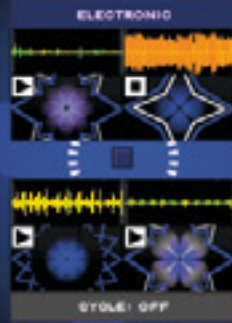


This dissertation presents four interactive audiovisual projects by Video Jack, a duo composed of Nuno N. Correia and André Carrilho. The projects are: *Heat Seeker* (2006), *AVOL* (2007), *Master and Margarita* (2009) and *AV Clash* (2010). The three last works have adopted an Interactive AudioVisual Objects (IAVO) approach, consisting of the integration of sound, audio visualization and graphical user interface into modular units. The projects have been developed with a crossmedia perspective, ranging from performance to installation and net art, and the study emphasizes the last area. The conclusions relate to audiovisual content, interaction design and user experience. The IAVO approach is presented as a path to create projects for integrated audiovisual art that are coherent, flexible, easy to use, playful and engaging to experience.

**Interactive
Audiovisual
Objects**

Nuno N.
Correia

Aalto-DD 21/2013



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Interactive Audiovisual Objects

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Summary

This dissertation studies four projects combining visuals, sound and interactivity by the author and André Carrilho (under the name Video Jack). The aim of the study is to create web-based interactive audiovisual art projects for integrated and simultaneous manipulation of sound and motion graphics, in a way that is coherent, flexible, easy to use, playful, and engaging to experience. From this study aim, three major research topics emerge: content, interactivity and experience.

The four projects included in the study are: *Heat Seeker* (2006), *AVOL* (2007), *Master and Margarita* (2009) and *AV Clash* (2010).¹ The three last projects have adopted an Interactive AudioVisual Objects (IAVO) approach, introduced in this study, consisting of the integration of sound, audio visualization and Graphical User Interface (GUI). Following this approach, GUI elements are embedded in the visuals, and aesthetically integrated with the animation style and with the overall visual character of each project. These projects have been developed with a cross-platform perspective (performance, net art, non-interactive video, soundtrack and exhibition), and the study focuses on the net art versions.

The methodology for the dissertation is practice-based research, complemented by a user study. The background and motivation for the work are presented, and the projects are contextualized with related works. The study is framed within the field of audiovisual art, and connections are established between the projects and related concepts. The combination of audio, visuals and interaction is discussed.

The conclusions are grouped around six topics: content, interactivity, experience (the main research topics), project management, methodology, and future developments. Strengths and weaknesses detected in the projects are analyzed, taking into account the results of the user study. These are followed by more generic conclusions that aim to provide useful contributions to the field of interactive audiovisual art.

¹ The projects can be accessed from: <http://www.videojackstudios.com>

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During these years, I have performed and presented my projects in several festivals and events. I would like to express my gratitude to all the event organizers, curators, promoters, bloggers, audiences and fellow artists, for the opportunity to show my work, and also for the constructive discussions (offline and online). I would also like to thank the institutions who have provided me with the funding that supported this work: Portugal's Fundação para a Ciência e Tecnologia and Aalto University, School of Arts, Design and Architecture. Additionally, I would like to thank the Institute of Informatics of Tallinn University for hosting me as a guest researcher.

Finally, I would like to thank my parents for their constant support and encouragement.

Helsinki, January 2013

Nuno N. Correia

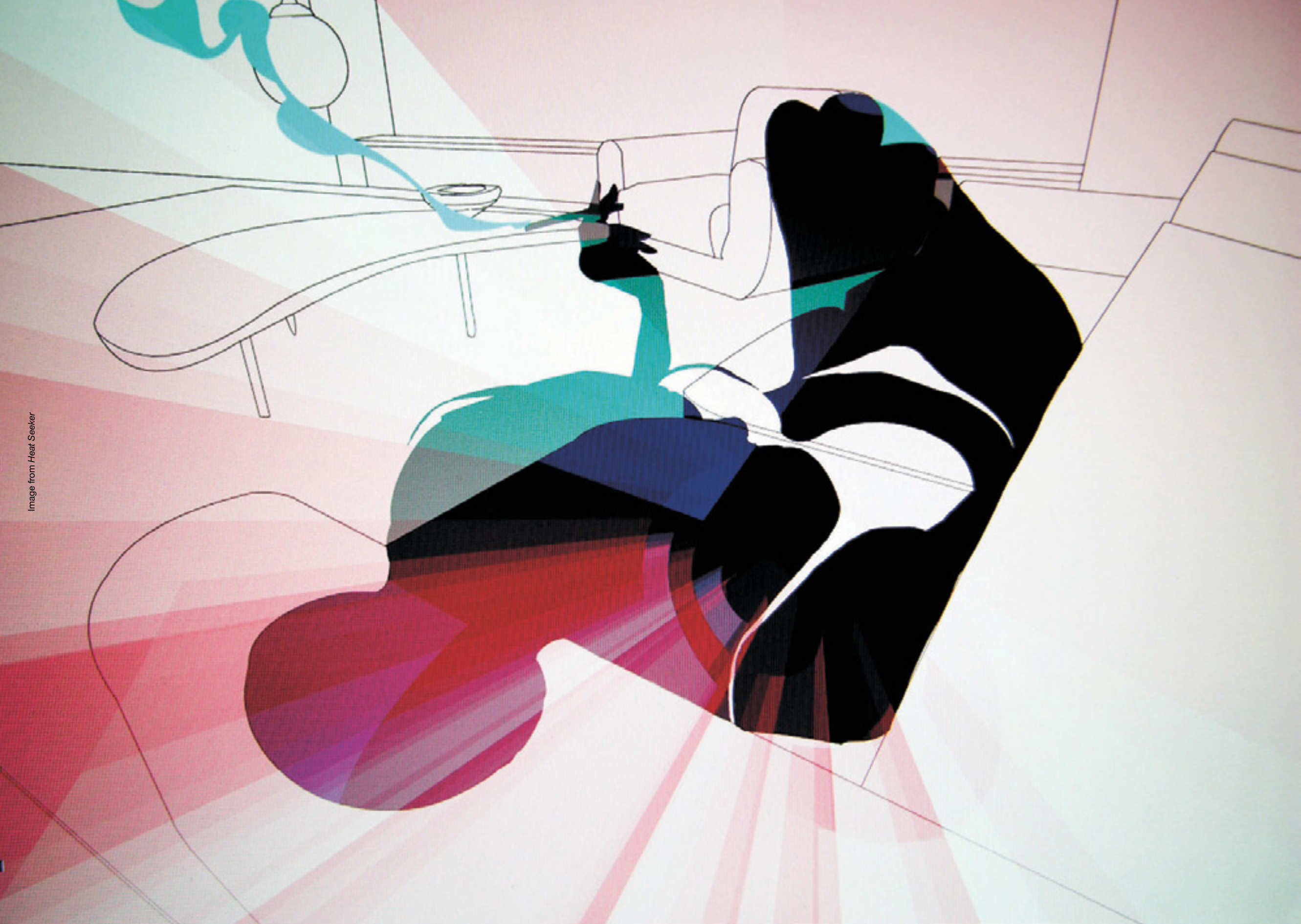
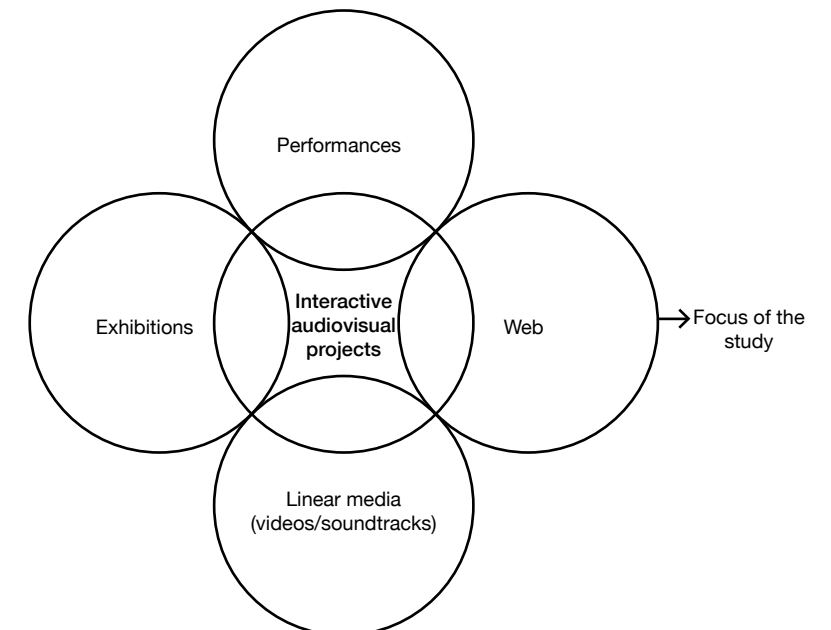


Image from Heat Seeker

“To remove the barriers between sight and sound, between the seen world and the heard world! To bring about a unity and a harmonious relationship between these two opposite spheres. What an absorbing task! The Greeks and Diderot, Wagner and Scriabin – who has not dreamt of this ideal? Is there anyone who has made no attempt to realize this dream?” (Eisenstein 1986)

This dissertation studies four projects combining audio, visuals and interactivity that I have developed with visual artist André Carrilho. We have released these projects under the alias “Video Jack”. The aim of the study is to create web-based interactive audiovisual art projects for integrated and simultaneous manipulation of sound and motion graphics, in a way that is coherent, flexible, easy to use, playful, and engaging to experience. The projects developed in the scope of the study were: *Heat Seeker* (2006), *AVOL* (2007), *Master and Margarita* (2009) and *AV Clash* (2010). The projects have been developed with a cross-platform perspective, having been presented in the following formats: performance, net art, non-interactive video, soundtrack and exhibition (exhibited as interactive installation in the case of *AVOL* and *AV Clash*; as video screening in the case of *Heat Seeker*; *Master and Margarita* has not been presented as exhibition). This study focuses on the net art versions of the projects, although some aspects relative to the other platforms will also be discussed (Figure 1). An online questionnaire was conducted to evaluate these net art projects, with an emphasis on the latest one, *AV Clash*, and excluding *Heat Seeker*.

Figure 1. Platforms used by Video Jack projects



The projects developed in the scope of this study can be framed within a cultural context characterized by numerous changes in music and audiovisual art: increasing importance of visual content in association with music (a major topic for the dissertation), particularly from the 1980s since the launch of MTV (Austerlitz 2008, p.31), and the ascendance of the VJ (Video Jockey) in the club culture of the 1990s; audience interest in participatory engagement with music; the increasing significance of the Internet as a distribution channel for audio and audiovisual media; and the pervasiveness of audio and visual remixes (Figure 2).

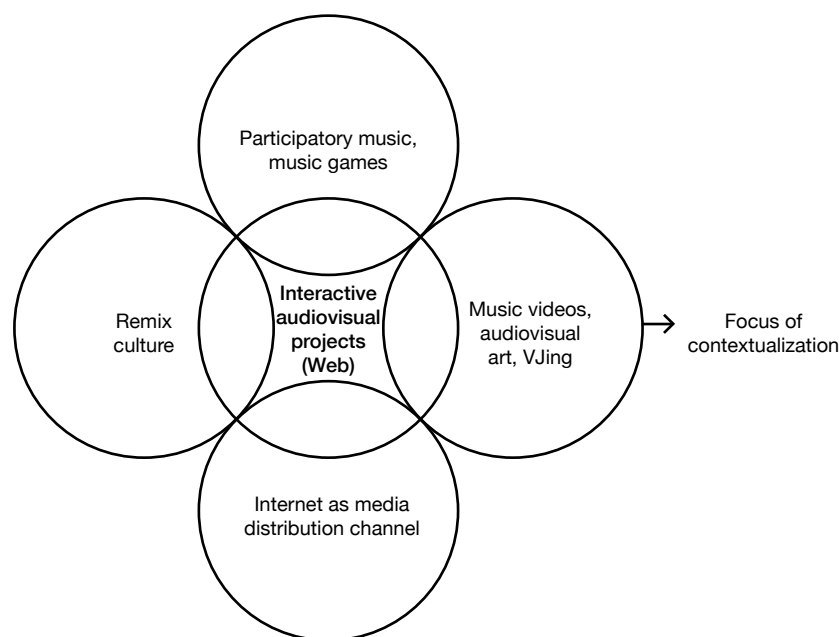


Figure 2. Cultural context of the study

The interest in participatory engagement with music can be exemplified by the popularity of music games such as the *Guitar Hero* series, the third most influential game of the past decade according to *Wired* magazine (Kohler 2009). Another example is the work of *RjDj* creator Michael Breidenbrucker, who believes that games and music “might become the same thing at one point”, adding that “a lot of music is done as software, so why not release it as software?” (Geere 2011).

As demonstration of the increasing importance of the Internet as distribution channel for music, more than 660 million digital songs were sold in the first semester of 2011 in the USA, an 11 percent increase from the first half of 2010 (Empson 2011). The Internet has also become “a superb music video resource” (Austerlitz 2008, p.viii).

Audio and visual remixes have become so pervasive that it has become commonplace to state that we live in a remix culture (Manovich 2002a, p.2). Basic media manipulation tools that facilitate remixing have become mainstream and are often pre-installed in the latest personal computers. The emergence of YouTube and other online repositories of video

and audio have allowed a vaster audience to distribute these remixes. Increasingly, we want to be creators, not simply consumers, as Genevieve Bell states: “having a voice has never been more important” (Bell 2012). Shamma and Shaw identify two types of models of creative practice: the creator-centric models, which “seek to describe a space of possibilities for creators to explore and to prescribe a method for undertaking that exploration” (2007, p.276), and the experienter-centric models, where the focus is “on the experience of the viewer as a piece of art reveals itself” (2007, p.277). They argue that “new media arts and technologies provide opportunities for mixing previous models of creativity to obtain new ones” (Shamma & Shaw 2007, p.277), and that new media is questioning the boundaries between creator-centric and experienter-centric models. As an example of this, they refer “the production of media intended for active remix and reuse by others” (Shamma & Shaw 2007, p.277), conflating the role of the creator and experienter. They propose to seek new models in which the user of a creative work “takes on a generative role, not just an interpretive or interactive one” (Shamma & Shaw 2007, p.277).

1.1 Structure of the dissertation

This dissertation is composed of two parts: the introductory section and the set of publications. The first part consists of the following three chapters:

- **1. Introduction** – presents an overview of the aims of the dissertation and an initial cultural contextualization; the methodology adopted for this study (practice-based research, complemented by a user study); the projects that were developed in the scope of the study; the publications that are included; and the background and motivations behind the work.
- **2. Contextualization** – frames the study within the field of audiovisual art, and establishes connections between the projects and related concepts.
- **3. Conclusions** – reviews the main findings of the dissertation. The key findings are organized according to the research questions and research topics identified in section 1.2, including paths for future developments. These are followed by more generic conclusions that aim to provide useful contributions to the field of interactive audiovisual art.

The publications included in the second part are briefly presented in section 1.4.

1.2 Research questions and topics

The main research question of the study is:

- How to design interactive audiovisual art projects for the web, allowing for the integrated and simultaneous manipulation of sound and motion graphics, in a way that is coherent, flexible, easy to use, playful, and engaging to experience?

This main research question stems from a more abstract one: how to allow for an active participation of audience members in audiovisual art projects, narrowing the divide between audience and artist? Three major research topics can be extracted from the main research question: content (the audiovisual building blocks and the relationship between them), interactivity (related to flexibility, meaning the possibilities for media manipulation, and ease of use) and experience (associated to all of the previous topics, but related particularly to playfulness and engagement). The main research question raises further, more specific, secondary questions related to content and interactivity in audiovisual projects:

1. How to combine sound and visuals so that they are in mutual agreement, and create new meaning, generating added value?
2. How can a GUI (Graphical User Interface) be effectively integrated with the visual content, creating a unified experience?
3. How to balance amount of functionalities and ease of use, in order to achieve both playfulness and creativity?

The answer to these secondary questions will provide further insights into the main research question. In the course of the present study, other research topics have become important for me, related to project management. They do not stem directly from the main research question, but contribute to the successful development, diffusion and documentation of the projects. Connected to these aspects, five sub-topics have emerged within project management – project spin-offs, promotion, documentation, technology and copyright – raising the following additional secondary questions:

4. How to spin-off an interactive audiovisual project into different platforms, maximizing its reach?
5. How to promote an interactive audiovisual project and its spin-offs?
6. How to document the projects, and leverage that documentation to further engage the users?

7. Was the technology used to develop the projects effective?

8. What kind of copyright framing is adequate for the projects?

Continuing to reflect upon the process, but shifting to the theoretical side, another secondary question emerges:

9. Was the methodological approach appropriate?

Finally, a secondary research question regarding future developments is raised:

10. What important future developments are identified, taking into account gaps left out by the projects, and emerging trends and technologies?

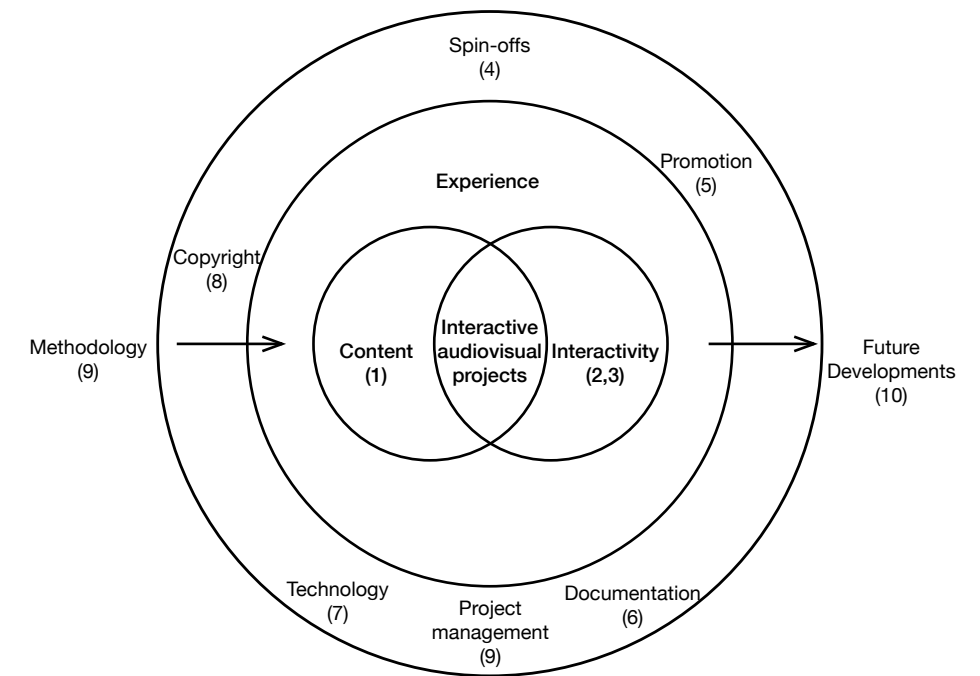


Figure 3. Research topics, with reference to respective secondary research questions

Figure 3 provides a visualization of the different research topics, emphasizing the ones closer to the main research question: content, interactivity and experience. Each topic is matched with the respective secondary research question (the corresponding number is in parentheses).

The methodology adopted for the present study is practice-based research, since it is “an original investigation undertaken in order to gain new knowledge partly by means of practice and the outcomes of that practice” (Candy 2006, p.1). In practice-based research, “the creative artifact is the basis of the contribution to knowledge” (Candy 2006, p.1), and that is the case with the artistic projects that have been developed in the scope of this study. It is research through practice, since “art or design practice is the vehicle of the research, and a means to communicate the result” (Yee 2010, p.3).

The practice-based research undertaken followed a project development path. The four projects were developed on an iterative basis: each project aimed to address weaknesses or development opportunities I had detected in the previous one. This iterative aspect of the present study is one of the characteristics of practice-based research, and a criteria for its trustworthiness according to Rolling, since “iterative validity in arts-based research might invoke the self-similarity of variations on a concept over time” which relates to “the serial nature of artmaking” (Rolling 2010, p.110). The project development path I have created, composed of projects developed iteratively, oscillating between narration and abstraction, is meant to enable comparison between the different projects – both between the abstract and narrative ones, and also within each of these series (since there are two narrative projects and two abstract ones).

Rolling’s concept of iterative validity is related to his concept of interpretative validity in arts-based research, which “might invoke each of the multiple readings within a research study to serve as a criterion for trustworthiness” (Rolling 2010, p.110). Those multiple readings, over different projects that represent iterations within a continuous path, are sought in the present research with the aid of a user study. Therefore, the artworks are seen not only from my own interpretation, but also from the perspective of users, and therefore various interpretations are sought – “interpretive strategies are born of the multivariate origins that comprise a work of art” (Rolling 2010, p.110).

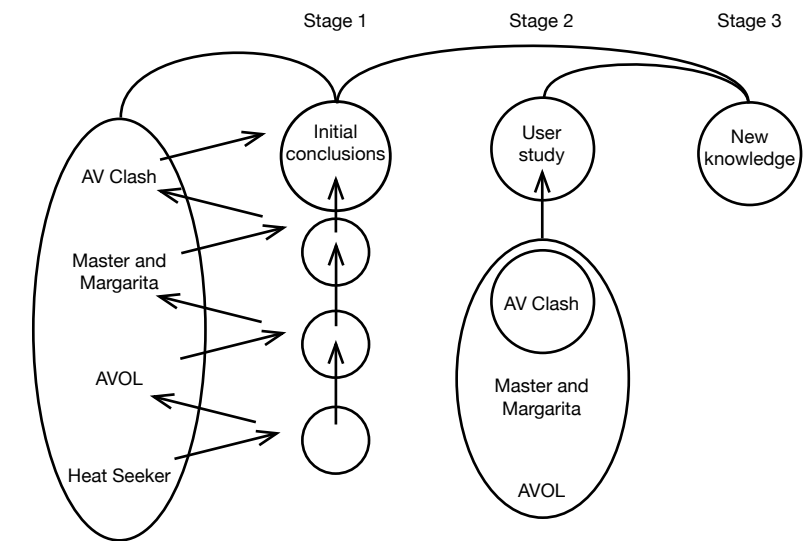


Figure 4. Visualization of the practice-based research

The practice-based research has been complemented by a user study, aiming to assess if my initial conclusions as designer and user of the projects were shared by other users. Therefore, the objective of the user study was to allow for an external perspective on the projects, and gain new knowledge regarding my practice (Figure 4). The aim of the user study was not to achieve statistical validity or generalization, but to obtain new insights into my practice, insights that would be useful for me and other practitioners or researchers delving into the subject of interactive audiovisual art. It also aspired to check for any particular problems or successes regarding content, interactivity and experience (the main research topics, as presented above); and identify opportunities or undesirable areas in the project development path – possible areas of interest that might be missing, and areas that may seem uninteresting for users.

The user study was based on an online questionnaire composed of open and close-ended questions. The questionnaire focused on the last project developed in the scope of the study, *AV Clash*, but also included comparison sections with preceding projects *AVOL* and *Master and Margarita*. It was composed of 81 questions, mostly close-ended, but also including 13 open-ended ones distributed throughout all the sections of the questionnaire. This follows Gray & Malins recommendation to “always take the opportunity to seek clarification/extension on a simple answer by including a ‘further comments’ section” in a questionnaire (Gray & Malins 2004, p.119). Therefore, the design of the questionnaire followed a logic of gathering quantitative and qualitative

data by having “predetermined response options for several questions, followed by a set of open-ended questions written to illuminate some aspect of the phenomenon under study” (Teddlie & Tashakkori 2009, p.235). The majority of the close-ended questions consisted of five-point Likert scales.

The questionnaire was answered by 22 anonymous respondents. Its length may have intimidated some potential users, and may have induced “questionnaire fatigue” on the respondents. Still, the option for designing a longer questionnaire allowed for the collection of data on a large variety of topics, regarding three different projects. A larger, more open and more diverse range of opinions was collected than would be possible to gather (with a reasonable amount of resources) through other more qualitative-focused instruments, such as interviews. Opinions gathered with such instruments would have been more detailed and expressive, since “surveys with both open-ended and close-ended questions provide a minimal qualitative database because of the short open-ended responses” (Creswell & Clark 2010, p.276). However, despite its weaknesses, I consider that the web questionnaire was an adequate research instrument: it matched well the online nature of the practical research work; the respondents were geographically diverse; and the questionnaire was visible and open at anytime (within the period of six weeks that it was online) to any participant who would have visited any of Video Jack’s websites.

I decided to base the user study on an online questionnaire because researchers should choose a methodology design “that matches the problem and research questions” (Creswell & Clark 2010, p.61). An online questionnaire seemed to be an adequate format for evaluation, given that the project is web-based, and the audience of the project is global. A link to the questionnaire could be found alongside a link to the projects in the different Video Jack web pages. The questionnaire mirrors the projects to a certain extent: they could all be visited at anytime, anywhere, by anyone with an Internet connection. Therefore, both the projects and the questionnaire were, to the same extent, free of time and space limitations.

The design of the questionnaire was particularly influenced by recent texts regarding experience-focused approaches to human-computer interaction. The questions were grouped mainly into sections focusing on the core research topics of the study: content, interactivity and experience. There was also an initial section aiming to characterize the respondent and a final one related to future developments. The sixth and seventh articles in this dissertation are related to the user study and delve more in detail into the design of the questionnaire. The complete questionnaire is included in Annex 4 of the dissertation. A summary of the answers is presented in Annex 5.

The study contains abundant web links to texts, stills and audiovisual documentation (such as project presentations, discussions, media reviews, and interviews), inspired by the approach of Idunn Sem. Sem decided to rethink the traditional, written thesis-format “out of a strong sense of inadequacy when practice-based method is performed”, and thus “applied the multimodal potential or feature of the web-format to avoid some of the potential loss and inconvenience of translating stills and audio visual material into print” (Sem 2006, p.129). My approach was less ambitious than Sem’s, leaving these multimodal web links mostly for Annex 2 of the dissertation.

1.4 Publications and practical work

This dissertation includes seven publications, studying the net art projects *Heat Seeker*,² *AVOL*,³ *Master and Margarita*⁴ and *AV Clash*⁵ (these four will also be referred to as “Video Jack projects”). All the publications have been peer-reviewed based on publication-ready manuscripts.

1.4.1 Publications

The first four articles present the development of each of the four projects (one article per project), in a path towards fulfilling the aims of the study, focusing on the web versions but also mentioning other formats of the projects. These four articles follow a practice-based research line of inquiry. In these articles I contextualize each project with related works; discuss its design; situate it within the broader research path; assess how effective the project has been in fulfilling its aims, as author and user; while also pointing directions for future developments. All these four articles analyze the final projects, except the fourth article, which focuses on the beta version of *AV Clash*. Some features were changed in the final version of this project, as described on the sixth and seventh articles.

The next article (fifth) analyses in depth the content of *Master and Margarita*, and the relations between music, image and the book it adapts. The last two articles analyze the results of the online questionnaire, and assess if the respondents confirm my early conclusions in the first four articles. The first of these two articles (sixth) focuses on the sections of the questionnaire related exclusively to *AV Clash*. The last article (seventh) focuses on the sections of the questionnaire comparing *AV Clash* with *AVOL* (the fewer questions comparing *AV Clash* with *Master and Margarita* were left out of the paper), and also the section related to paths for future development. A list of the seven articles is presented next, followed by a figure (Figure 5) illustrating the relation between the four projects and the articles.

² <http://www.videojackstudios.com/heatseeker/>

³ <http://www.videojackstudios.com/avol/>

⁴ <http://www.videojackstudios.com/masterandmargarita/>

⁵ <http://www.avclash.com/>

1. Correia, N.N., 2010. Heat Seeker – An Interactive Audio-Visual Project for Performance, Video and Web. In *Proceedings of IADIS Visual Communication Conference 2010*. Freiburg, pp. 243-251.

2. Correia, N.N., 2012. AVOL – Towards an Integrated Audio-Visual Expression. *Journal of Visual Art Practice*, 10(3), pp. 201-214.

3. Correia, N.N., 2011. Master And Margarita – an Audiovisual Adaptation of Bulgakov's Novel for the Web and Performance. In *Proceedings of Academic MindTrek 2011*. Tampere, pp. 317-319.

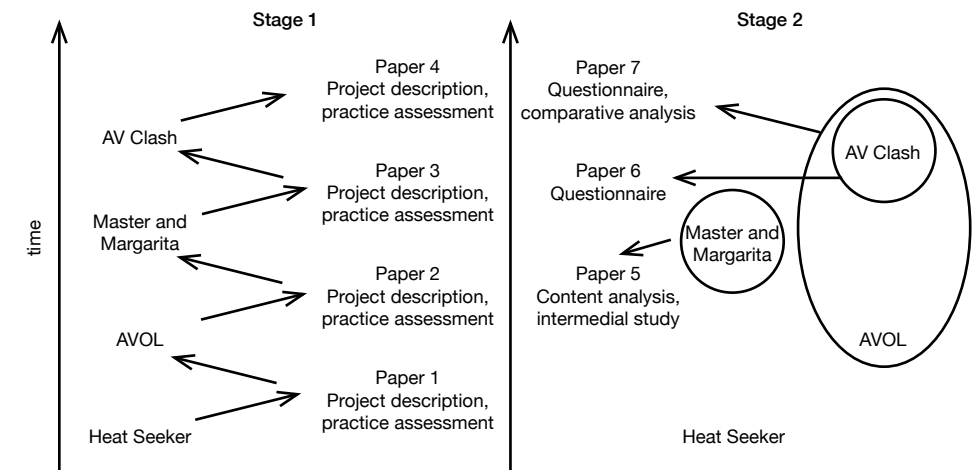
4. Correia, N.N., 2010. AV Clash – Online Tool for Mixing and Visualizing Audio Retrieved from Freesound.org Database. In *Proceedings of Sound and Music Computing Conference 2010*. Barcelona, pp. 220-226.

5. Correia, N.N., 2012. Master and Margarita: From Novel to Interactive Audio-visual Adaptation. In L. Eilittä, ed. *Intermedial Arts: Disrupting, Remembering and Transforming Media*. Newcastle upon Tyne: Cambridge Scholars Publishing, pp. 127-146. (Published with the permission of Cambridge Scholars Publishing)

6. Correia, N.N., 2011. AV Clash, Online Audiovisual Project: A Case Study of Evaluation in New Media Art. In *Proceedings of the 8th International Conference on Advances in Computer Entertainment Technology (ACE)*. Lisbon.

7. Correia, N.N., 2012. Paths in Interactive Sound Visualization: From AVOL to AV Clash. In *Proceedings of Sound and Music Computing Conference 2012*. Copenhagen, pp. 326–332.

Figure 5. Relationship between papers and projects, in two stages of the study



The last three projects, *AV Clash*, *Master and Margarita* and *AVOL*, are object of a deeper analysis, as they are targeted by a larger number of papers (as seen in Figure 5). *AV Clash* is particularly focused, as it is the latest project, and it can be seen as the culmination of the study.

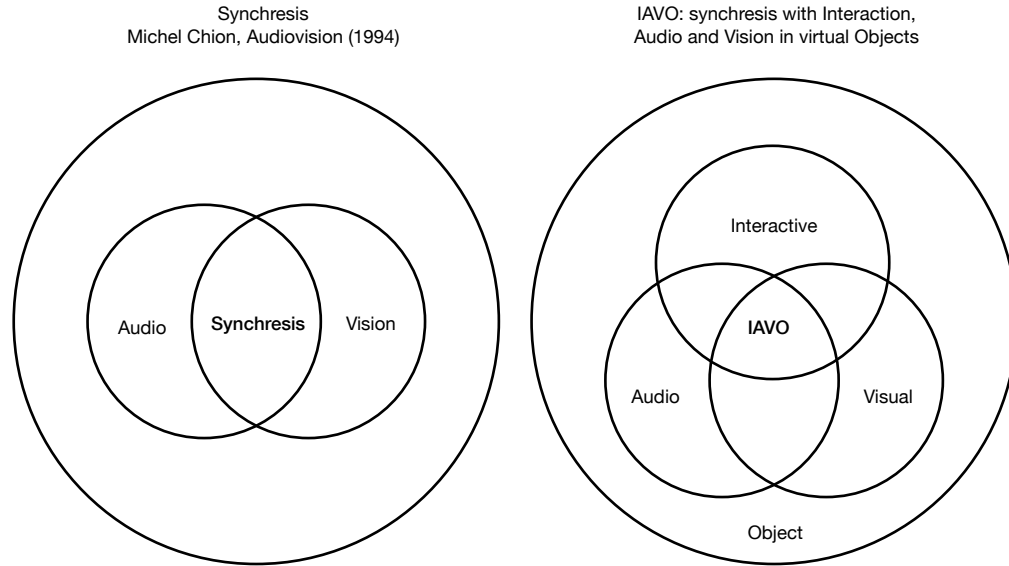
1.4.2 Interactive AudioVisual Objects (IAVO) approach

The three latest projects (*AVOL*, *Master and Margarita* and *AV Clash*) share the same approach of integrating GUI with sound visualization, with different degrees of complexity in each of the projects. The development of this approach has led to the concept of Interactive AudioVisual Objects (IAVOs), implemented in the three projects. IAVOs are meant to be modules that form a cohesive whole, where the GUI is embedded and aesthetically integrated in the visualizations.

The synchronization between audio and visuals is ensured via an algorithm that manipulates the visuals based on the analysis of the audio. IAVOs follow a similar logic to “tracks” or “mixer strips” in digital audio workstations (DAWs; for example, the open-source Ardour)⁶. Both control a determined sound source and allow it to be mixed with others, and mixer strips usually have peak meters to visualize the audio signal. However, graphically they are very different: the GUI in DAWs usually emulates, more or less closely, hardware sound mixers, whereas the GUI in IAVOs follows the graphical style of the sound visualization. Additionally, the sound visualizations in IAVOs aim to be richer than the bar graphs in DAWs – they aim to be subjective interpretations of sounds or categories of sounds, where the image adds new meaning to the sound and vice-versa.

⁶ http://en.flossmanuals.net/ardour/ch037_using-the-mixer-strip/

Figure 6. A visualization of the concept of synchresis (left) and of IAVO (right)



The concept of IAVO is influenced by Michel Chion's notion of synchresis (Figure 6), which means "the forging of an immediate and necessary relationship between something one sees and something one hears at the same time" (Chion 1994, p.224), and aims to add interaction to that fusion of audio and visuals. Synchresis is further discussed in chapter 2. The three IAVO projects (the latest three) follow an audiovisual composition approach, since they treat "sonic and visual events as a single perceptual unit" (Grierson 2007, p.2), while adding interactivity to that unit. The notion of IAVO also relates to Bergstrom's *Soma*, which is also tri-modal: "music is performed alongside congruent visuals, involving performers that employ highly advanced embodied motor knowledge in their performance" (Bergstrom 2011, p.26). In the IAVO projects developed so far, however, the embodied component is less explored than in *Soma*. The notion of IAVO is also closely related to the concept of Audio-Visual Objects by Kubovy and Schutz, which they define as "cross-modal experiences" that share a strong auditory and visual binding – an "audio-visual linkage" (Kubovy & Schutz 2010). The use in my research of the term "object" is influenced by Manovich's concept of "new media objects", which he considers to represent, or help construct, an outside referent: "a physically existing object, historical information presented in other documents, a system of categories currently employed by culture as a whole or by particular social groups" (Manovich 2002b, p.15). In the case of IAVOs, the outside referent is open to interpretation. My own interpretation is that IAVOs are players and dancers of a virtual band, each playing their own sound/instrument with an accompanying "movement" to that sound, in a virtual stage that is the computer screen.



Figure 7. Screenshot from *Heat Seeker*

1.4.3 Projects

Heat Seeker (2006; web version 2009) follows a figurative approach to visual music, aiming to reach engagement by combining songs with multi-layered narrative animations. Each song has a correspondent “interactive music video”. The narratives of the different “interactive music videos” are not connected, although they share a similar visual style. Small draggable animations are important elements of the visuals, and are the embryo for the IAVOs in the following projects. Unlike the other online projects, in *Heat Seeker* only the visuals are interactive – each of the ten songs in the project plays linearly from beginning to end (Figure 7).

AVOL (2007) aims to integrate visual and sonic manipulation in the same environment, by introducing the concept of IAVOs – “objects” that combine animations visualizing sound with a GUI to control the respective sound and visuals. There are seven IAVOs in *AVOL*, each containing four combinations of sound and visuals. *AVOL*, unlike *Heat Seeker*, has an abstract visual style (Figure 8).

AVOL was the first of our web-based projects, aiming to break down the barrier between audience and artists – by providing access to our audience, via the web, to software we would also use in performances. *Heat Seeker* would only later have an online version, inspired by *AVOL*.

Figure 8. Screenshot from *AVOL*



Master and Margarita (2009) is a return to the figurative style of *Heat Seeker*, but aiming to integrate the IAVO logic of *AVOL* with a narrative element. It also aims to achieve a more coherent integration of sound and visuals and a more engaging experience by adapting a novel – *The Master and Margarita*, by Mikhail Bulgakov (Figure 9)

Figure 9. Screenshot from *Master and Margarita*

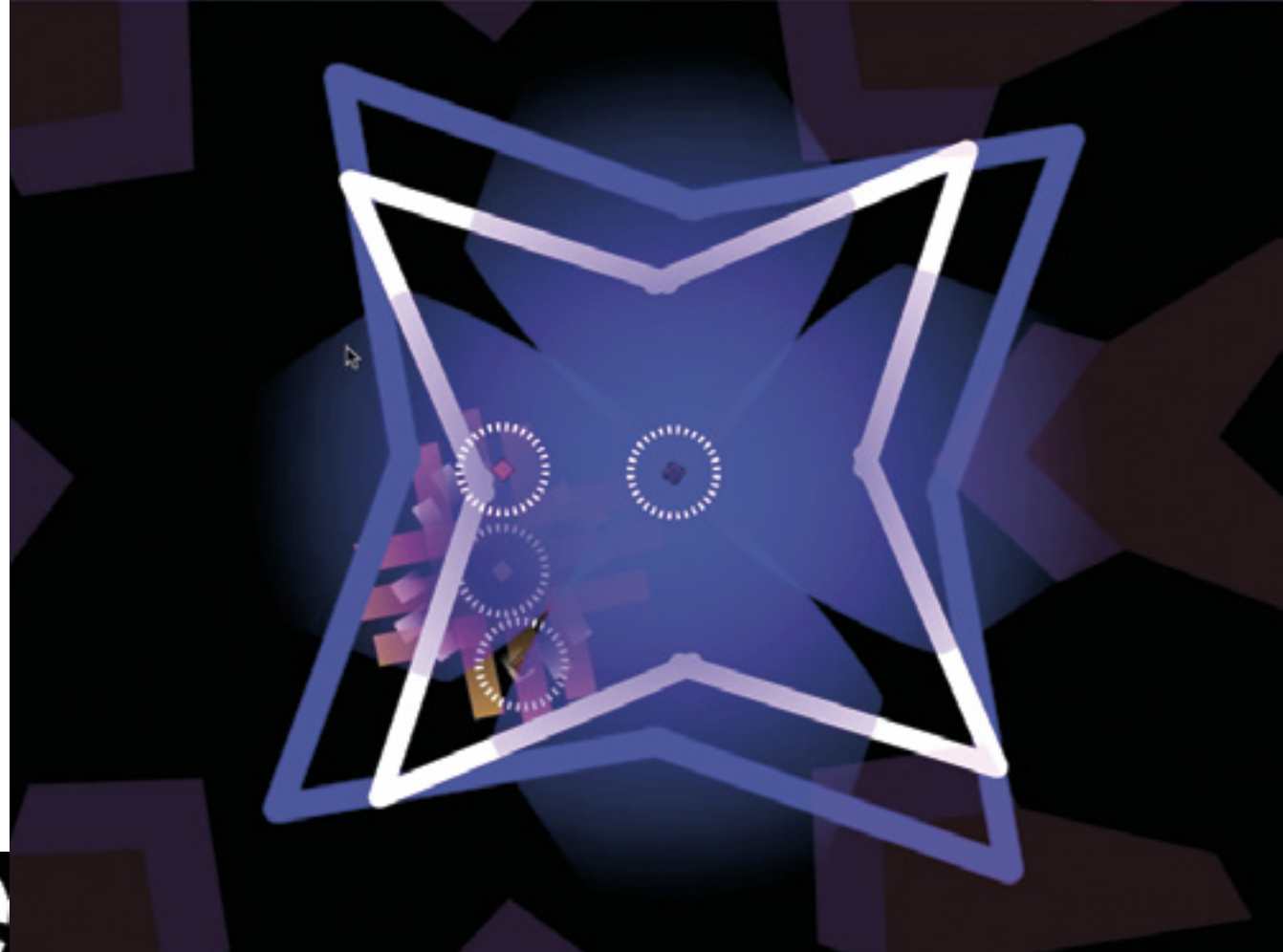
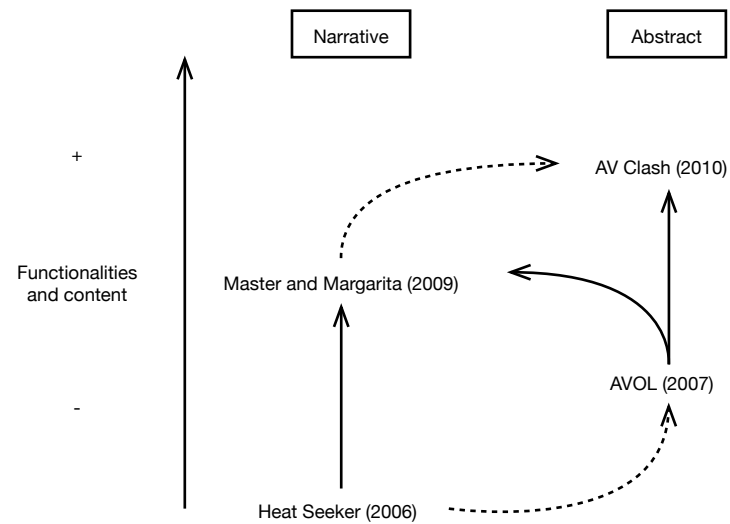


Figure 10. Screenshot from *AV Clash*

AV Clash (2010) intends to solve some of the insufficiencies detected in *AVOL*: a limited amount of sounds and visuals, and a lack of audio manipulation options. To increase the amount of content, *AV Clash* retrieves sounds from an online sound database, *Freesound.org*. It is the only project where the sonic side does not consist of music composed by me. Carrilho created a larger number of animations than in *AVOL*, and audio manipulation options (such as audio effects) were added. Other improvements were attempted relatively to *AVOL*, in terms of playfulness and ease of use. Still, the project follows the same abstract visual style and IAVO logic of *AVOL*, although the number of “objects” was reduced to four, as in *Master and Margarita* (Figure 10).

The four projects have been presented in more than 20 international new media arts festivals and exhibitions, in 16 countries (see Annex 1). Documentation relative to these presentations can be found on our main website⁷ and related sites (see Annex 2 for a guide to our web presence). Figure 11 summarizes the evolution of the projects.

⁷ <http://www.videojackstudios.com>



In these projects, I was responsible for project management, programming, music (except *AV Clash*, which relies on sounds from Freesound.org), documentation (including project videos) and promotion. Additionally, I developed the script for *Master and Margarita*. Carrilho was responsible for the visual design and animation of the projects. Both of us developed the project concepts and interaction design. There was mutual feedback and influence regarding our own specific fields: André would comment on the programming and music, and I would comment on the visuals. Gokce Tasikan joined the team for *AV Clash* and did most of the programming on the project, assisted by me.

The implementation of the IAVO approach in each project is distinct. The GUI in IAVOs within the projects have different degrees of complexity. IAVOs in *Master and Margarita* contain a lesser amount of GUI elements, whereas in *AV Clash* the GUI is more complex, split into two views to accommodate all the different interface options: a normal "front" view and a settings "back" view (Figure 12).

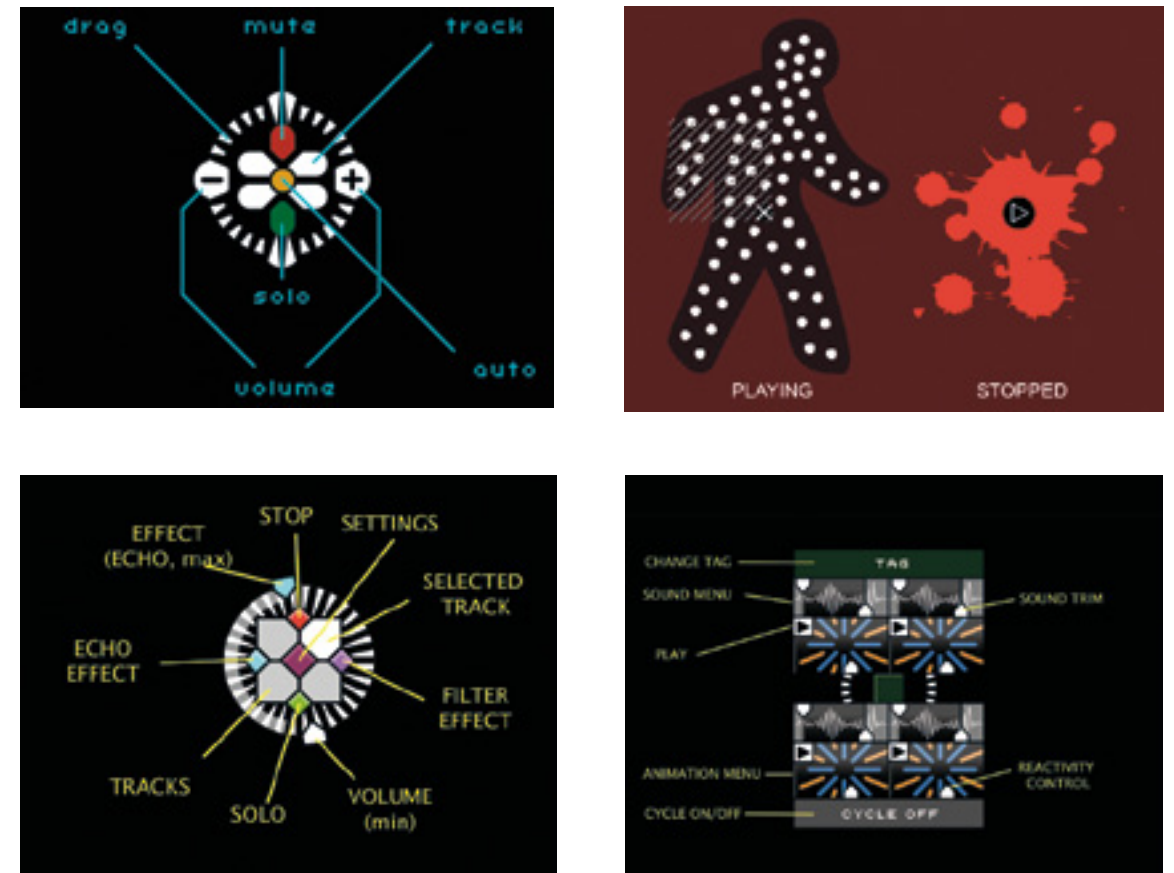


Figure 12. IAVO GUI in *AVOL* (top left), *Master and Margarita* (top right, playing and stopped views) and *AV Clash* (bottom; "front" view on the left and "back" view on the right)

AVOL contains seven IAVOs, while *Master and Margarita* and *AV Clash* contain four. These IAVOs allow access to combinations of sounds and audio-reactive visuals. In *AVOL*, 28 sounds are accessible, while in *Master and Margarita* 36 sounds can be triggered. Approximately 240 sounds can be played in *AV Clash* – the project retrieves approximately 20 sounds per each of the 12 tags accessed from Freesound.org. It must be noted that in *Master and Margarita* the sounds are not as interchangeable as in the other two projects, as the sounds are distributed in chapters and cannot be combined across different ones (four sounds are included in each of the nine chapters). In *AVOL* and *Master and Margarita*, the number of audio-reactive visuals is the same as the number of sounds, whereas *AV Clash* contains 96 audio-reactive visuals – eight per each of the 12 tags (Figure 13).

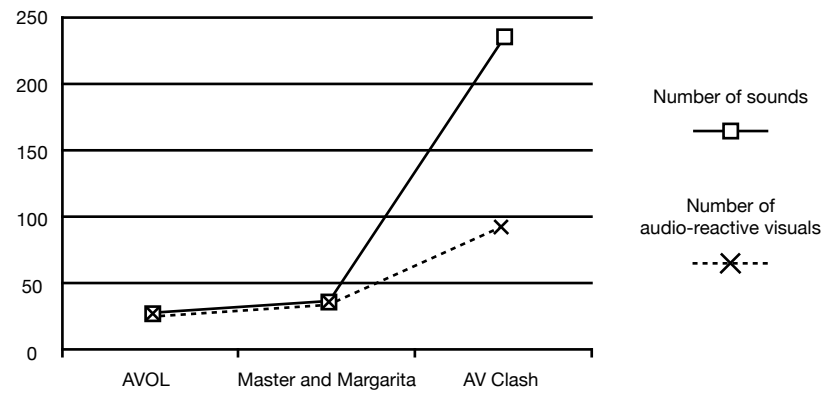


Figure 13. Sounds and audio-reactive visuals accessible via IAVOs in each project

Unlike the other two projects, *Master and Margarita* also contains visuals that are not audio-reactive (accessed outside of the IAVOs). The IAVOs in the three projects differ substantially in terms of the sound manipulation capabilities they offer: start, stop, solo and volume in *AVOL*; star, stop and volume in *Master and Margarita*; and start, stop, solo, volume, effects, sound trim, cycle sounds and change tag in *AV Clash*.

1.4.4 Web integration

With the release of the online version of *Heat Seeker* in 2009, the release of *Master and Margarita* later on the same year, and the planned release of *AV Clash* the following year, I decided in 2009 to redesign the Video Jack website, in order to emphasize online projects and project documentation. The main objectives of the new website were: to have a common entry point to the online projects, and to highlight their spin-offs (such as project videos, documentation of performances and exhibitions). The new website showcases the main Video Jack projects on the home page, with a link to immediately access the online version. A link to an explanatory page about each project is also provided (Figure 14). These explanatory pages embed and/or link to related media (images, videos, music).

Figure 14. Screenshot of the Video Jack homepage (left), and of a project page (right)



A documentation section for Video Jack presentations (performances and exhibitions) was also added, including photos and videos (Figure 15).⁸ Navigation using tags relative to each of the projects allows seeing all pages related to a project (for example, synopsis of the project, music, documentation of events and press). The website also connects to Video Jack social networking websites (such as Facebook, Twitter and Google+). The new website was designed by Carrilho and me, programmed by Gokce Taskan and its content is managed by me.

Figure 15. Screenshot of the Video Jack events documentation page (left), and of a specific event page (right)



1.5 Background, motivation and related work

1.5.1 Early interest in music and programming

My background as musician started in 1989, when I studied guitar at the Jazz School of Porto. In 1991 I attended a theatre course, which led me to be involved in the technical side of performance arts as sound designer between 1991 and 1993. During that period I was also actively involved in the Portuguese comic book and illustration scene, as co-editor of the magazine *Quadrado* and co-organizer of the Porto International Comic Books Festival. Additionally, I was DJing regularly in Porto between 1992 and 1993. In 1998, after a pause in my artistic activity, and motivated by evolutions in digital audio, I set up a computer-centered home studio. Between 1999 and 2001 I composed three electronic music soundtracks for Portuguese theater groups. In 2000 I released my first CD, essentially a collection of songs from these soundtracks. For the next step, I wished to compose

⁸ <http://www.videojackstudios.com/c/events/>

music and present it on stage without the pretext of a theatre soundtrack. I had my first music performance in 2002, playing with my laptop and with additional performers (a trumpet player and two percussionists). Despite the presence of the additional musicians, I was not pleased with my first experience as laptop music performer. I felt that there was a lack of perception from the audience regarding what I was doing behind the laptop screen, and that the performance was not sufficiently engaging.

Parallel to this musical (and to a lesser extent, related to comic books and theatre) narrative, there is another relevant one, related to my path as computer programmer. I first learnt programming in 1984, aged 11, after having been offered a Sinclair ZX Spectrum and two BASIC programming courses by my parents. After a couple of years, the interest in programming and gaming faded, replaced by a progressive involvement in music, comic books and theater in my teenage years. However, the interest in programming resurfaced briefly in the early 1990s at university, where I took a few Information Technology courses. At that time, I bought my first Macintosh, and became fascinated by the possibilities of software such as MacroMind Director, and by the emergence of the World Wide Web, the Mosaic browser and HTML. I also went briefly back into gaming, captivated by the multimedia capabilities of CD-ROMs. Among the titles I bought at the time were *Myst*, Peter Gabriel's *Xplore 1* and *The Residents: Freak Show*, which would be influential for my future work. Buying a more powerful computer in 1998 for musical purposes would renew my interest in programming and multimedia development, and I took a few courses in Director and Flash in 2000. Shortly after, I started teaching programming and multimedia design at several universities in Lisbon.

1.5.2 Initial work with André Carrilho

These two main threads – music and programming – intersected when my friend André Carrilho and me decided to work together to develop visuals for my music performances. Carrilho is a versatile visual artist, with work mainly as illustrator and cartoonist, but also as animator, comic book artist and graphic designer. Following my first music performance in 2002, I wanted to add live visuals to my music presentations in order to create a more engaging experience for the audience. Carrilho showed interest in working with me in this area. Because of my past as editor and curator of comic books, the idea of creating visuals with an illustrator seemed particularly appealing. Initial discussions around the topic led us to believe that what we wanted to achieve was not suited to the commercial software available for live visuals, and that we should develop our own application. We decided to develop it using (then Macromedia) Flash, since we felt that this software was in an interesting intersection for us – between programming and animation. The applica-

tion, which we named *InGrid*, was developed during 2003 and early 2004. In February 2004, Carrilho and me had our first audiovisual performance with the application. The material presented in that performance would become the main content for the *Heat Seeker* project. Also in 2004, I wrote a paper about the application (Correia 2004). Seven more performances took place in Portugal between this first one and the release of the *Heat Seeker* CD/DVD in 2006.

In parallel to the *Heat Seeker* performances (at the time still under my music alias “Codem”), Carrilho and me decided to spin-off the visual application we developed, in order for it to be used with other musicians and DJs, and not just in my own music performances. We felt that the tool we had developed could be used in other contexts, provided that we would develop more visuals to be used with it. For this new field of work, we decided to use a different artist name, Video Jack. Video Jack is a play with words, between the literal video cable, the close association with the term “Video Jockey” or “VJ”, and an imaginary “Jack” character based on an S-Video connector, which became our logo. We presented a work proposal to Lux,⁹ one of the largest clubs in Lisbon, which was also using live visuals. It had multiple large screens spread out across two floors – a “bar” area and a dance floor area. Lux was a place we admired, as it had an artistic and exploratory approach to clubbing, with top international DJs performing every month. Our proposal was accepted, and we started working as resident VJs at Lux in April 2005,¹⁰ in a partnership that lasted two years, with two performances per month on average.

The residency at Lux allowed us to develop our visual style and to mature our coordination between visuals and music. It also brought about the development of a second tool for interactive visuals. We found that the attention-demanding narrative style pursued with *InGrid*, with its bright colors, while adequate to the bar floor, was not appropriate to the dance floor. In the dance floor, *InGrid* did not integrate well with the lighting design and the darker atmosphere. Additionally, *InGrid* visuals demanded constant manipulation to keep up its visual interest, which was tiring in our six-hour performances at Lux. Therefore, we also wanted a software that would be more automated and generative, requiring less interaction. The second interactive visuals tool, entitled *Bi0*, was based on abstract animation modules, which could be manipulated both generatively and interactively. The application was used mostly with a black background, in order to better integrate with the darker environment and the lighting. The abstract animations in *Bi0* were inspired by the smaller drag-and-drop animation modules in *InGrid*. *Bi0* would also later inspire the visual style of abstract Video Jack projects *AVOL* and *AV Clash*.

⁹ <http://www.luxfragil.com/>

¹⁰ Documentation of our residency at Lux: <http://www.videojackstudios.com/events/200504-200705-vjing-at-lux-lisbon/>

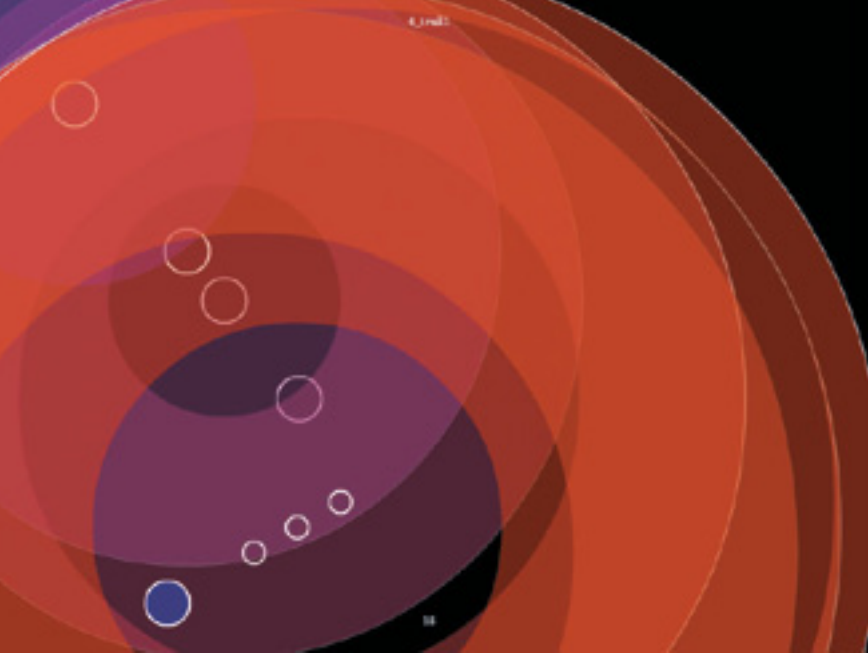


Figure 16. Screenshot from *Idiot Prince*

The video for *Idiot Prince*, one of the songs in the *Heat Seeker* CD/DVD, was recorded using part of the visuals in *Bi0*, and was also released as an interactive online version in 2006.¹¹ *Idiot Prince* was Video Jack's first attempt at net art, although a very simplistic one, with a small amount of content and visual manipulation options (Figure 16). The title is a reference to Dostoyevsky's novel that inspired the song, *The Idiot*, reflecting on my interest in Russian literature, which would be further explored in *Master and Margarita*.

A to Z was another project developed for live visuals in Lux during that time, to be used during performances by the Portuguese DJ duo with the same name. Differently from other Video Jack projects, *A to Z* was based on specially developed software for sequencing text and photos.¹² The text was suggested by the DJs based on the music they would play, while the photos were selected by André Carrilho in order to mirror the eclectic style of the DJ duo. As in other Video Jack projects, I developed the programming.

1.5.3 Other Video Jack work following *Heat Seeker*

After the release of the *Heat Seeker* CD/DVD, in 2006, I moved to Helsinki to pursue a doctoral degree, and started promoting the project internationally, under the artistic alias Video Jack (which we would use from then onwards on our

¹¹ <http://www.videojackstudios.com/idiotprince/>

¹² <http://www.videojackstudios.com/vj-work/a-to-z/>

audiovisual performances, instead of Coden). The residency at Lux ended shortly after. A few months after the release of *Heat Seeker*, Carrilho and me participated in a tribute to Portuguese musician José Mário Branco, and his politically motivated song *FMI* (Portuguese for IMF, or International Monetary Fund), on the occasion of the 25th anniversary of the piece. Due to the short development time, it would be impossible to create custom animation material for the performance. Since the 20 minute song had very rich lyrics, we decided to develop our work around its words, and developed two separate applications – one to sequence keywords that we selected from the lyrics, and another to sequence photos. These applications further developed the ones we had created for *A to Z*. For the photographic content we asked a collaborator, photographer Marzia Braggion, to take short sequences of pictures based on the keywords. Special animation transitions were created to mix different photos. Live, Carrilho and me manipulated, respectively, the photo and the text software, and mixed the two video signals together using an external hardware video mixer. A video was made of the performance, which would ironically regain popularity in 2011 due to the latest IMF intervention in Portugal.¹³



Figure 17. VJ performance at N.A.M.E. festival with DJ Ellen Alien, September 2007

¹³ <http://www.videojackstudios.com/vj-work/fmi/>

Since the release of the *Heat Seeker* CD/DVD, Video Jack have given preference to integrated audiovisual performances, with their own music and visuals, and have been performing less as VJs. Still, we have been performing as VJs in several international festivals, such as Electro-Mechanica (Russia), Lunchmeat (Czech Republic), N.A.M.E. (France, in four editions; Figure 17), Next (Lithuania), PixelAche (Finland, in two editions), and Videofestival Bochum (Germany). We have also been performing in clubs, such as Kuudes Linja (Finland), Nolla (Finland), Von Krahl (Estonia) and Woo (Lithuania).¹⁴ The present study analyzes the work that follows from the release of the *Heat Seeker* CD/DVD, with the exception of *FMI* and other VJ work (interactive visuals with music composed or performed by others).

1.5.4 Other relevant work

An additional line of work that relates to Video Jack consists of projects I developed between 2004 and 2007 with Portuguese artist Patrícia Gouveia, particularly *Role Playing Egas* (2005). The project has also been released online.¹⁵ The theme of *Role Playing Egas* is the work of Egas Moniz, who introduced the controversial psychosurgical procedure leucotomy (also known as lobotomy), for which he received a Nobel Prize in 1949. The project approaches the life of Egas Moniz and the topic of leucotomy in a multilayered approach, using images from movies on the subject of lobotomy; a video interview to a specialist on Egas Moniz; a comic book; graphically processed technical illustrations; and interactive music (Figure 18).



Figure 18. Screenshot from *Role Playing Egas*

¹⁴ Documentation of VJ performances: <http://www.videojackstudios.com/vj-work/vjing-clubs-festivals/>

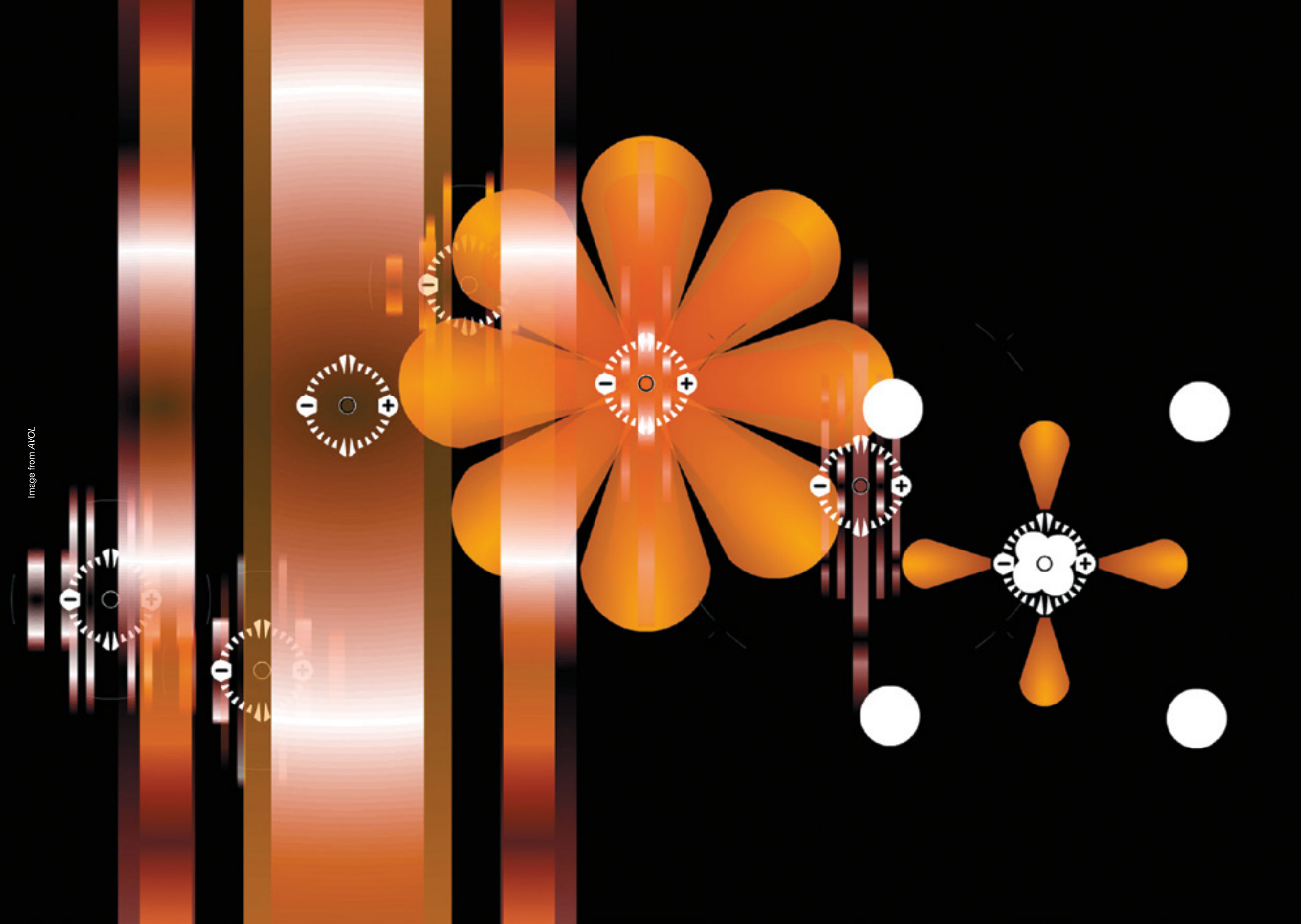
¹⁵ <http://www.nunocorreia.com/projects/2004-2007-work-with-patricia-gouveia>

The interactive music aspect was particularly relevant for my future work, as it was my first experience building a loop player with synchronized music modules. This approach would be further developed in *AVOL. Role Playing Egas* was presented in different festivals in Portugal and also in the USA (at Upgrade! Festival, 2006).

One final thread of work that has influenced Video Jack projects is my teaching. Between 2000 and 2006, I taught different multimedia design courses (mainly about interaction design, project management and Flash development) in different universities in Portugal, as a full time lecturer. From 2007, I have been teaching an average of three courses per year, mostly at Media Lab Helsinki, but also at Tallinn University and at Estonian Academy of Arts. The courses have mainly focused on using object-oriented programming for media manipulation, using Adobe Flash (in an initial stage), HTML5/JavaScript and openFrameworks/C++.¹⁶

These courses have allowed me to explore and test solutions that I would later incorporate in Video Jack projects, while lessons learnt from the projects have also assisted me in my teaching.

¹⁶ My teaching blog at Media Lab Helsinki: <http://mlab.taik.fi/mediacode/>



2 Contextualization: Sound, Image And Interaction

In this chapter, I will present the main research context for the thesis: the relations between audio, visuals and interaction. I will begin with a historical contextualization with projects and artists that are, in my view, key references for Video Jack projects. Then, I will present some concepts associated with audiovisual art: visual music, VJing and synesthesia, exploring the similarities and distinctions between these notions. Next, I will make a short detour, into audio and visuals in more traditional media – cinema, music video and music performances – followed by an incursion to the more recent field of audiovisual mobile apps. The subsequent section will attempt to draw common elements between all these fields, analyzing the deep connection between audio and vision, and relating it to my own work. Finally, I will explore concepts related to interaction in audiovisual systems, again connecting them to my work.

2.1 Historical context and main influences in audiovisual art

The pursuit of visual music has a long history, but it reached an important turning point with animated abstract films in early to mid twentieth century, by pioneers such as Oskar Fischinger, Len Lye and Norman McLaren (Moritz 1997). Oskar Fischinger (1900-1967) was dedicated to a purely abstract approach of visual representation of music. Fischinger was inspired by Bernhard Diebold, who called for “a new blend of the fine arts, music, dance and cinema - or better, new artists, ‘Bildmusikers’ [visual musicians]” to achieve Wagner’s ideal of *gesamtkunstwerk*, “preferably abstract in nature” (Moritz 2004, p.4). Fischinger moved to the USA in 1936, where he would work at Disney, in such projects as the *Toccata and Fugue* segment of *Fantasia*. His particular style, with bold use of color, subjective but harmonious matching of sounds with specific shapes, and strong synchronization between music and sound, has heavily influenced Video Jack projects (Figure 19). His crisp geometric visuals almost seem to have been executed by computer, although they were entirely hand made.

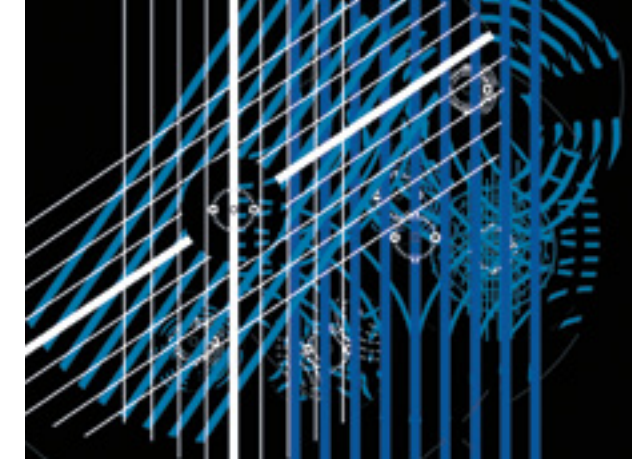


Figure 19. Oskar Fischinger's *Allegretto*, from 1936 (left) and *AVOL* (right)

Fischinger, who preferred an abstract approach to visual music, would leave Disney after his designs were simplified “to resemble some natural form, from a violin to a tin roof to a cloudy sky” (Moritz 2004, p.84). Bernhard Diebold would arrive to a different conclusion: that “Disney figures, with their elastic and rhythmic universe, had just as much pointed the way as had the ‘absolute films’ of Fischinger, Hans Richter, Walter Ruttmann, Lotte Reiniger and others” (Leslie 2006). John Whitney objected to the use of the word “abstract” related to visual music work, since he considered the idea of motion more important than the object that moves. He uses the metaphor of dance to illustrate this: “dancers also perform ‘musical’ patterns of motion, and of course the human body is hardly an abstraction” (Whitney 1980, p.43). Video Jack explore both abstract and non-abstract visuals. In narrative projects *Heat Seeker* and *Master and Margarita* a non-abstract form of visual music was pursued, which has more in common with the lineage of Disney’s *Silly Symphonies* (Figure 20 and Figure 21) than the abstract work of Fischinger or Ruttmann. Additionally, the playful music and sound effects by Carl Stalling in the *Silly Symphonies* was also an influence for the soundtracks of Video Jack projects.

Figure 20. Disney's *Silly Symphonies* – *Hell's Bells* from 1929 (left) and *Master and Margarita* – chapter *The Great Ball at Satan's* (right)





Heat Seeker and *Master and Margarita* in particular reflect André Carrilho's visual style and technique, rooted in traditional hand-drawn animation and illustration. The animation in Video Jack projects attributes importance to "handcrafted" visuals – the basic animation loops are drawn in a timeline, with a Wacom tablet or a mouse, using animation software – combined with programming elements, instead of a purely computer-generated approach. Regarding abstract projects such as *AVOL* and *AV Clash*, the use of "handcrafted" animation elements allows for a distinctive visual character, sometimes reminiscent of the pre-digital visual music.

When Oskar Fischinger moved to the USA, he became an inspiration to a younger generation of visual music artists, such as brothers John and James Whitney, who "decided to take up abstract animation after seeing a screening of Oskar's film at the Stendhal art gallery in 1939" (Moritz 1995). John Whitney was a pioneer in the use of computer graphics for animation (Goodman 1987, pp.157–158). The animations in *AVOL* and *AV Clash* resemble John Whitney's floral compositions. Quoting Gene Youngblood's description of one of his animations (which could also be applied to *AVOL* or *AV Clash*): "all colors move into the ring simultaneously from all sides, forming circles within circles all scintillating smoothly

Figure 21. Disney's *Silly Symphonies - Skeleton Dance* from 1929 (left) and *Master and Margarita - chapter It's Time, It's Time* (right)

Figure 22. John Whitney's *Catalog*, from 1961 (left) and *AVOL* (right)



in a floral configuration" (Youngblood 1970, p.220). Figure 22 compares a still from *Catalog*, a "sample reel" of his designs released in 1961, with *AVOL*. Many of John Whitney's animations are concentric, mirroring natural entities of different scales: from microscopic to astronomical (such as atoms, bacteria, flora, stars and planets). The abstract IAVO animations are also concentric, and share the same inspiration from nature.

From the more recent generation of digital audiovisual artists, I will highlight the influence in my work of Golan Levin (with his *Audiovisual Environment Suite - AVES*, from 1998-2000), Toshio Iwai (particularly *Electroplankton*, from 2006) and Sergi Jordà (*FMOL*, from 1998, and *Reactable*, from 2005). The influence of *AVES* relates to its pursuit of an integrated audiovisual expression, giving equal importance to audio and visuals. The influence of Levin is both practical and theoretical. The serial nature of his audiovisual "suite" has been influential for developing my iterative path. Although he is not the first to use the term "audiovisual" in this context, his use of this term (and acronym "AV") instead of other terminology such as "visual music" has also influenced both the naming of my projects and the terminology used in this dissertation, which gives prevalence to the term "audiovisual" over related terminology.

Toshio Iwai's *Electroplankton* was released by Nintendo in 2006. It is an interesting case of a collaboration between a media artist and a video game company. It consists of ten "musical toys", where playful visuals are used to give the impression of an aquarium "filled with different species of plankton that can produce sound and light when you interact with them" (Davis 2006). The "plankton" entities have a simulated biological behavior, "serving as a visual and functional metaphor enabling the simultaneous generation of visuals and music" (Stockburger 2009, p.122). *Electroplankton* can also be seen as a summary of Iwai's previous work, such as *Composition on the Table*. There is some resemblance between the abstract IAVOs in *AVOL* or *AV Clash* and the aquatic entities in *Electroplankton*, even more apparent when collisions occur. The collisions are one of the more "game-like" aspects of *AVOL* and *AV Clash*, and have been more fully explored in the latter (as evidenced by the project's name). Figure 23 compares *Electroplankton* and a still from *AV Clash*, with a clash between two IAVOs taking place.

The influence of Jordà's work has been important regarding the issue of sound visualization and visual feedback, Internet-based music composition (via *FMOL*, which also influenced the naming of *AVOL*), and the idea of interactive audiovisual modular entities (via *Reactable*). The objects in *AVOL* and *AV Clash*, due to their "draggable" nature and fluid movement in space, in addition to their audio-reactivity, bear resemblance to the animated modules in *Reactable*. The more complex nature of the UI in *AV Clash* IAVOs, with additional faders,

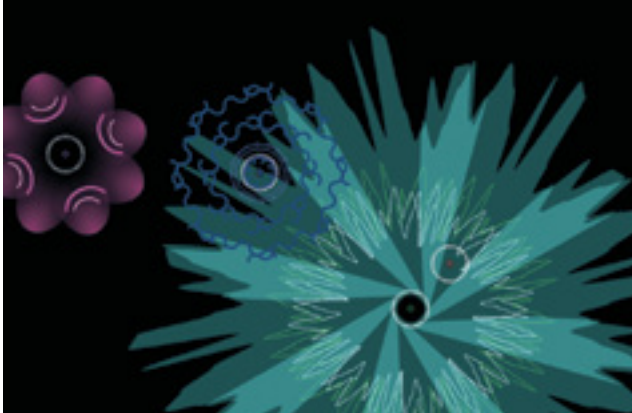


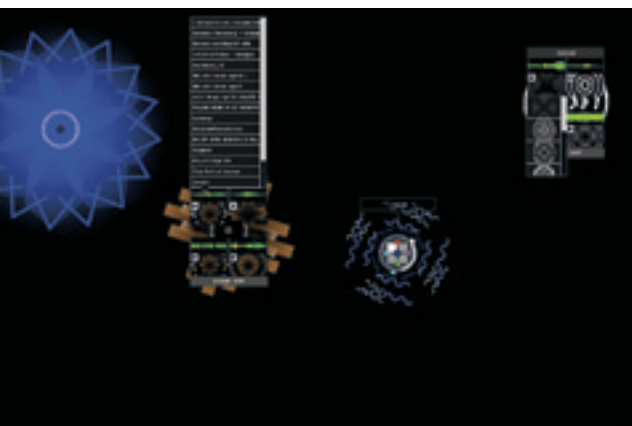
Figure 23. Toshio Iwai's *Electroplankton*, from 2006 (left) and *AV Clash* (right)

menus and options, comparing to *AVOL*, further resemble the richness of the interface within the modules in *Reactable* (Figure 24). Both *Electroplankton* and *Reactable* develop the notion of interactive audiovisual modules, which can be combined to create an audiovisual whole – influential for my concept of IAVO. Like *Electroplankton* and *Reactable*, Video Jack projects fuse performer and audience into one entity (the user).

The *Soundtoys.net* website¹⁷ and the numerous online audiovisual works it showcases are also important references for my work. *Soundtoys.net* “is the internet's leading space for the exhibition of exciting new works by of audio visual artists”, according to its curator, the artist Stanza (Stanza 1998a). *Soundtoys.net* is open to “artists, designers, musicians, writers and programmers who make (or who are interested in the aesthetics of); interactive web soundtoys, artworks and related texts” (Stanza 1998a), and showcases a large number of projects. Despite the apparent emphasis on sound, Stanza defines soundtoys as “new audio visual experiences” or “the fusion of audio and visual output through new technologies made available for the Internet” (Stanza 1998b). The curator and artist considers that “the synthesis of the visual to the audio is increasingly becoming a central

¹⁷ <http://www.soundtoys.net/>

Figure 24. *Reactable*, from 2005 (left) and *AV Clash* (right)



issue in the development of interactive media on the web” (Stanza 1998b), and this manifesto has been influential for my work. The website does not seem to be very active at the moment, with most works dating from a few years ago. Still, it remains an important repository of works in the field of online audiovisual expression.

In the recent years, several exhibitions, books and conferences have focused on the theme of visual music and audiovisual art. From the exhibitions, I would highlight: the *Sons et Lumières* exhibition at Centre Pompidou in Paris, in 2004–2005;¹⁸ the *Visual Music* exhibition at the Museum of Contemporary Art in Los Angeles, in 2005;¹⁹ and the more recent *See this Sound* at Lentos Art Museum, Linz, in 2009.²⁰ All three originated very detailed catalogs (in the case of the third, later expanded into a series of publications and a web archive)²¹, which serve as valuable references into the history of visual music (respectively: (Lista & Duplaix 2004); (Brougher et al. 2005); (Rainer et al. 2010)). I consider that Golan Levin's Master thesis also provides a very complete introduction to the history of visual music and audiovisual art (Levin 2000, pp.21–58). The recent book *Audio.Visual* also constitutes an in-depth look into the history and state of the art of the field (C. Lund & H. Lund 2009). The conferences *Audio-visibility*²² (Aarhus, 2011) and *Seeing Sound*²³ (Bath, 2009 and 2011) demonstrate the current interest in this area. There are several organizations active in promoting the field of audiovisual art, notably the Center for Visual Music²⁴ and the *iotaCenter*²⁵. A number of websites are dedicated to this topic, notably Maura McDonnell's *Visual Music* blog²⁶ and Heike Sperling's archive on *Visual Music*.²⁷ There are several festivals specialized in (or with a strong emphasis in) audiovisual art, such as *Mapping*²⁸ (Geneva), *Mutek*²⁹ (in Montreal and other cities), *Laboratório de Electronica Visual*³⁰ (Gijón) and *Live Performers Meeting*³¹ (Rome).

¹⁸ <http://www.centrepompidou.fr/Pompidou/Manifs.nsf/0/E4B6AD56B6DA4B2FC1256DD600561C77?OpenDocument&sessionM=&L=2&form=>

¹⁹ <http://www.moca.org/museum/exhibitiondetail.php?id=350>

²⁰ http://www.lentos.at/en/747_1769.asp

²¹ <http://see-this-sound.at/>

²² <http://audiovisuality.au.dk/>

²³ <http://www.seeingsound.co.uk/>

²⁴ <http://www.centerforvisualmusic.org/>

²⁵ <http://www.iotacenter.org/>

²⁶ <http://visualmusic.blogspot.com/>

²⁷ <http://www.heikesperling.de/visualmusic.0.html>

²⁸ <http://mappingfestival.ch/>

²⁹ <http://www.mutek.org/>

³⁰ <http://levfestival.com/>

³¹ <http://www.liveperformersmeeting.net/>

2.2 Related concepts

2.2.1 Visual music and audiovisual

When defining visual music, Ox and Keefer (2008) distinguish between four “differently formed visual structures”:

- A visualization of music, which translates sound into visuals, “with the original syntax being emulated in the new visual rendition”. According to Ox and Keefer, this can also be defined as intermedia.
- A time-based visual composition, which is similar to the structure of a kind or style of music – “as if it were an aural piece”. It can have sound, or exist silent.
- A direct translation of image to sound – “literally, what you see is also what you hear”. Some of Norman McLaren’s works (where scratchings on film produce simultaneously image and sound) fit in this category.
- A static visual composition, “as in Klee”.

According to William Moritz, visual music aims “to create with moving lights a music for the eye comparable to the effects of sound for the ear” (Moritz 1986). This fits into the second of Ox and Keefer’s definitions of visual music presented above. The first definition is the most adequate to describe the projects developed in the scope of this study. However, I prefer the use of the related term “audiovisual” instead of “visual music”, for three main reasons. Firstly, the latter term has become somehow associated mostly with works from early to mid twentieth century: “the presentation of visual music at exhibitions and in academic and theoretical discussions has mainly emphasized historical issues, such as the development of color instruments or experimental film before the 1960s” (C. Lund & H. Lund 2009, p.11). Secondly, contemporary artists who have influenced my work, such as Golan Levin, have adopted the term “audiovisual” to describe their own work. Thirdly, the term establishes a connection to Michel Chion’s book *Audio-Vision* (1994), which is a major reference for this dissertation.

2.2.2 VJing

Although the origins of VJing (or VJ culture) can be traced earlier (notably to the light shows of the 1960s, but also to earlier experiments in visual music), VJing developed with the rise of electronic music at the end of the 1970s and 1980s, and gained popularity in the 1990s with the ascendance of electronic dance music and club culture. According to Bram Crevits, the term VJ (Video Jockey) was first used at the end of the 1970s in the New York Club “Peppermint Lounge” (Crevits 2006, p.14). Föllmer and Gerlach place the emergence of VJing in the clubbing scene of the 1990s (Föllmer &

Gerlach 2005). Bram Crevits states that the VJ appeared due to the nature of house parties: “because of the absence of a stage act there was a demand for a new visual experience” (Crevits 2006, p.14). Musician Robin Rimbaud (also known as Scanner) describes that the development of VJing mirrors “the role of the DJ in their use of digital tools as musical instruments, with the turntable replacing the more traditional functions of a keyboard or guitar” (Rimbaud 2006, p.49).

Clubbing culture and technological developments seem, therefore, the main vectors behind the development of VJing. Chris Salter explains the emergence of “screen-based performance” in the 1990s, adopting “a long litany of names such as audiovisual performance, real-time video, live cinema, performance cinema, and VJ culture” (Salter 2010, p.172) as the result of these two branches of techno-cultural development: on the one hand, “breakthroughs in digital computation, particularly the development of hardware and software components for the capture, processing, and manipulation of image and sound” and on the other hand, “the international rise of the techno/club scene, which rapidly exploited such technologies” (Salter 2010, p.172).

Culturally, VJing emerges as an answer to the need for a visual component in clubs, complementing the limited visual impact of the DJ. Technically, the development of VJing mirrors the evolution of the DJ, but with a delay – digital audio technology, which is less processor and storage intensive, evolved earlier than digital video technology. Thus, as the musician literally exited the stage of clubs, to be replaced musically by the DJ, a new visual player took the stage – the VJ, whose visual approach shared sensibilities, methodologies and technology with the DJ. In the 1990s, VJing became part of a postmodern culture that embraced sampling, quoting and remixing. It also established a parallel between audio and visual media, with VJing appropriating concepts such as “scratching”, “jamming”, and “jockey” from the music and DJing areas. As music technology and culture evolved in the 1980s, with samplers and turntables allowing for the sonic reconstruction of audio materials, so did video technology and visual culture follow the same path in the 1990s regarding visual materials.

VJ culture, according to Salter, aimed to bring “weight to sound and image as central elements in the overall spatio-physical ambience of clubs” and set the ground for “the aesthetic of performance-based audiovisual work” (Salter 2010, p.173). VJing in clubs added to a “strange multi-sensorial” experience, according to Crevits, composed of separate, but “inextricable” elements: “the DJ spins records, the VJ triggers loops and someone else manipulates the strobe light, mostly without any form of pre-arrangement” (Crevits 2006, p.15). In most cases, the contact between the musician or DJ and the VJ is loose, and not based on prior discussion or a technical connection. As Föllmer and Gerlach observe,

“it is primarily based on rough outlines or on improvisation” (Föllmer & Gerlach 2005). In most occasions, the VJ follows the DJ, attempting to connect the visuals to the DJ’s music. The connections between music and image are “primarily atmospheric” and they relate to reality on distinct levels: “while real images are frequently used in the visuals (...), the music is hardly concrete or narrative throughout” (Föllmer & Gerlach 2005). Rhythm is also an important element integrating image and sound. Audio and visual synchronicity is a starting point for DJ/VJ works, according to Föllmer and Gerlach (2005). The degree of this synchronization is based on an individual artistic choice: “image and sound can be brought together at junctions, or they can also be synchronized or counterpointed throughout” (Föllmer & Gerlach 2005).

VJ performances do not happen exclusively in clubs, or with DJs. VJs also perform with bands, similarly to the light show acts of the 1960s and 1970s. Adrian Shaughnessy lists some of these types of venues: “VJs now perform in theatres and art galleries, and at the big summer music festivals; they perform in the open air and at the many film and new media festivals” (Shaughnessy 2006, p.10). The space and technical characteristics of the venue are important elements to convey an appropriate visual experience to the audience. Shaughnessy quotes VJ Torsten Oetken: “we experience the most creative freedom with projects where the design of the actual space is part of the process” (Shaughnessy 2006, p.11). Salter attributes this cross over of VJ culture from the club and into other contexts to a shift towards commercialization in the club scene in the early 1990s. This cross over was accomplished, according to Slater, either by “do-it-yourself” VJs or by “those working with computers in areas outside of dance culture, such as graphic and multimedia design, digital filmmaking, and architecture, whose leisure time was spent in the alternative, technologically constructed ambiance of club experience” (Salter 2010, p.173).

2.2.3 Synesthesia

Synesthesia means, literally, to perceive (“esthesia”) together (“syn”) (van Campen 2007, p.1). It is a phenomenon with a biological basis that is found in a minority of people (Ward 2008, p.2). People with synesthesia (synesthetes) feel a different sensation added to the one that would be normally expected – for example “the sound of a flute may be a pastel lemon color” (Ward 2008, p.3). Many artists aim to recreate this (Ward 2008, p.2). Van Campen compares an experience of a synesthete that “sees images as soon as he hears images and sounds” to a “music video clip without TV” (van Campen 2007, p.11). As a result of his interviews with synesthetes, van Campen concluded: “music-induced images are never the same for two people” (2007, p.14). Some synesthetes perceive a “one way traffic” relation between sound and colors (colors suggesting sounds or vice versa), others perceive a “two way traffic” relation (van Campen 2007, p.15).

Associations between colors and sound notes are frequent even among non-synesthetes. In a study comparing a group of synesthetes and a control group of non-synesthetes, Jamie Ward asked participants to choose the most adequate color for a given sound, and concluded that “whereas synesthetes tended to choose very similar colors if given the same sound twice, the controls were more variable” (Ward 2008, p.75). However, in this study both the control group and synesthetes “showed a relationship between ascending pitch and the increasing lightness of the color”. Even the “high” and “low” special metaphors for describing sound frequency suggest the multisensory association. Ward also found evidence of a systematic relationship between pitch and size – high-pitched sounds are smaller in size (Ward 2008, p.77). A newborn child perceives all the sensory input as a whole. They presumably sense their environment as “a blend of light, sound, smell, and other impressions” (van Campen 2007, p.29). This natural synesthesia of babies fades away slowly as the senses start to develop and specialize (van Campen 2007, p.30). Thus, concludes van Campen, everyone is probably born with synesthesia, and then loses these perceptual capabilities throughout their lives – except for synesthetes, who maintain them, although in a limited and altered way (van Campen 2007, p.32). When Western children enter adolescence, they look for new sensorial stimulation, in order to explore their environments. Experimental art forms, such as audiovisual art, challenge the traditional forms of perception, and open the way to multisensory perceptions (van Campen 2007, p.163).

Several painters, such as Whistler, Kandinsky, Klee, Mondrian and Hockney were interested in creating paintings that captured aspects of music (Ward 2008, pp.127–128) (van Campen 2007, pp.43–44). In the beginning of the 20th century, the German artistic group Der Blaue Reiter (“The Blue Rider”) executed creative experiments combining different disciplines, such as dance, painting, music and theatre. Kandinsky, who collaborated with Der Blaue Reiter, established a correspondence between colors and sounds in his book “Concerning the Spiritual in Art” (Kandinsky 1977, pp.38–41). This correspondence has been influential to artists creating digital audiovisual compositions, such as Adriano Abbado (Abbado 1988, pp.5, 11). Kandinsky advocates a “dance-art of the future”, composed of three elements: musical, pictorial and physical movements (1977, p.51). According to van Campen, the book marks a turning point in the history of art towards abstraction (van Campen 2007, p.56). While Kandinsky was inspired by erudite music, Mondrian sought inspiration in popular music, namely jazz (van Campen 2007, p.58). Mondrian’s exploration of rhythm and movement culminated in his *Boogie-Woogie* series from the 1940s (van Campen 2007, p.59).

Musicians also used colors and graphics for inspiration. In the 19th century, Liszt gave directions to his orchestra musicians based on colors (van Campen 2007, p.19). Messiaen has described how his choice of chords is affected by their color (Ward 2008, p.128). His color-sound associations are highly consistent (Cook 2000, p.30). In Schoenberg's work *Die Glückliche Hand*, completed in 1913 but not performed until 1924, the costumes, stage set and lighting involve coordinated use of color, in relation to music (Cook 2000, pp.41–42). Ligeti used pictures in order to compose music (van Campen 2007, pp.21–23). When researching if synesthesia could be fruitfully used in art, Ward found that artistic and musical inclination was influenced by one type of synesthesia – “visualized music” – either for playing and composing music or for drawing and painting. A likely scenario, in his view, is that “experiences associated with visualized music are sufficiently rich and beautiful in themselves” to provide inspiration for making music and art (Ward 2008, p.129).

Some authors have used the term synesthesia to encompass visual music and audiovisual art: “synesthesia has also been a major theme of artistic research since the 1950s, when technological innovations in electronic and digital images and sound offered new possibilities for the performance of synesthetic experiments” (Popper 2007, p.161). Many of the early visual music works were in fact concerned with direct sound and color correspondences (van Campen 2007, pp.45–48). However, I prefer not to use the term synesthesia in this context. According to Van Campen, the visuals of the light show artists of the 1960s up to today's VJs have little in common to “true synesthetic experiences”, besides the presence of abstract graphics (van Campen 2007, p.18). Perceptions of colored music by synesthetes are “permanent and consistent”. For synesthetes, “sound and images are immediately and inextricably perceived as a whole” – not some visual element that is “added” to the music, as in most VJ performances and music videos (van Campen 2007, p.18). Eisenstein did not consider synesthetic correspondences as a “viable basis for the relationship between music and moving pictures”, focusing instead on the associations of the different media within a film – he describes what he calls an “identical motion” linking pictures and music (Cook 2000, p.57). Lipscomb also argues that synesthesia is not a solid foundation upon which to build an appropriate theory of multimedia perception, since the number of synesthetes is small, and because its effect upon those synesthetes varies (Lipscomb 2002, pp.230–231).

2.3 Image and sound in cinema, music video and performances

2.3.1 Cinema and “music film”

When Eisenstein and his music collaborator, Prokofiev, put music and pictures together, it often had effects that would surprise them. This resonates with Eisenstein's notion of montage – that two films, of any kind, placed together, combine into something different, of a new quality, resulting from that juxtaposition (Cook 2000, p.84). Eisenstein extended his concept of film montage to encompass the montage of film and sound – what he called “vertical montage” – arguing that there is no major difference between the approach to purely visual montage and to sound and image montage (Cook 2000, pp.84–85). In a chapter of his book *The Film Sense* suggestively titled “Synchronization of the Senses”, Eisenstein presents his concept of “vertical montage”. His basis for this concept is the “orchestral score”, where each part is developed horizontally. However, he notes that “the vertical structure plays no less important a role, interrelating as it does all the elements of the orchestra within each given unit of time” (Eisenstein 1986, p.64). Moving to an “audio-visual score”, Eisenstein proposes the addition of a new part: “this new part is a ‘staff’ of visuals, succeeding each other and corresponding, according to their own laws, with the movement of the music – and vice-versa” (1986, p.64).

Walt Disney's *Fantasia* was first released in 1940s, and at that time it was commercially unsuccessful, failing to appeal either to the intellectual audience or the general public. It was re-released in 1970's, targeted to a new audience in the aftermath of the Beatle's *Yellow Submarine* (Cook 2000, p.175). The various scenes in *Fantasia* are either semi-abstract or representational, without much unity between the different segments. Different teams worked on those segments, with little overlap in the personnel (Cook 2000, p.179). Regarding the parts with semi-abstract imagery in *Fantasia*, Cook argues that images and sounds have similar importance: “if the images take on the rhythmical properties of the sounds, then equally the sounds take on the connotations of the images (...) there is a reciprocal transfer of attributes between them” (2000, p.210). He argues that this transfer is less successful in more figurative sections.

Fantasia is sometimes criticized for imposing an identification of the images with the music, therefore “closing the borders to fantasy”. Cook dismisses these criticisms. In his opinion, *Fantasia* belongs to a genre that he entitles “music film” by analogy with music video, “which begins with music, but in which the relationship between sound and image are not fixed and immutable but variable and contextual, and in which dominance is only one of a range of possibilities” (Cook 2000, pp.213–214). Therefore, it would not be a “projection through means of ancillary media” of one original

meaning, but a construction of a new experience, whose limits are not set by its authors, but by anyone who watches and listens to the work (Cook 2000, p.214). Having this issue of “closing the borders to fantasy” in mind, I have asked in the questionnaire if respondents feel that Video Jack audiovisual projects limit their imagination, compared to a purely sonic or visual experience. I believe that Video Jack projects fit in this genre of “music films” identified by Cook, particularly the linear video versions of *Heat Seeker* and *Master and Margarita* – their narrative approach and chapter structure resembles that of *Fantasia*.

2.3.2 Music video

In music videos, the song comes first, and then the director normally creates the images taking the song into account. Music videos have a wide range of styles, from abstract to narrative. However, most videos “do not embody complete narratives or convey finely wrought stories”, otherwise “the song would recede into the background, like film music” (Vernallis 2004, pp.3–4). Music videos benefit from withholding information, “confronting the viewer with ambiguous or unclear depictions” (Vernallis 2004, p.4). The viewer becomes a participant in the music videos, as it is up to her/him to determine the ultimate meaning (Vernallis 2004, p.10). The meaning of a music video is a “puzzle” for the viewer to solve – “stories are suggested but not given in full” (Vernallis 2004, p.37). Video Jack narrative projects, *Heat Seeker* and particularly *Master and Margarita*, follow this logic.

Carol Vernallis states that “most of the particularity of music video editing lies in its responsiveness to the music” (2004, p.27). The editing underlines certain aspects of the song, such as rhythm, phrases or structure, preserving the momentum. An arresting edit can allow the viewer to “move past a number of strange or disturbing images while neither worrying about them nor forgetting them completely” (Vernallis 2004, p.27). Video interlaces different structures in an unpredictable way – “the sheer density of this interlace provides one of music video’s greatest pleasures” (Vernallis 2004, p.53). Quoting Scott McCloud’s studies on comics, Carol Vernallis establishes a parallel between the edits in music videos and the language of comic books. McCloud states that the reader, when facing gaps between panels of a comic, calculates the amount of time elapsed, the distance traversed, and any change in the figures (McCloud 1993). Vernallis argues that the edits in music videos work in the same way (Vernallis 2004, p.38).

As Will Straw observes, two claims were common among the first wave of treatments on music video in the context of cultural theory, following the emergence of MTV in 1981: firstly, that music video had made image more important than music itself, with negative connotations; secondly, that music video limited the imagination of the viewer, by imposing one unique visual interpretation (Straw 1993, p.3). However, by

the early 1980s, the music video was not the only contributor to the “image” of a musician – “it was simply part of the overall semiotic richness and high level of contextualization with which popular music in this period became endowed” (Straw 1993, p.10).

2.3.3 Music performances

According to Austerlitz, the enjoyment of music has always been linked with the experience of “watching a performer physically produce musical sound” (Austerlitz 2008, p.11). The performer’s body language has been a fundamental aspect of the music experience. Grossberg notes the importance of the visual element in rock performances, where the audience can testify “the concrete production of the music as sound, and the emotional work carried in the voice” (Grossberg 1993, p.204). He adds that “the demand for live performance has always expressed the desire for the visual mark (and proof) of authenticity” (Grossberg 1993, p.204). The physical gestures of the musician can have more or less significance. Cook compares a classical guitarist with Jimi Hendrix, and concludes that, since the latter’s physical motion was a counterpoint to the music, it incorporates additional meaning (Cook 2000, p.263).

The rise of radio and mechanical reproduction of media in the twentieth century changed this scenario (Benjamin 2008). Music became a “commodity”, possible to be “disembodied” from the performers (Austerlitz 2008, p.11). Parallel with these technological advancements, efforts were made to “reunite the separated segments of the musical experience”, merging sound and image, and creating a new art form, to realize “Wagner’s dream of *gesamtkunstwerk*” (Austerlitz 2008, pp.11–12). As Robin Rimbaud states, with “the decline of record sales and the rise in file-sharing” – and I would add, with the lack of visuality in electronic music performances – “an artist today needs to offer a show: a bold, theatrical exploration of their sound and aesthetic” (Rimbaud 2006, p.49).

In their music/visual/audiovisual performances, laptop musicians and VJs share the same problem: audiences do not understand the performer’s role. As Lew states, in the context of a live visuals performance: “during our shows, most non-specialist audience members assumed video was pre-recorded and did not understand the performer’s role on stage” (Lew 2004, p.146). The same logic could apply to audio. Lew concluded that, to solve this problem, the interface has to be both transparent: “the audience wants (...) to see the performer’s actions and understand what is happening behind the scene” and performative: “so that the audience can be engaged in the performer’s effort and perceive how it is related to the images and sounds produced” (Lew 2004, p.146). Video Jack attempt to reach this transparency by showcasing the GUI in performances – the same screen that is seen by us in performances is projected to the audience.

2.4 Audiovisual mobile apps

While *Soundtoys.net*, a site that started in 1998 (Stanza 1998a), may represent an audiovisual “scene” of the first decade of the twenty-first century, focused on the web as a platform, a new area for audiovisual exploration is emerging, using multi-touch mobile devices (with an emphasis on Apple’s iOS and Google’s Android) as its main platform. The launch of the iOS App Store, in July 2008, opened the door to numerous interactive music applications (“apps”). Among these, a particular kind of app has appeared – a “music box” type of artistic app, a playful alternative to the linear, passive music listening experience. These apps usually contain interactive and/or automatically generated music, and a visual counterpoint. I will mention some examples of these audiovisual apps that are particularly relevant for the present study: *Bloom*, *Biophilia* and *Reactable*.

Bloom, a music app developed by ambient pioneer Brian Eno and musician / software designer Peter Chilvers,³² is an important reference in this field, since it was released less than three months after Apple launched its App Store. It allows the creation of elaborate patterns and melodies by simply tapping the screen, accompanied by matching visuals. The experience resembles touching a liquid surface, resulting in stylized ripples. The immediacy of touching is therefore an important element for the app. When *Bloom* is idle, a generative music player takes over, “creating an infinite selection of compositions and their accompanying visualizations” (Opal Limited 2008). *Bloom* fulfills Brian Eno’s ideal of making music with materials and processes he had specified, but using combinations and interactions that he had not (Eno 1996, p.330). Brian Eno is also a visual artist, having pursued the same concept of multiple variations of the same basic modules in his visual work (often with a sonic counterpoint). This visual exploration is also present in *Bloom*, although not with the same level of complexity as the audio side.

In 2011 Björk released her *Biophilia* album together with a series of iOS apps, one per track on the album.³³ The apps combine music with art, science and gaming (Empire 2011). For example, in one of the songs the user is challenged to stop cells being attacked by a virus. Björk wants the audience to recreate her work: “what you see live is only us playing our version (...) you can play totally different versions at home” (Needham 2011). Björk aims to create added value with the interactivity and multimodality of her apps, in the same way that she aimed at adding value by juxtaposing image and sound in her music videos: “I would like to feel the apps are equal to the song in the same way I have always aimed for the music video to be equal to the song: the 1+1 is 3 thing” (Pareles 2011a). Scott Snibbe, the media artist who managed the *Biophilia* app project, shares these views.

32 <http://itunes.apple.com/app/bloom/id292792586>
33 <http://itunes.apple.com/app/bjork-biophilia/id434122935>

He believes that media will be dominantly interactive: “we’re entering the age of interactivity (...) the passive, one-way media will become a blip in human history” and adds that in *Biophilia* music, visuals and interactivity are seamlessly integrated: “The music wasn’t dominant, the image wasn’t dominant, the interactivity wasn’t dominant (...) everything worked together the way a movie or an opera does” (Pareles 2011b). This description echoes Richard Wagner’s ideal of the total artwork, or *gesamtkunstwerk*, an operatic performance that encompasses music, theatre, and the visual arts (Wagner 2001).

The *Biophilia* project has unusual scope and ambition – to release one interactive audiovisual application per track of the album, and to create a coherent experience across different platforms: album, performance and mobile app. It resembles the approach by Video Jack with *Heat Seeker*: the project was released as interactive audiovisual web project (one interactive “chapter” per track), as CD/DVD (the DVD containing one music video per track, based on the interactive version), and as live performance (using essentially the same software engine as the web version).

Reactable is a relevant example of a new media art project that has been adapted into a new platform – a mobile app.³⁴ It is one of several examples of well-known new media art projects (and in particular of audiovisual ones), originally released before the iOS app store existed, that have gone through that process, such as *Sonic Wire Sculptor*.³⁵ The example of *Reactable* is also important for the present study, since Video Jack projects (particularly *AVOL* and *AV Clash*) have elements in common with it, as discussed in section 2.1. With the adaptation into this new platform, *Reactable* lost the physicality of the tangible blocks, but gained new reach in terms audience, who otherwise would have not been able to afford one of the larger tables.

As a side note, these three apps have some elements in common. Scott Snibbe, who collaborated with Björk for *Biophilia*, had previously worked with Brian Eno (van Buskirk 2011). And Björk has used the original *Reactable* in her concerts. For the present generation of apps and app creators, the experience gathered in previous exploratory art platforms is still influential.

The app “scene” around music and audiovisual apps is thriving, with new projects emerging at a fast pace. Websites such as Creative Applications Network,³⁶ Create Digital Motion,³⁷ Create Digital Music³⁸ and Evolver.fm³⁹ regularly survey new apps, and there is a community of enthusiasts gathering vir-

34 <http://www.reactable.com/products/mobile/>

35 <http://sws.cc/>

36 <http://www.creativeapplications.net/>

37 <http://createdigitalmotion.com/>

38 <http://createdigitalmusic.com/>

39 <http://evolver.fm/>

tually among the social networking extensions of these websites (and in other venues, including “real life” gatherings). The mobile app stores (mainly iOS and Android so far) have provided developers with a business model missing from the web “sound toys”.

2.5 Further reflections into audio-vision

2.5.1 Inherent multi-sensoriality in music

The alignment of music with other media is very frequent, in different levels of intensity. As Cook states, “the cohabitation and confrontation of different media are inscribed within the practice of Western classical music (...) in the relationship of sound and notation” (Cook 2000, p.270). Besides the visual element of the performer, Cook cites other examples of the importance of image in music, such as the scenic environment of the performance and the record cover (Cook 2000, pp.265–266). Grossberg supports this view, stating that music is more than auditory; it cannot be separated from “its anchor in other media and forms” (Grossberg 1993, p.188). Cook stresses the importance of context, stating that media such as “music, texts, and moving pictures do not just communicate meaning, but participate actively in its construction” (Cook 2000, p.261). Music has not only meaning but also potential for meaning, and that potential is fulfilled in relation with the context in which it is received. Meaning resides “not in musical sound, then, nor in the media with which it is aligned, but in the encounter between them” (Cook 2000, p.270).

According to Föllmer and Gerlach, technology-driven approaches to audiovisual art often overlook that “music actually already possesses intermedia characteristics” due to its “special production and reception conditions” (Föllmer & Gerlach 2005). Throughout the twentieth century, musical practice has reflected this, both in performance: “the concert is being enhanced by a variety of forms of visualization” and also in notation: “customary notation is being replaced by graphic symbols and visually influenced forms of interaction” (Föllmer & Gerlach 2005). Intermediality in music is therefore “a phenomenon which is inherent in music itself” and, with the assistance of visual media, it “can be molded in particularly effective and diverse ways” (Föllmer & Gerlach 2005). Jutz states that there is an additional underlying visual element in electronic music in particular: “synthetic sound has something uncanny about it, because at its origin is neither an instrument nor a voice, but rather, a graphic symbol” (Jutz 2010, p.81). This observation relates to the oscillators used in synthesizers, to produce a repetitive electronic signal such as a sine or square wave.

Chion goes further, and states that there is no “sensory given” that is isolated from the start: “the senses are channels, highways more than territories or domains”. He clarifies this,

stating that “when Kinetic sensations organized into art are transmitted through a single sensory channel”, they can convey all the other senses via that one channel. (Chion 1994, p.137). Chion exemplifies this with the inherent visuality of concrete music, and the implied sound behind silent movies.

2.5.2 Audio-Vision

Michel Chion refutes the idea of a sound corresponding “naturally” to an image, and considers that “added value” is the most important of the relations between sound and image. He defines added value as:

“the expressive and informative value with which a sound enriches a given image so as to create the definitive impression, in the immediate or remembered experience one has of it, that this information or expression ‘naturally’ comes from what is seen, and is already contained in the image itself” (Chion 1994, p.5).

He also states that added value works reciprocally: on the one hand, “sound shows us the image differently than what the image shows alone”; on the other hand, image “makes us hear sound differently than if the sound were ringing out in the dark” (Chion 1994, p.21). In his foreword to Chion’s *Audio-Vision*, Walter Murch expresses the opinion that the combination of sound and image should be done in order to “stretch the relationship of sound to image wherever possible”, that is, “to create a purposeful and fruitful tension between what is on screen and what is kindled in the mind of the audience” (Chion 1994, p.xix). It is this tension, this space “in between” that Chion calls sound “en creux” and Murch translates into “sound in the gap”.

In Video Jack projects, I aim to generate added value by creating sounds and animations that are in harmony, but that do not mimic each other excessively (as do, in my opinion, some generic music visualizers in media players), creating a certain space. It is within this space, between total mimicry (or “naturalism”) and the “limit of the stretching” that Murch refers to, that we aim to operate in Video Jack projects. Using a tactile, non-audiovisual, metaphor for the sake of sensorial neutrality, one could say that IAVOs are attempts to sculpt the “gap”, to shape the gap that Chion and Murch allude to. I believe that Video Jack, as a duo composed of an electronic musician and an animator, are in a good position to sculpt this gap, as we have a high degree of control over digital audio and visual raw materials.

Chion also states that synchronization is an important factor in the relation between visuals and audio: “it manages to glue together entirely unlikely sounds and images” (Chion 1994, p.54). According to Föllmer and Gerlach, synchronicity between music and visuals is “an important means for creat-

ing an integrated experience”, and they exemplify with DJ/VJ works, which according to them “start at precisely this point” (Föllmer & Gerlach 2005). As rhythm is a feature that can be perceived both in music and in visuals, it plays “the most extensive integrative role in the audiovisual reception process” (Föllmer & Gerlach 2005). Rhythm manifests itself “as image allocation, movement of the figures, or as the editing rhythm of the film; as musical pulse or as melodic-rhythmic figure”; these structures can be experienced “physiologically or physically” (Föllmer & Gerlach 2005). In IAVOs, this synchronization is forced upon the visuals by an algorithm that matches sound amplitude and scaling of the animations.

Based on the idea of synchronization (and also synthesis), Chion created the notion of synchresis: “the forging of an immediate and necessary relationship between something one sees and something one hears at the same time” (Chion 1994, p.224). According to Chion, synchresis allows for numerous combinations of possible sounds with possible images: “for a shot of a hammer, any one of a hundred sounds will do” (Chion 1994, p.63). But random associations may not generate synchresis: “play a stream of random audio and visual events, and you will find that certain ones will come together through synchresis and other combinations will not” (Chion 1994, p.63). Using Murch’s terminology, I suggest that those combinations that did not generate synchresis have “stretched the relationship” between sound and image too far. As Salter asserts, although Chion writes about the relation between sound and image in film sound design, “his description could equally be applied to the diverse set of practices from artists and designers” who have been creating “audiovisual performance events” (Salter 2010, pp.165–166).

Going back to the idea that there is no “natural” correspondence between sound and image, Chion proposes the notion of “audiovisual contract” as “a kind of symbolic contract that the audio-viewer enters into, agreeing to think of sound and image as forming a single entity” (Chion 1994, p.216). Building upon this notion, I suggest the concept of “interactive audiovisual contract” associated to an IAVO: a symbolic contract that the users enter into, agreeing to think that sound, visualization and GUI form a single entity – the IAVO.

Chion conceived a procedure to “analyze the sound-image structure of a film”, which he entitled “masking method” (Chion 1994, p.187). It consists in screening a certain sequence several times, “sometimes watching sound and image together, sometimes masking the image, sometimes cutting out the sound” (Chion 1994, p.187). In the questionnaire that was conducted in the present study, I have asked the respondents to apply this masking method to *AV Clash*, by comparing it to alternate audio-only and visual-only experiences of the project.

2.6.1 Visual feedback in audio software

In computer-based music production environments, visual feedback allows musicians to realize what is going on with the different components (Cronin 2008, p.77). This visual representation can help to quickly understand the value of a parameter, without the need of interacting with a control element. Traditionally, this visual representation has relied on metaphors from the music and studio hardware – for instance, knobs and faders. However, as Cronin explains, “recent innovations in musical user interfaces have broken from metaphors referring to our mechanical past to achieve many novel ways of providing visual feedback” (2008, p.77), and he cites some of the instruments within Native Instrument’s *Reaktor* package as examples of this approach. I consider that the IAVO, with its integration of GUI and sound visualization, is also an example of a novel way of providing visual feedback.

The *Reactable* is another example of the relevance of visual feedback for audio tools. *Reactable* has dynamic visual feedback capabilities: “auras around the physical objects bring information about their behavior, their parameters values and configuration states, while the lines that draw the connections between the objects, convey the real waveforms of the sound flow” (Jordà et al. 2007, p.142). Björk has used *Reactable* in her *Volta* tour (2007–2009), often projecting real-time images of the *Reactable* interface to the audience.

Reactable builds upon previous project *FMOL*, also conceived by Sergi Jordà. *FMOL* has a tight feedback loop (a “closed feedback loop”) between sound and graphics, integrating GUI, sound input and sound visualization: “the same GUI works both as the input for sound control and as an output that intuitively displays all the sound and music activity” (Jordà 2003a, p.3). The IAVO concept explored in Video Jack projects represents another attempt at integrating GUI and sound visualization, although the integration works by embedding the GUI in the visualization and by aesthetically harmonizing both. It is not as tight a feedback loop as in *FMOL*, since the IAVO GUI does not affect sound generation as deeply. But similarly to *FMOL*’s GUI, the IAVO “works both as an input devices (i.e. a controller) that can be picked and dragged with the mouse, and as an output device that gives dynamic visual feedback” (Jordà 2003a, p.3).

As Jordà states, an added benefit of visual feedback comes to light in performances, where the use of projectors connected to the performers’ computers “enables the audience to watch the music and how it is being constructed, giving the public a deeper understanding of the ongoing musical processes and adding new exciting elements to the show” (Jordà 2003a, p.3). I believe that this observation is also ap-

plicable to *AVOL* and *AV Clash* performances. Collins expresses a similar idea: “there must be a direct and comprehensible relationship between the controls we use and the sounds we hear”, adding with a touch of irony: “this would not be a bad thing from the audience’s point of view either” (Collins 2003, p.68).

Live coding is another strategy used for achieving visual feedback in performances. However, as Collins states, live coding often “cannot be interpreted by a lay audience, and, in some cases, not even the author follows everything going on in their chaotic dynamical systems” (Collins 2003, p.69). With the IAVO approach, I aim to achieve ease of interpretation, for the performer/user and also for the audience (in the case of performances).

2.6.2 Design of audiovisual systems

Levin uses Thomas Wilfred’s *Claviluxes* and Fischinger’s *Lumigraph* to illustrate the issue of remote and direct control over visual systems:

“Although both systems allowed a performer to perform patterns of light, Wilfred’s *Claviluxes* produced visual displays according to the remotely-controlled action of motorized mechanisms, while Fischinger’s simple latex screen directly and immediately conveyed the handmade and ephemeral markings of the performer’s gestures” (Levin 2000, p.28).

As Levin points out, the distinction between remote and direct control might be vague, since “any medium by its nature interposes a material or process between its performer and its product” (Levin 2000, p.28). Still, this distinction is relevant in the design of the IAVOs in Video Jack projects. In IAVOs, the GUI is embedded in the visuals, therefore providing a more direct control than a GUI that is separated from the visuals (for example, in a different section of the screen or in a different screen entirely). Another common element between the IAVO approach and Jordà’s *FMOL* is that they both offer to a certain extent a “direct control”. Both projects have all the control elements in the same window that is used for visual output, allowing to “modify the visuals window by playing directly on it” (Jordà 2003b, p.4), unlike VJ systems for example. Usually, VJ systems consist of two windows: “one for the visual output (or input, depending on the chosen approach) and an additional one (the ‘control panel’) for parameter modification” (Jordà 2003b, p.4). Even in *AV Clash*, which contains more elaborate control elements, the settings panel of an object can be accessed and modified while the object is playing, without leaving the same “main” window. In the questionnaire, I ask users if they consider this integrated approach to be positive.

Levin also discusses the GUI of graphic synthesizers, concluding that their “control-panel schema replicate all of the undesirable aspects of multi-knob interfaces – such as their bewildering clutter, their confusing homogeneity, and their unobvious mapping from knobs to underlying sound parameters – and none of their positive aspects” (Levin 2000, p.40). By aesthetically integrating the GUI with sound visualization, I aim to address the issue of “confusing homogeneity”, and facilitate a more readable mapping between sound and controller.

When listing design patterns for screen-based computer music, Levin identifies a pattern “built on the metaphor of a group of virtual objects (or ‘widgets’) which can be manipulated, stretched, collided, etc. by a performer in order to shape or compose music” (Levin 2000, p.41). I believe that Video Jack projects fit in this broad category of “interactive widgets”. Levin cites the example of *Stretchable Music*, a project that uses “different widget forms to represent different audio layers”, establishing “a personal yet consistent audiovisual context” (Levin 2000, p.45). I aim to achieve a similar result, namely with projects *AVOL* and *AV Clash*. However, Levin criticizes this type of projects, stating that “the most common disadvantage of ‘Interactive Widget’ systems is that their canned ingredients, all too inevitably, yield canned results” (Levin 2000, p.46). He identifies the problem in a “granularity” of control: systems which rely on entire musical passages and larger sonic elements or predefined geometries and images “restrict users to performance experiences which are ultimately exhaustible, or shallow, or both” (Levin 2000, p.46). Contrary to Levin, I believe that there is room for exploration in the “Interactive Widgets” category, leading to projects which may be neither exhaustible nor shallow – particularly when they are web-based, and capable of channeling a vast amount of resources from audio or visual Internet content repositories (as is the case of *AV Clash*), or allowing networked collaboration.

Reacting against CD-ROMs in 1996, Brian Eno proposes systems that dispense “with the awful tedium of interactivity” (Eno 1996, p.309). Eno suggests taking advantage of computational power, and create “something that you could, if you choose, just switch on and allow to free-run, confident that it would self-generate something worth watching” (Eno 1996, p.309). Inspired by Eno, I have added to *AV Clash* a “shuffle” feature, which allows for a randomization of sound, animation, and related parameters, with a single button press. While not as self-generative as Eno proposes, it creates more diversity out of less interaction than would be otherwise needed, aiming to avoid “interaction tedium”. In the questionnaire, I ask *AV Clash* users if they find this “shuffle” feature appealing.



Image from Master and Margarita

3 Conclusions

The conclusions are organized according to the research topics presented in the Introduction chapter (section 1.2). Conclusions are drawn both from reflections upon the practical work and from the user study. The user study was based on a questionnaire with close and open-ended questions, answered by 22 respondents, as presented in section 1.3. Project management conclusions are mostly reached from my own experience as author and manager of the projects. The conclusions have been grouped into six main topics: content, interactivity, experience, project management, methodology, and future developments. I consider the first three topics to be the most important ones, as they directly address the main research question. Conclusions relate mostly to *AV Clash*, and also to *AVOL* and *Master and Margarita*, and to a lesser extent to *Heat Seeker* (which was not included in the questionnaire). “Video Jack projects” will refer to these four projects.

3.1 IAVO approach and project development path

The practical component of the research provides a partial answer to the main research question. I propose an IAVO (Interactive AudioVisual Object) approach to create projects for integrated audiovisual art that are coherent, flexible, easy to use, playful and engaging to experience. IAVOs expand on Michel Chion’s notion of *synchresis* – the forging between something one sees and something one hears (Chion 1994, p.224) – by integrating interactivity into audiovisual modules, aiming to build a cohesive entity. This integration is functional and aesthetic. Functionally, the GUI controls sound and visuals, while visuals provide feedback on the audio. Aesthetically, the GUI is embedded in, and in harmony with, the visualization. The combination of the different IAVOs within a project aims to create a coherent whole, where the manipulation options afforded by the GUI allow for numerous variations of the audiovisual content (Figure 25).

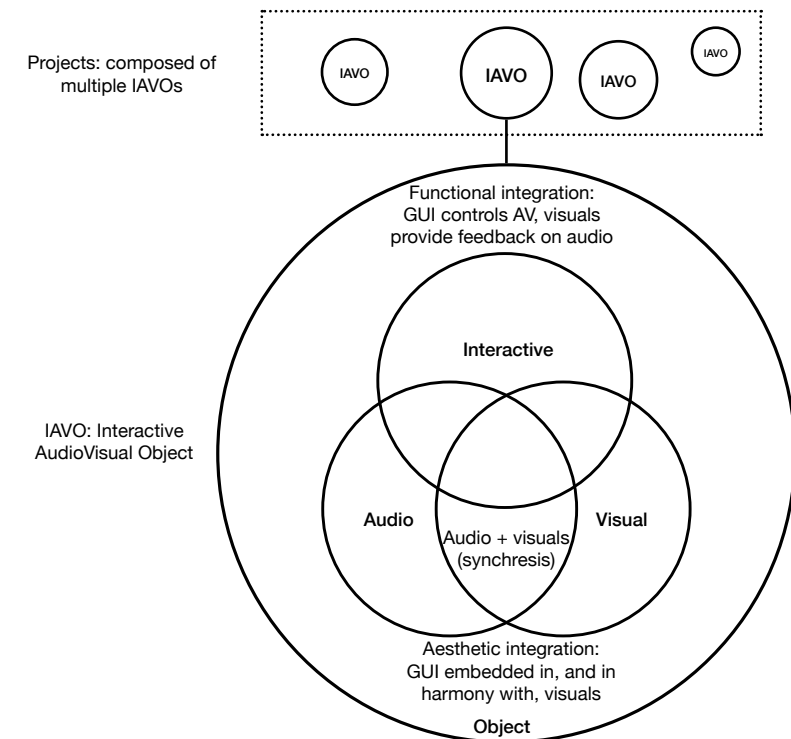


Figure 25. IAVO as functional and aesthetic integration of audio, visuals and GUI

That approach has been developed in iterations, oscillating between an abstract and narrative style, with more manipulation options and modular content being added in each iteration (Figure 26). I believe that the latest project in this line, *AV Clash*, is the most accomplished materialization of this approach. The questionnaire aimed to gain insights from users regarding the assumptions I took in these iterations, and it helped me shape a new understanding of the projects – such as revealing negative elements in *AV Clash* and positive elements in *AVOL*, which were absent from my earlier views.

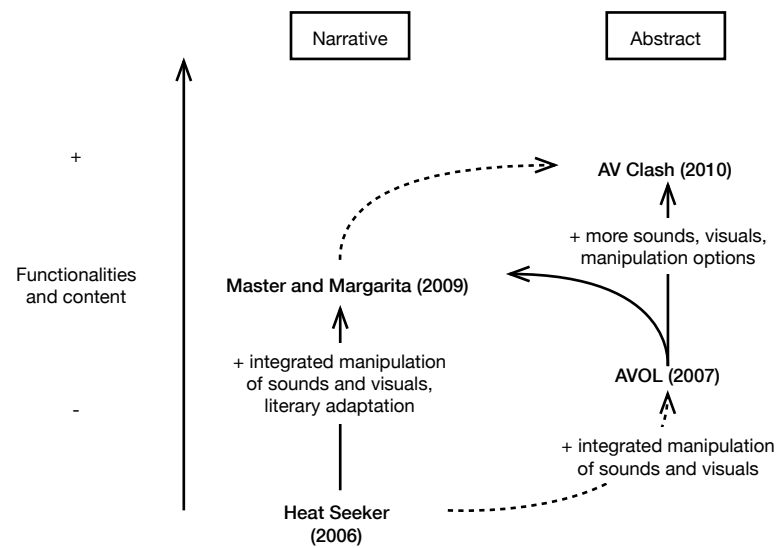


Figure 26. Iterations of Video Jack projects

The practical work has been extensively showcased in public, through more than 20 performances and exhibitions in festivals and venues dedicated to new media arts in 16 countries (Annex 1). It is available to the general public in the Internet (Annex 2), with *AV Clash* in particular having received a relatively high number of visits (Annex 3), as have the project videos published online (Annex 2). The projects have received press coverage by specialized media (Annex 2).

Conclusions regarding the three main research topics – content, interactivity and experience – complete the answer to the main research question.

3.2.1 Sonic and visual content

Nine of the 22 test users prefer the sound and music approach of *AV Clash*, against seven who prefer the approach of *AVOL*, with six enjoying equally both. The test users who preferred the sounds in *AVOL* stated that the synchronization of the loops, the fact that the sounds were curated, and the inclusion of percussive elements were factors for their choice. Three of the test users who preferred *AV Clash* mentioned the variety of sounds (and another one mentioned its lack in *AVOL*), while two mentioned the higher level of control as reasons for their preference. Another respondent preferred the sounds in *AV Clash* because they were “more abstract and neutral”. One of the users who enjoyed equally both mentioned that while *AVOL* offers more harmony due to its pre-selected set, *AV Clash* offers more variety. An additional respondent who also manifested equal preference mentioned that *AVOL* was better for rhythm due to loop synchronization, while for other type of sounds *AV Clash* was preferable, because of its larger amount of content. One user preferred *AVOL* due to the larger number of control possibilities, which reveals there were aspects of *AV Clash* that remained undiscovered (since it is the latter that offers more control functionalities). The evaluation reveals that although more users prefer a larger quantity and diversity of audio content (as in *AV Clash*), a significant amount of users would rather deal with a smaller and more curated selection (as in *AVOL*).

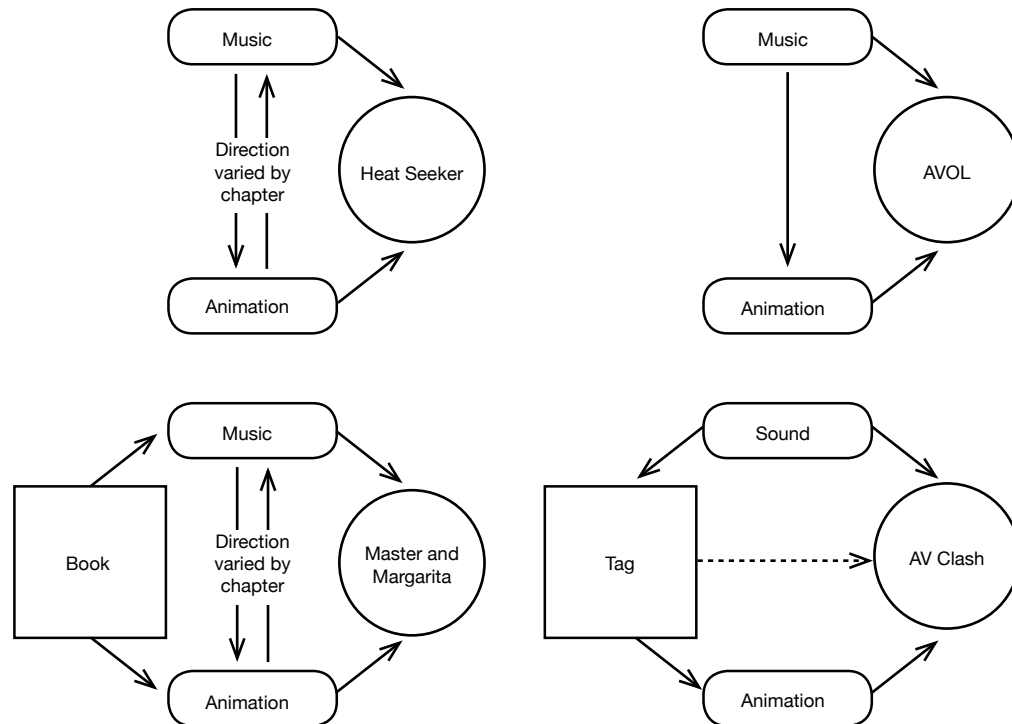
One of the main aims of *AV Clash* was to increase substantially the number of sounds and visuals that could be accessed, compared to *AVOL*. One of the sections of the questionnaire concentrated on this aspect. 15 respondents consider that the possibility of accessing a larger amount of content in *AV Clash* than *AVOL* is appealing, against six who do not (one user is indifferent). 12 respondents answered that both visuals and sound in *AV Clash* are sufficiently diverse to maintain interest for a satisfactory amount of time.

Although more respondents (12) prefer the abstract visual style of *AV Clash* compared to the figurative visuals of *Master and Margarita*, a still significant number (eight) showed preference in the latter. The results of the questionnaire reveal that users seem to be interested not only in purely abstract visuals but also in figurative animation in audiovisual projects. This contradicts the views of some visual music authors, such as Oskar Fischinger, for whom purely abstract animation is a preferred form of sound visualization. These results reaffirm that there is a space in new media art for figuration, echoing Manovich’s observations regarding the potential for representational media using software art, instead of what he considers to be a prevalent abstract “soft modernism” approach (Manovich 2002a, pp.13–16).

3.2.2 Adaptation

I consider that the adaptation approach that was followed in *Master and Margarita* was successful in harmonizing sound and visuals. This opinion was echoed by one of the respondents in the questionnaire, when asked why she/he preferred the visuals of *Master and Margarita* to *AV Clash*. In my opinion, the relationship between audio and visuals in *Master and Margarita* was reinforced by drawing influence not only from each other, but also from an external element – in this case, a novel. The adaptation was a mediator between music and visuals: both are bound together by the novel. The adaptation follows the spirit of the book, borrowing elements instead of fully adapting it. The multilayered style of the novel, with metaphorical elements that need to be decoded to acquire meaning, is matched by the multiple levels of symbolic content of the audiovisual project. I believe that this approach also allowed for a more personalized and distinctive result. To a certain extent, the tags in *AV Clash* fulfilled the mediator role between sound and visuals in that project, although in a much more simplified way that the novel did in *Master and Margarita*.

Figure 27. Direction of influence between sound and visuals in the development stage of projects



Video Jack projects have followed different approaches to the process of interpreting audio to visuals and vice-versa. Typically, in music videos the image follows the sound, and “the director normally designs images with the song as a guide” (Vernallis 2004, p.x). In Video Jack projects there is no unique solution adopted. In *AV Clash* there is a clear sequence – the visuals were influenced by the pre-existent sounds (or better yet, by an abstraction of certain types of sound, conveyed by the chosen tags). In *Master and Margarita* the sounds were initially influenced by the visuals (additionally to the novel), while on a second stage the sounds were developed earlier, therefore affecting the development of the animations. It can be said that there was a mutual influence between animation and sound in *Master and Margarita* (Figure 27).

3.2.3 Integration of sound and visuals

AV Clash seems to have been more successful than *Master and Margarita* and *AVOL* in the integration of sound and visuals – according to 14 and ten respondents, respectively. The vast majority of the respondents (20) consider the visuals of *AV Clash* well suited to the sound. The results of the evaluation reveal that, regarding *AV Clash*, the combined use of audio and visuals leads to more satisfactory results than the isolated experience of one of these elements – 16 test users consider that the sound adds to the enjoyment, compared to a purely visual experience, while 19 respondents consider that the visuals add to the enjoyment, compared to a purely sonic experience. This leads to believe that the project has achieved an added value through the integrated use of audio and visuals, where both elements have been mutually enriched. According to Chion’s definition, added value functions reciprocally: “sound shows us the image differently than what the image shows alone, and the image likewise makes us hear sound differently” (Chion 1994, p.21).

I also wanted to question the fundamental approach for this study of combining audio and visuals, by asking test users if this combination limits their imagination in *AV Clash*. The majority of the respondents (15) considered that it does not. These results conform to Nicholas Cook’s observations when presenting his concept of “music film”, a genre in which “the relationship between sound and image are not fixed and immutable but variable and contextual, and in which dominance is only one of a range of possibilities” (Cook 2000, p.214). Citing *Fantasia* as an example, he considers that in this genre the limits are not set by the director or the composer, but by anybody who watches and listens to the work (Cook 2000, p.214).

3.2.4 Vectors and loops

The use of vector animation modules (animation loops) in Video Jack projects has led to positive results in terms of the manipulation capabilities of these elements, and their optimized performance, particularly on the web. Vector graphics are scalable and light (when created in order to avoid excessive detail, as in Video Jack projects). This allows for a fluid responsiveness to interaction, and for a quick loading of new modules via the Internet.

Animation and sound loops can be seen as the basic structural elements of Video Jack projects, allowing for multiple audiovisual combinations. Video Jack projects fit into a cultural context where the loop is the “the basic building block of an electronic sound track” and have also “conquered surprisingly strong position in contemporary visual culture” (Manovich 2002a, p.2). In *AVOL* and *AV Clash*, animation and sound loops are matched together (and in *AV Clash* this mapping can be reconfigured by users, although only to a certain extent, constrained by the tag), whereas in *Master and Margarita* the matching only occurs partially – there are (non-IAVO) animation loops that have no audio equivalent.

3.3 Interactivity

3.3.1 Interactivity versus automatism and linearity

The triggering of different loops in IAVO-based projects leads to the creation of a diverse sonic and visual landscape. However, Video Jack projects usually demand an intensive interaction in order to obtain substantial changes in this landscape. Without further interaction, the audio and visual loops will go on indefinitely unchanged. Brian Eno advocates the creation of audiovisual systems that one could just “switch on and allow to free-run, confident that it would self-generate something worth watching”, dispensing with the “tedium of ‘interactivity’” (Eno 1996, p.309). The “shuffle” and “cycle” functionalities in *AV Clash* were attempts to allow for a less intensive interaction, which would not be “tedious” as Eno states.

The study suggests that users are more interested in intensive interaction than in randomization mechanisms, contradicting Eno’s views. Only five respondents used the “shuffle” button, and only seven showed interest in more automatic features that would reduce the need for interaction. Regarding the issue of interactive versus linear content, the vast majority of the respondents (19) prefer to interact with sounds and visuals in *AV Clash* than to listen to linear sound recordings or watch linear videos based on the project.

3.3.2 IAVO approach and flexibility

The results of the evaluation show that the vast majority of users are pleased with the IAVO approach of integrating the user interface with the respective audio-reactive animations. 19 of the test users consider that the integration of the interface elements with the animations is positive, and 18 consider to be positive that all the elements of the project are consolidated in the same area of the screen (unlike software for VJing, for example, usually split in two areas or screens: one with the interface and another with the outcome).

Regarding manipulation options, it is difficult to reach a balance between number of functions and ease of use, since “the number of controls and complexity of use is really a tradeoff between two opposing factors” (Norman 2002, p.209). *AV Clash* seems to have achieved that balance, with the majority of the test users (12) considering that the amount of audio and video manipulation functionalities is neither too much nor too little. The majority of users (12) also find the additional audio manipulation options in *AV Clash*, comparing to *AVOL*, interesting. However, a significant minority of respondents (six) still considers that there are too many options in *AV Clash*, and some manifest preference for a simpler project such as *AVOL*, while some other users (four) consider that there are too few options in *AV Clash*.

3.3.3 Ease of use and explorability

Video Jack projects aim to stimulate curiosity and the will to explore of users, enticing them to try out different content and manipulation options. This follows the views of Donald Norman regarding explorability, that “one important method of making systems easier to learn and use is to make them explorable, to encourage the user to experiment and learn the possibilities through active exploration” (Norman 2002, p.183). Although the majority of test users of *AV Clash* (12) interacted with the project by autonomous exploration, a significant number of users (ten) considered that it was not enough to simply explore without reading instructions. Moreover, results also show that test users who have spent less time with the project may be less satisfied with the amount of sounds and visuals in *AV Clash*, and may have not discovered all the available content.

Half of the respondents consider the interface of *AV Clash* to be unclear, and usability issues are further mentioned by respondents in open-ended questions, even ones unrelated to this topic. The study suggests that adding content brings a need for further facilitation of discovery and navigation of the content, and that *AV Clash* was not entirely successful in this respect. Despite aiming to be easier to use than *AVOL*, *AV Clash* reaches the same results in terms of ease of use as the former project: eight test users consider *AV Clash* more intuitive, while the same amount of users chose *AVOL* regarding

this topic, and six answer that both projects are on the same level. When asked the reasons behind their choices, six out of the eight users who considered *AVOL* more intuitive mention the simpler interface and fewer options as the reasons for their choice. Three of the users who found *AV Clash* more intuitive manifested preference in the UI of the project. Therefore, I consider that the aims of allowing for ease of use and explorability in *AV Clash* were not totally achieved.

3.4 Experience

3.4.1 Engagement and playfulness

Video Jack projects aim to engage their users with a successful integration of sound and visuals, together with an expressive, playful and easy to use interaction. Video Jack seek to pass part of the authorial decisions to their audience. In these projects, users are given access to the same tools that Video Jack use in their performances, allowing for the creation of personal performative experiences. In that sense, Video Jack web projects function similarly to what Stockburger has identified as an “audience of one” (referring to sound games): different roles – composer, performer and audience – converge in the user (Stockburger 2009, p.122). Additionally, Video Jack projects aim to create a coherent experience, from the pre-loaders of the projects and their chapter menus (in the case of the narrative projects) to the aesthetic integration of GUI with the animations.

In order to assess the engagement with *AV Clash*, elements such as time, intention of reusing the project, feeling of fun and creativity – in isolation or in comparison with *AVOL* – can be important criteria. In the evaluation of *AV Clash*, the vast majority of respondents (20) stated that they would use the project again. The majority of test users (16) have also spent more time interacting with *AV Clash* than with *AVOL*. The vast majority of respondents (20) stated they had fun with *AV Clash*, with ten stating that they had “a lot of fun”. When asked to comment on the overall experience of playing with *AV Clash* in an open-ended question, approximately half of the respondents mentioned the fun and playfulness aspects of the project, with nine of the respondents using the word “fun” and an additional one the word “playful” to describe it. Three of the test users considered it technical and more oriented to professionals, while another one considers it geared towards the more amateur “home DJ”. Two of the respondents consider it to be immersive or engaging. Two users described it as “surprising”. Yet another one described it as “meditative”.

The majority of test users (17) answered that they felt creative while using *AV Clash*. 13 respondents considered that *AV Clash* contributed to a higher feeling of creativity than *AVOL*, whereas two respondents chose *AVOL*. Five test users answered that both were equal regarding this issue, and two answered that they do not get a feeling of creativity from either. Of the 13 respondents who consider that *AV Clash* gives a greater feeling of creativity than *AVOL*, seven mention more control or more options, and one respondent mentions more variety in sound, as the reasons for their choice. One of the respondents who answered that both projects give the same feeling of creativity considers that both projects shape the sound and visuals too much to allow for their own creativity. One of the users who did not get a feeling of creativity from either mentions that both projects are “too structured” to allow for creativity. One of the two test users who consider *AVOL* to offer a more creative experience mentions that the selected sounds “fit together nicely”, adding that switching between them created interesting results.

Only a minority of respondents (8) consider they are creating their own work, and a few users consider both *AV Clash* and *AVOL* to be excessively “structured”. In an answer to a previous open-ended question (regarding interactivity), one test user provides important clues for explaining these results: she/he was dissatisfied with *AV Clash* being neither a tool (“I can’t make a song or video with it”), nor a game (“you can’t win, no goal”). Despite the improvements made relatively to *AVOL*, *AV Clash* was more successful in the user study in aspects related to fun than to creativity. More could be done for *AV Clash* to become a tool for creative purposes, in terms of content customization (particular on the visual side), amount of manipulation options, and recording functionalities.

3.4.3 Tool or soundtoy?

Lily Díaz defines tool as “an artifact created for the purpose of changing the environment and facilitating adaptation and survival” (Díaz-Kommonen 2002, p.61). According to the same author, tools can be of a tangible nature (for example, brushes or canvas) or of an immaterial nature, “as is the case with methods that are learned through education” (Díaz-Kommonen 2002, p.77) and software. Despite the high results achieved for *AV Clash* in the questionnaire regarding “feeling of creativity”, I do not think I have built a tool in a larger sense, for affecting the environment – in this case, meaning a tool for the performance or production of audio and visuals for interested users (and not just for Video Jack).

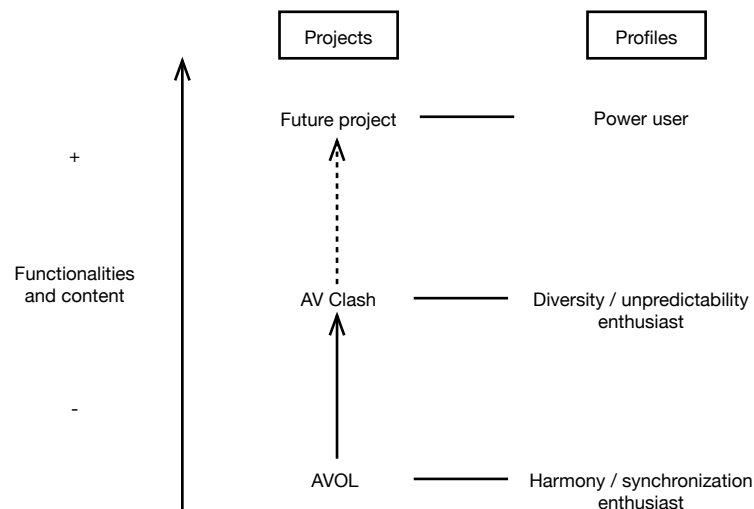
In my opinion, there are two factors that would “promote” *AV Clash* to being a tool: 1) adoption – performers other than Video Jack adopting *AV Clash* for their performances; 2) creation of outcomes – adding functionalities to *AV Clash*

that would allow to transform the usage of the project into an outcome (a video, a sound file), and not simply a volatile experience, enabling users to share or showcase this outcome as having been co-created by them. The results of the questionnaire show that there has been an evolution in *AV Clash* regarding *AVOL* towards this goal, since it seems to allow for a greater creativity. Nonetheless, I believe that both are still in the “soundtoys” category of projects defined by Stanza: “new audio visual experiences” or “multimedia experiments which explore the parameters of our new media world” (Stanza 1998b).

3.4.4 Different segments detected

The results of the questionnaire suggest that there is no unique ideal approach for creating an engaging experience with interactive audiovisual projects. Some test users prefer a purely abstract approach, while others prefer abstraction mixed with figurative elements. Most test users prefer a larger amount of sounds, with large diversity of styles, while a still significant amount of users prefer a smaller, more curated selection and a more harmonious content. Most respondents value more content manipulation options, while others show preference for a smaller set of controls that are easier to explore.

Figure 28. Profiles of users identified in the study



A segmentation of users should be achieved, to target differently future audiovisual projects. The results suggest that there are three profiles of users: those who are satisfied with the variety of content and manipulation options of *AV Clash* (the “diversity / unpredictability enthusiast” group, the majority in this study); those who prefer the simpler approach of *AVOL* (the “harmony / synchronization enthusiast” group); and those who find both projects too structured and wish for a higher flexibility (the “power user” group). I plan to address the issues raised by the “power user” segment (Figure 28) in a future project, which I would like to be more of a “tool”. These segments should not be considered too strictly, as some of these profiles may coexist in the same user, depending on context.

3.4.5 Summary regarding experience

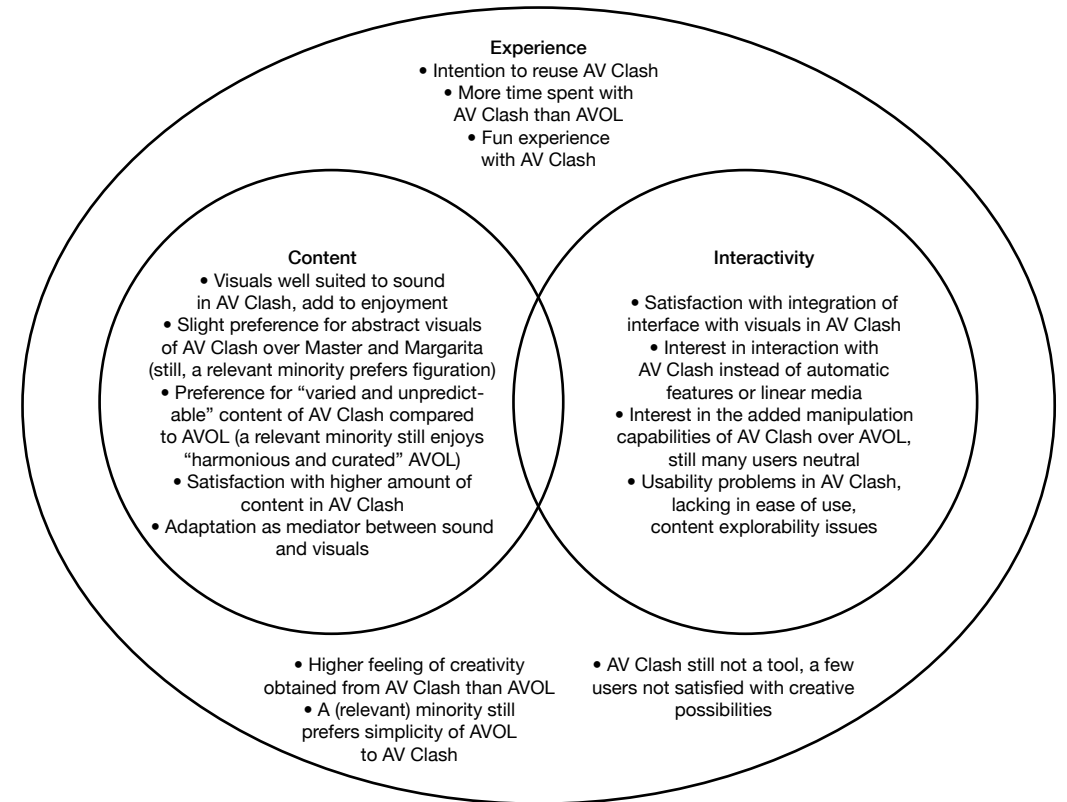


Figure 29. Summary of the questionnaire results related to experience, content and interactivity

Experience encompasses all elements of the project, including content and interactivity. This section discussed in particular results related to experience that had not been analyzed in previous sections. Figure 29 summarizes the results in this section, in addition to the ones from the previous two sections (related to content and interactivity), aiming to create a broader image of the user experience with *AV Clash*, as revealed by the questionnaire. The diversity of the results confirm that taking into an account an experience focus, as Kaye et al. advocate (2007, p.2118), is fruitful in order to evaluate a new media art project such as *AV Clash*.

3.5 Project management

3.5.1 Cross-platform spin-offs

One of the distinctive aspects of Video Jack projects is that they have been presented in different platforms. The technology adopted for the development of the projects (Adobe Flash) allows for easily converting projects from performance to the web, and videos have been recorded of all Video Jack projects. That has allowed for the projects to be presented in different platforms, aiming to reach as vast an audience as possible: *Heat Seeker* has been showcased as performance, DVD screening and net art project; *AVOL* and *AV Clash* as performance, interactive installation and net art project; and *Master and Margarita* as performance and net art project. *Heat Seeker* videos were originally released commercially in Portugal in a DVD, but meanwhile I have realized that, with the emergence of platforms such as YouTube and Vimeo, the web could replace physical media a platform for the project videos. Still, a DVD of *Master and Margarita* was created for promotional purposes. With these spin-offs, I aim to propagate the experience of a project through different platforms (linear video and audio, web, performance and installation) in a coherent way. *Heat Seeker*, for example, challenged the concept of the traditional album with its cross-platform approach: it was released as a CD together with a DVD, containing music videos to all the CD tracks. The music videos were built with the same software and animation blocks used for creating the visuals in performances, and all the tracks were later released as online “interactive music videos”.

The projects have had different paths in terms of spin-offs. *Heat Seeker* and *Master and Margarita* started as performance projects, and were later converted to the web and video. In the case of *Heat Seeker*, those videos have been shown as screenings in festivals. *AVOL* and *AV Clash* have started as web projects, and were later showcased as performance and installation (Figure 30). Video versions have been also made of these projects. As mentioned previously, *AV Clash* videos were prepared for its launch, whereas *AVOL* videos were created much after its launch.

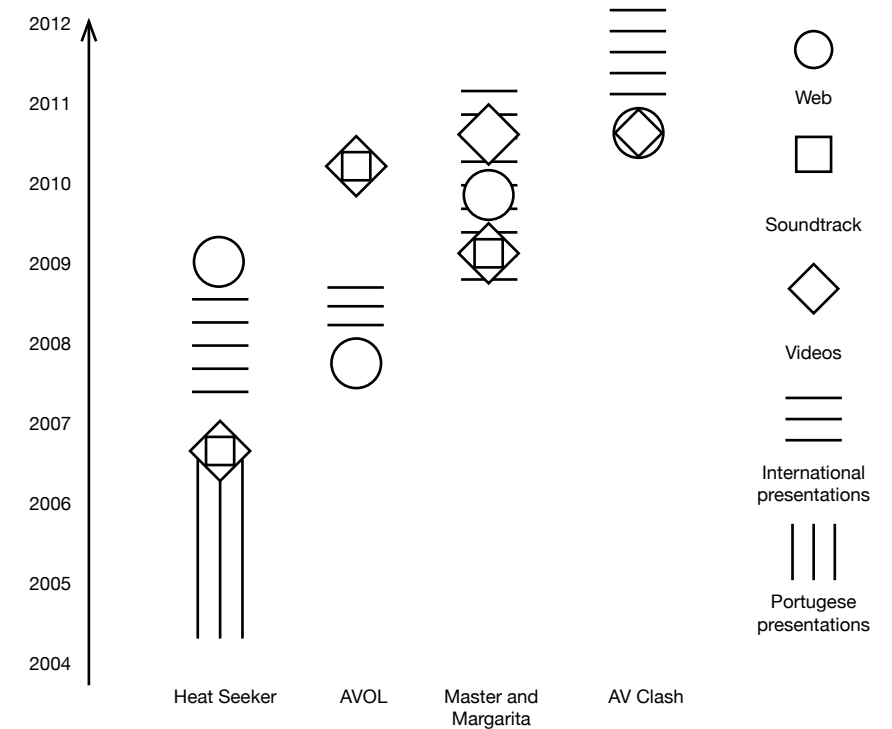


Figure 30. Paths of project spin-offs

Although aspects related to performance are out of the scope of the present study, the presentation of Video Jack projects as performance provided some useful insights. One of the idiosyncratic elements of Video Jack performances is that the interface is visible to the audience, as part of the projected visuals. The cursor is visible at all times, and by following it the audience can relate to the decisions being made by the performers. This contributes to Video Jack’s aim of transparency – that is, to allow the audience to perceive the content triggering and manipulation that the performers are

executing. Showcasing the interface also aims to contribute to a feeling of authenticity that the audience craves in a live performance: “the desire for the visual mark (and proof) of authenticity”, according to Grossberg (1993, p.204). Showcasing the GUI to the audience in audiovisual performances is not common. Feedback gathered informally after the performances revealed that this decision is quite divisive – some audience members like the approach, and find it appealing to follow what the performers are doing, while others find it distracting and unaesthetic. This issue deserves further research.

The pursuit of transparency through the showcase of GUI relates to Bolter and Grusin’s “double logic of hypermediacy and immediacy”, where “our culture wants both to multiply its media and to erase all traces of mediation: ideally, it wants to erase its media in the very act of multiplying them” (Bolter & Grusin 2000, p.5). In Video Jack’s performances, the immediacy is achieved by having the audience see a representation of the performer’s actions on the screen via the cursor activating the GUI (what the audience sees is what the performers see and do); on the other hand, these elements contribute to a hypermediated saturation of elements, on top of an already multi-layered audiovisual content. Video Jack aim to immerse the user in the experience of the performance with this audiovisual saturation, while keeping her/him aware how the process is being constructed in real time.

In our performances, we require that the projection be situated behind us, slightly above, so that we are located in the same field of vision as the projection. The objective behind this is, again, to contribute to authenticity – giving a reassurance that a spontaneous live performance is taking place, with a certain degree of uncertainty and improvisation, and that there is a connection between the manipulation being executed by the two performers with their laptops and the projection above. More could be done to better integrate the actions of the performers with the visuals and further showcase their interactions on stage. I feel that the gestures of the performers are still too subtle for the audience to adequately perceive their effect in the audiovisual result. This should be explored in further work.

I consider that the narrative projects are more engaging than the abstract ones as performance, since the former were created originally for the stage and later adapted to the web, while the latter were originally meant for the web. In three occasions, performances included both types of projects. Informal feedback gathered after these performances, regarding preference for abstract or narrative projects, was inconclusive. More could be done in the future to formally collect feedback from Video Jack performances.

Music is an integral component of Video Jack projects, and project soundtracks composed by me have become an im-

portant spin-off. Video Jack projects present a different way to distribute my own music, and to promote the music as soundtracks. In recent years, the web has become a major point of access for music consumption, with more than 660 million digital songs sold in the first semester of 2011 in the USA alone (Empson 2011). Music/music video streaming on websites such as SoundCloud, Spotify and YouTube has become extremely popular. The web versions of the projects have opened up an audience to my music that may not have discovered it otherwise.

In the course of the study, I have been reflecting that research itself has become a part of this project spin-off logic. Each project has originated at least one paper, and these papers can be thought of “meta spin-offs” of the projects. This methodological reflection is something I would like to investigate more after the conclusion of my study – practice-based research as an additional extension of a project, within a cluster of spin-offs.

3.5.2 Promotion

I have been responsible for the promotion of Video Jack projects. The promotion of *AV Clash* seems to have been successful, as the project was visited more than 8.000 times during its launch month, and had more than 20.000 visits in the first year since its launch (see Annex 3), considerable more than previous Video Jack projects. A few lessons have been learnt regarding the promotion of net art projects, since the release of our first major one – *AVOL*.

Firstly, I decided to redesign the Video Jack home page after the release of the online version of *Heat Seeker*. I wanted to have a common entry point to Video Jack net art works, which would be aesthetically harmonious with them, providing an “umbrella” for the experience of the different projects. The home page should allow access to project spin-offs and their documentation, providing other means of experiencing each project and learning more about it, such as: embedded videos, soundtracks, images, documentation of events and explanatory texts.

Secondly, I decided to release *AV Clash* only after having all promotional materials available (videos, images and text). Prior to the launch, I collected images and recorded videos of *AV Clash*, in order to embed them in the Video Jack home site, and spread them throughout our social networks. I believe that this approach, particularly the recording of videos, maximized the impact of the promotion. Based on my informal observation, users often view an introductory video of a web project before deciding to commit time to interacting with it – this introductory video is often the user’s first contact with the project. Additionally, having the videos available facilitated the promotion of *AV Clash* by blogs and other online media. This strategy was apparently successful, as *AV Clash*

received specialized media coverage on the web. These web articles embedded videos of the project.⁴⁰ The five videos of *AV Clash* posted on Vimeo, for example, reached nearly 8000 views.⁴¹ Prior to *AV Clash*, the videos and web version of each project were released in different occasions (Figure 30).

Thirdly, I believe that social networks should be leveraged to promote net art projects, and collect feedback – not only generic social networks such as Facebook or Twitter, but also specialized ones such as Vimeo. They can help spread the project further, and provide an introduction to the project via video embedding. Besides promoting the project, social networks allow the artists to collect valuable feedback and engage with their audience. Some of these networks, such as Twitter, allow for specific searches to be executed, which can be useful to locate spontaneous feedback to the project. I conducted searches on Twitter (for example, by using the search term “avclash”), and occasionally replied to the feedback, originating a fruitful discussion with users.⁴² I have also used website analytics software to detect which sources were being used to access *AV Clash*, and in some cases contacted those sources thanking for the exposure granted. Spontaneous feedback collected from these searches could be further analyzed in the future. Both *Master and Margarita* and *AV Clash* contain links to easily share the project on social networks or by email. StumbleUpon has been very successful in driving web traffic to *AV Clash*, although that has happened without my direct intervention, but due to the “viral” nature of the recommendation mechanisms of the service (see Annex 3).

A more institutional form of promotion is directed to new media art festivals and calls for project submissions. I consider that it is useful to gather all the material usually requested by these festivals in one document, which can be easily reformatted to suit their requirements. I have created one such document for all Video Jack projects, including: artist biography and CV; project synopsis; credits and acknowledgements; project images; technical requirements; previous presentations; press clippings; and prizes won (if applicable). Having these materials ready has helped me submit to more festivals, leading to the relative success of Video Jack projects in international new media arts festivals and exhibitions: more than 20 presentations in 16 countries within approximately five years, with four projects (see Annex 1).

40 A selected list of press coverage to *AV Clash*, from websites such as Creative Applications Network, Create Digital Motion, The Creators Project, The Awesomer and Gearfuse can be found at: <http://www.videojackstudios.com/press/av-clash-press/>

41 As of 18 May 2012; most of the views were achieved in the weeks following the launch of the project.

42 Links to the results of these searches on Twitter can be found in this webpage (at the bottom): <http://www.videojackstudios.com/press/av-clash-press/>

I have been gathering video and/or photo documentation of all presentations of Video Jack projects.⁴³ I believe that Video Jack presentations, as performance or as exhibition, constitute an additional tool to promote the project – by means of the promotional material leading to it, and the diffusion of presentation material afterwards – mostly on social networks. It also adds value to our website, where this material is embedded. Although the quality of this documentation is often lower than screenshots or screen recordings, it shows the project in a different light – in the “real world” – with people interacting with the projects or watching them.

3.5.4 Technical issues

All Video Jack projects were developed using Adobe Flash. Flash proved to be a flexible tool, despite some performance issues – it is resource intensive, and its audio side is not very powerful, compared to other development tools. We have chosen Flash as performance tool for these projects since it is optimized for vector animation; it has a powerful scripting programming language; it has a satisfactory audio engine; and it allows for the development of projects that can be used both as performance and as web projects. However, multi-touch mobile devices have recently become important entry points to the web, and a considerable proportion of these devices (namely Apple iOS ones) cannot access Flash content – a decision made explicit by Steve Jobs with his “Thoughts on Flash” note (Jobs 2010). HTML5 and JavaScript have become an important alternative to Flash in terms of combining vector animation, sound and programming on the web (a trend which will intensify in the near future). The next Video Jack projects for the web will probably be developed using HTML5 and JavaScript instead of Flash.

3.5.5 Copyright issues

In terms of copyright policy, Video Jack have moved to a Creative Commons license with *Master and Margarita*: attribution, non-commercial, share alike license.⁴⁴ A similar license was used for *AV Clash*, but without the share alike condition.⁴⁵ The objective behind using this license is to allow the audience to reuse images and sounds from these projects, provided they mention their authors, and that they do not use the end result for commercial purposes. This way, users can create their own videos, for example, by using screen-recording software. By making the Creative Commons license explicit in *Master and Margarita* and *AV Clash* (*Heat Seeker* and *AVOL* omitted copyright information), I intended to encourage the recording by users of their manipu-

43 Documentation of these presentations can be found at <http://www.videojackstudios.com/c/events/>.

44 <http://creativecommons.org/licenses/by-nc-sa/3.0/>

45 <http://creativecommons.org/licenses/by-nc/3.0/>

lation of the projects. A few user videos have already been recorded, and posted to Video Jack's Facebook page.⁴⁶ I intend to further facilitate and promote user-generated content in future projects, and the non-commercial restriction might be dropped. I believe that facilitating the creation of user-generated content leads to a more satisfactory and engaging experience. It should also be noted that, at the time *AV Clash* was launched, most sounds in Freesound.org followed a "sampling+" Creative Commons license (similar to an attribution license)⁴⁷, and sounds imported from Freesound.org to *AV Clash* are dully attributed.

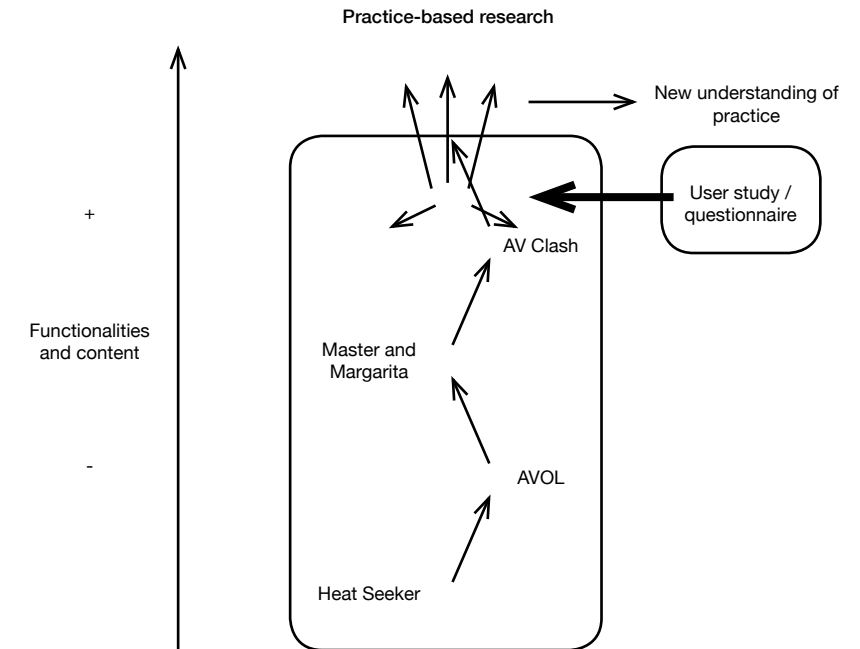
3.6 Methodology

The approach of complementing the main methodology – practice-based research – with a user study based on a questionnaire was fruitful. Practice-based research allowed me to develop the line of projects taking into account my own perspective as user and designer. The user study allowed me to compare my own initial conclusions with the perspectives of users of the projects, via an online questionnaire. Many of my initial conclusions were confirmed by the respondents, while others were not, originating useful insights – for example, the desired usability improvements in *AV Clash* regarding *AVOL* were not fully achieved, according to the results of the questionnaire. The approach followed in the questionnaire, of drawing inspiration from experience-focused HCI literature, allowed me to go beyond usability concerns and into other relevant aspects for the evaluation of new media art projects, such as engagement, fun and creativity. The structure of the questionnaire, organized in sections focusing on the core research topics of the study (content, interactivity and experience, as presented in section 1.2), allowed for a wide range of insights, and might be useful for future research.

46 <http://www.facebook.com/videojackstudios>

47 <http://creativecommons.org/licenses/sampling+/1.0/>

Figure 31. New understanding of practice resulting from user study



The questionnaire changed how I view my work and the development path of my projects. My initial assumption, that increasing content and functionalities while maintaining usability concerns would lead to higher user satisfaction, was not entirely correct (at least according to a significant amount of respondents). The user study made me question paths for future developments – options such as simpler projects with fewer functionalities but better usability, or creating hybrids of my figurative and abstract projects, became more attractive. From a linear “ascendant” view that oscillates between narrative and figurative projects, I have created a more multi-directional view of possible future work (Figure 31). In the future, I intend to conduct face-to-face interviews with users of *AV Clash* to achieve further insights on the project that might have not been possible to obtain with a questionnaire.

In my opinion, the relatively limited number of respondents (22) is due to the length of the questionnaire (81 questions, including 13 open-ended ones), and its broad scope – respondents were required to have interacted with three projects (*AVOL*, *Master and Margarita* and *AV Clash*). The answers to the questionnaire might also be skewed in favor of *AV Clash*, since it was the most recent project, and the focus of most of the questions.

One important angle was left out from the questionnaire – a comparison between the two narrative-based projects, *Heat Seeker* and *Master and Margarita*. This comparison could have evaluated if my assumptions regarding the improvements introduced in *Master and Margarita* relatively to *Heat Seeker* were fulfilled. I decided to leave *Heat Seeker* out of the questionnaire, and focus on the later projects, with an emphasis on *AV Clash*, in order not to increase even further the scope and number of questions. In retrospect, a separate questionnaire could have been launched to focus on this comparison.

The present research confirms that user studies can be effective in interactive arts projects to ensure that the interaction works as intended, as Höök et al. state (2003, p.248). Additionally, I suggest that user studies can be useful also to investigate if a project works in new ways, which were not intended. I consider that this alternative usage or “hackability” might be attractive to users, although this deserves further investigation. I have observed one example of this behavior, of subverting the intended use and trying to push the project to its limits, in one of the *AVOL* exhibitions, and documented it on video.⁴⁸ The user was deliberately creating an overload of IAVO collisions by dragging objects on top of each other, creating a cacophony of sound. This later inspired me to emphasize object collisions in *AV Clash*.

The practice-based approach undertaken, taking into account a line of projects following an incremental path, helped me to develop works that were easily comparable. This approach allowed for testing the iterative validity of the changes introduced. However, this iterative development might have prevented me from taking bigger creative leaps, and more radical transformations from project to project. Practice-based research, in my opinion, has the benefit of allowing for consistency and cohesiveness across projects in the same line of development. But it comes with a cost: the freedom to take sharper turns and to try radical approaches, since that would probably lead to a set of projects that would be more difficult to connect theoretically and to compare with each other.

3.7 Future developments

Some of the most important future developments for test users are related with the recording and sharing of content. I consider that this is a major insufficiency in *AV Clash* (and the projects that precede it): users have no built-in possibility to record an interaction session with the project, and share it with others. This should be a priority in future Video Jack projects. Additionally, as discussed above, sharing via social networks can be effective in terms of promotion and gathering feedback. A special forum (for example, a dedicated

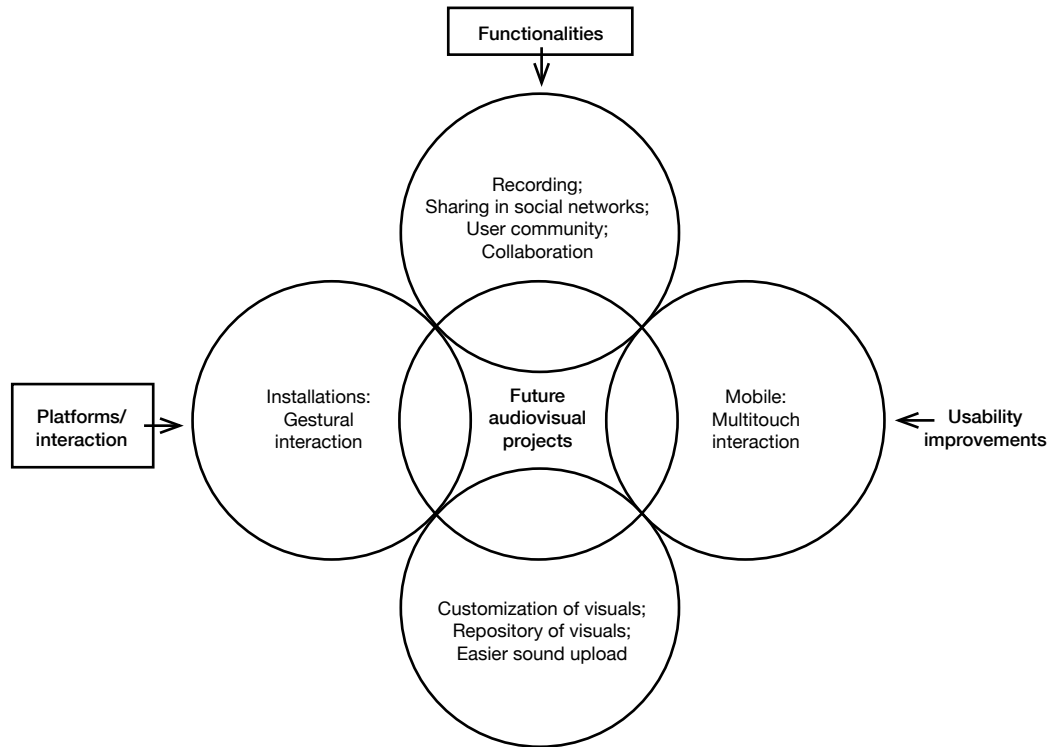
⁴⁸ http://www.youtube.com/watch?v=rV_Mnyyi6wk

website) could be created to showcase user-generated content made with Video Jack projects. This forum could evolve into an online community of audiovisual art enthusiasts, allowing for sharing their creations, content, interests and activities, while facilitating collaboration.

Developments related to customization of visuals are equally important for questionnaire respondents. In my opinion, this might be due to the lesser amount of visuals than sounds, and to the distinctive visual style of the animations in *AV Clash* (compared with the much more varied range of sounds). The customization of visuals would dilute the character and visual coherence of the project, but would increase its flexibility. As was presented in the comparison between *AV Clash* and *AVOL*, there is a trade-off between diversity and harmony, and different users will situate themselves differently regarding this. The customization of visuals could be achieved by creating an online database of vector graphics (with or without animation) that could become a visual counterpoint of Freesound.org, and by incorporating drawing tools within the project. An easier means to bring sounds into the project than the one found in *AV Clash* (tagging a sound as “avclash” in Freesound.org) could also be provided. An interesting challenge for a future project might be to combine the abstract animation style of *AV Clash* with figurative visuals in the line of *Master and Margarita*, since nearly half the respondents manifested interest in this combination.

A majority of test users consider important the future development of *AV Clash* as a larger installation, with gestural control. This becomes even more attractive following recent developments in “natural” interaction technology, such as the Microsoft Kinect depth sensor, with its relative low cost and potential for gestural control. I consider that devices with multi-touch screens, such as iOS and Android devices, are particularly attractive for interactive audiovisual projects, because of the more direct manipulation of content they offer, compared to pointing devices (such as the mouse or trackpad). Additionally, they allow for a richer and more flexible control due to recognition of multiple touch points. The dissemination of these devices, and the ease of distribution via “app stores”, adds to this attractiveness. Developments in this direction by artists such as Brian Eno and Björk (presented in section 2.4) are notable examples. Slightly more than half of the respondents consider that this would be an important development. Collaborative functionalities, considered important by approximately half of the respondents, could also be added. These functionalities could take advantage of the online nature of the projects, in order to allow for networked collaboration (Figure 32).

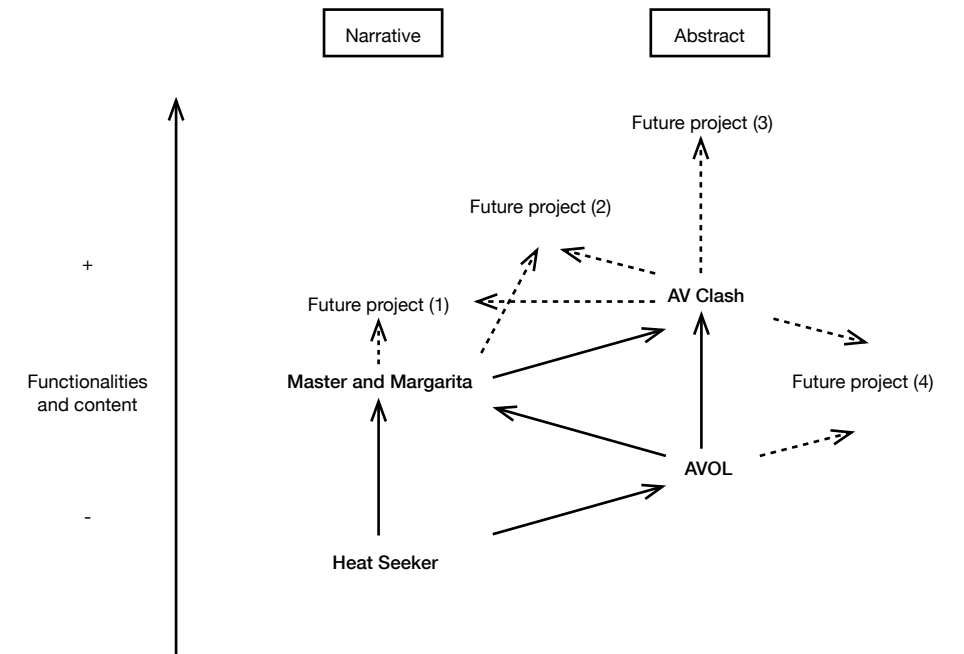
Figure 32. Most important future developments for questionnaire respondents



Adding new functionalities should take into account usability considerations. The results of the questionnaire regarding usability in *AV Clash* were not entirely positive. Respondents mentioned usability issues in different open-ended questions throughout the questionnaire, including suggestions for improvement in the future developments section. This highlights the relevance of user studies in interactive art projects, as advocated by Höök et al. (2003). Further developments in *AV Clash* should better facilitate learning and experimentation through “active exploration” (Norman 2002, p.183). One possible solution for making exploration easier is to add an introductory overview of the system, that is well integrated with the overall experience, and that is not detractive to more experienced users. Hopefully, new modalities of interaction that could be explored, such as multi-touch and gestural interaction, would lead to usability improvements.

As mentioned above, three profiles of users were identified: those who are satisfied with the balance of functionalities and variety of content of *AV Clash*; those who prefer the simpler approach of *AVOL*, with less manipulation options and more harmonious content; and those who are unsatisfied with both projects and wish more customization and manipulation options. The last two profiles point to two different paths for interactive audiovisual projects, respectively: to invest more in playfulness (for example, exploring a more game-like approach) and coherent content, or to develop further customization options and manipulation capabilities. In both cases, recording and sharing functionalities should be included, and ease of use should be pursued. Figure 33 represents a map of some of the possibilities I have identified for future developments. Future projects 1 and 2 represent different hybrids of *AV Clash* with the narrative approach, where project 1 stays closer to the narrative style of *Master and Margarita*, incorporating functionalities of *AV Clash*, and project 2 attempts to blur the lines between abstract and narrative content, bringing figurative elements to the engine behind *AV Clash*. Future project 3 represents a more linear evolution of *AV Clash* towards more functionalities and content, attempting to satisfy the needs of the “power users” identified above. Project 4 would attempt to build upon the playful simplicity of *AVOL*, eventually moving into gaming, and would add social functionalities, such as sharing.

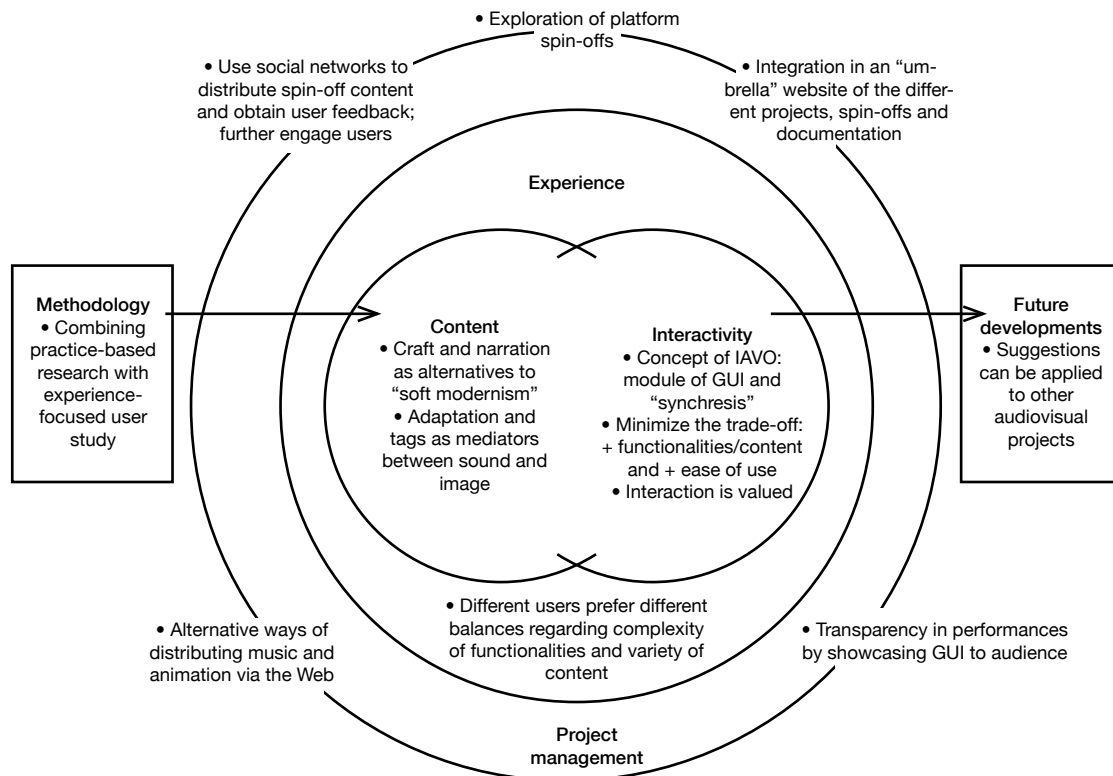
Figure 33. Paths for future projects identified in the user study



3.8 Contributions

The conclusions presented above were mostly related to the specific projects that are part of the study. However, these conclusions can be also abstracted into more generic ones, which I hope can provide useful contributions to the field of new media art, and interactive audiovisual art in particular (Figure 34).

Figure 34. Summary of the contributions of the study



These contributions include:

- The study introduces the notion of Interactive AudioVisual Objects (IAVOs) as a modular approach to visual music projects, where each sound loop is combined with a matching animation visualizing that sound, incorporating GUI elements to control both audio and visuals. Those GUI elements are embedded in the visuals, and aesthetically integrated with the animation style and with the overall visual character of the project, contributing to a coherent experience. Synchronization between audio and visuals is maintained via an algorithm that analyses sound and manipulates the respective animation based on that analysis.
- The study proposes the extension of some of Michel Chion's concepts from linear media into the realm of interactive audiovisuals, such as Chion's "audiovisual contract" into an "interactive audiovisual contract" - a symbolic contract that the users enter into, agreeing to consider that sound, visualization and GUI form a single entity (in the case of Video Jack projects, this entity is the IAVO).
- The study suggests that users prefer to interact more intensively with audiovisual projects instead of using automated mechanisms, as advocated by Eno for example (1996, p.309), or instead of watching linear media versions of the project (videos or soundtracks).
- Regarding content, the study provides insights regarding the use of abstract and figurative visual content together with sound, and use of different approaches to sound (either more harmonious and curated or more chaotic and diverse), and suggests that all can be valid approaches, depending on its audience. The use of figurative elements, and hand-crafted elements combined with algorithmically generated visuals, allows for a diversification from the dominant "soft modernism" tendency identified by Manovich in new media art (2002a, pp.13-16).
- With one of its projects (*Master and Margarita*), the study proposes an adaptation approach for audiovisual projects - the original work as mediator between music and graphics. This approach based on the spirit of the original material (not fully on its letter) to ensure a mutual agreement

between the two. To a lesser degree, the tags in *AV Clash* also have a similar role of mediators between audio and visuals. The effective use of such mediators adds a triangulation perspective to the visualization of sound.

- The study highlights that care should be taken to minimize the trade-off effect between, on the one hand, adding functionalities and content; and on the other hand, improving ease of use and explorability.
- *AVOL* and *AV Clash* represent case studies of a trade-off in similar projects between: a reduced amount of manipulation options with harmonious and synchronized content, in the former; and a higher amount of manipulation options and diversity of content, in the latter. Users position themselves differently in preference regarding the two.
- Based on this positioning, a tentative segmentation of users of interactive audiovisual projects into three groups is proposed: those who are more satisfied with a simpler approach (as in *AVOL*); the ones who prefer a more diverse approach, with more content and manipulation options (as in *AV Clash*); and the ones who aim towards more customization of content and manipulation capabilities (the needs of this segment should be addressed by a future project).
- Although the study is focused on the net art projects, it also suggests different paths for developing cross-platform audiovisual projects, involving performance, video, exhibitions and web.
- In terms of performances, Video Jack projects propose showcasing the GUI together with the visuals, aiming to convey to the audience the actions of the performers, contributing to a feeling of real-time authenticity.
- The web projects also point out alternative ways of music distribution and promotion, both by integrating remixable music modules and by linking to (linear) soundtrack spin-offs.
- The study proposes an “umbrella” website to host the web projects and connect these to their spin-offs, social networks and documentation material.
- The study also stresses the importance of social networks for promoting the projects, distributing related spin-off media,

obtaining feedback from users, and establishing a dialog with these users, contributing to a further engagement with the projects.

- In terms of methodology, it provides an example of evaluation in new media arts, with an experience-focused approach to HCI, within a practice-based research methodology.
- Finally, the study proposes paths for future developments in interactive audiovisual projects, based mainly on the suggestions of users, but also on his views, with a focus on: recording videos or audio files of interaction sessions with the projects; sharing those recordings through social networks; and using other modes of interaction such as gesture and multi-touch.

I believe that there is a large potential for projects combining visuals, music and interactivity, where “composer, performer and audience converge in the playing subject” – the user (Stockburger 2009, p.122). It is a largely unexplored territory, which is becoming constantly wider with developments such as: the adoption of novel models for authorship; emergence of new business paradigms for content distribution; new web standards; increases in Internet bandwidth; widespread use of powerful mobile technology; and more advanced and intuitive interaction capabilities in mainstream devices. Simultaneously, old models of music and audiovisual distribution are becoming more exhausted and narrow. With the present study, I hope to have mapped a fragment of this territory, and pointed the way to new paths.

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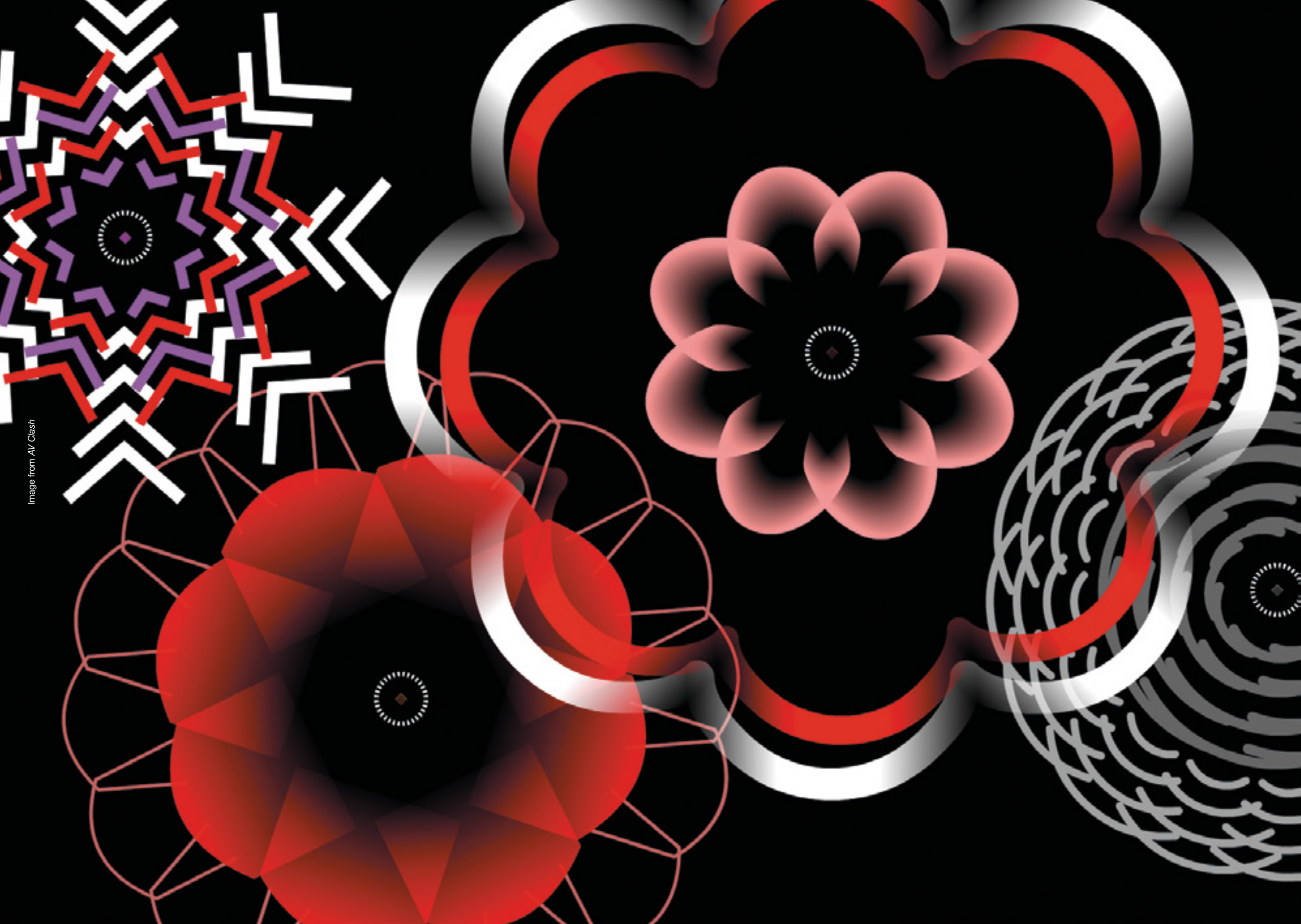


Image from AV Clash

5 Article 1:

Heat Seeker – an Interactive Audio-Visual Project for Performance, Video and Web

Keywords

Music visualization
 audiovisual tool
 audiovisual performance
 new media art
 net art
 interaction design

Abstract

Heat Seeker is an audio-visual project, which has been released in different formats: performance, video, and website. In this paper, it is contextualized with similar projects that combine music and visuals. The motivation and aims behind *Heat Seeker* are then presented. The main objective is to combine visuals with sound in an electronic music performance, creating an engaging hypermediated experience for the audience. A description of the project and its development follows, including project extensions to different platforms, such as the Web. Conclusions are reached regarding the accomplishment of the initial aims, which are only partially achieved, particularly in the areas of flexibility of the project and coherence of content. Paths for future developments are then outlined, in terms of additional project extensions and additional projects.

1. Introduction

Heat Seeker is an audio-visual project by Video Jack (a collective composed of the author and André Carrilho), developed between 2003 and 2009. It

was showcased as audio-visual performance between 2004 and 2008 – initially in Portugal, and later in festivals in Poland, Germany and Russia. A CD/DVD based on the project was released in 2006. In the following two years, the *Heat Seeker* DVD was screened in festivals in the UK, Brazil, China and France. A web version was released in 2009, allowing users to interact with the visuals, creating their own “music videos” to the tracks from *Heat Seeker*.

Next, *Heat Seeker* will be contextualized with similar works, followed by a description of the project and its development.

2. Contextualization

The *Heat Seeker* project is related to similar projects combining sound and visuals. This audio-visual juxtaposition has a long tradition in history.

The relation between music and image has been studied throughout the centuries. Already in ancient Greece, philosophers considered that there was a correlation between the musical scale and the rainbow spectrum of hues (Moritz 1997).

In the 17th century, Isaac Newton

tried to connect sound oscillations to their correspondent light waves. Several artists have tried to create a “total art work” fusing different art forms together, such as Richard Wagner with his concept of “*gesamtkunstwerk*” (Wagner 1849). Explorations in the first half of the 20th century, notably within creative movements such as Bauhaus and Futurism, took the concept of “synthesis of the arts” further. In the 1920s, Oskar Fischinger and Walther Ruttmann created “visual music” films in Germany – a combination of tinted animation with live music (Moritz 1997). Fischinger was an inspiration to a younger generation of visual music artists that emerged in the mid 20th century, such as brothers John and James Whitney (Moritz 1995).

The development of electronic technologies inspired other authors to explore new ways of synthesis of the arts. Ascott named this new convergence “*gesamtdatenwerk*”, updating Wagner’s concept (Ascott 1990, p. 307). Many of these projects explore an integrated audio and visual expression. These projects often “stand in the tradition of kinetic light performance or the visual music of the German abstractor and painter Oskar Fischinger” (Paul 2003, p. 134). Artists such as Golan Levin (often in collaboration with Zachary Lieberman) have explored interconnected audio-visual creative expression, in works such as *Audiovisual Environment Suite* (1998-2000). Some of these artists create audio-visual instruments and “sound games”. In 1999, John Klima created *Glasbead*, an “online art work that enables up to 20 simultaneous participants to make music collaboratively via a colorful three-dimensional interface” (Tribe and Jana 2007, p. 54). In 2005, Toshio Iwai’s *Electroplankton* was released for Nintendo DS, a group of ten different interactive audio-visual games themed around cartoon plankton, building upon past artistic work by Iwai. Also in 2005, Sergi Jordà and his team at Universitat Pompeu Fabra created *Reactable*, a multi-user electro-acoustic music instrument with a tabletop tan-

gible user interface. *Reactable* has dynamic visual-feedback capabilities: “a projector (...) draws dynamic animations on its surface, providing a visual feedback of the state, the activity and the main characteristics of the sounds produced by the audio synthesizer” (Kaltenbrunner et al 2006, p. 1).

Heat Seeker has similarities with pre-digital works such as Oskar Fischinger’s visual music works, and also with recent digital playful audio-visual projects such as *Electroplankton*.

3. Methodology, Motivation and Aims

Heat Seeker came about from discussions about electronic music, VJing and audio-visual performance between the author (a musician and programmer) and André Carrilho (an animator and illustrator). The author was dissatisfied with the visual element of his electronic music performances, and was interested in using projected motion graphics as a performance complement. André Carrilho was also interested in VJing and in combining his animation work with music. Both shared a mutual interest in electronic music, illustration and clubbing culture. They decided to develop work together under the name Video Jack.

The research presented in this paper was conducted by the author, as developer and user of *Heat Seeker*, by means of a practice-based methodology. It is therefore part of an “investigation undertaken in order to gain new knowledge partly by means of practice and the outcomes of that practice” (Candy 2006, p. 1).

3.1 Combining of Music and Visuals

The main question *Heat Seeker* addresses is: how to combine visuals with sound in an electronic music performance (restoring a visual element that is lacking in laptop-based music performances), creating an engaging hypermediated experience for the audience? Video Jack also aim to explore other channels to present the project,

beyond performances.

Both images and sound embody movement, as Nicholas Cook states. Consequentially any alignment of music and moving image that “reaches a threshold of similarity between the two” can create a “transference of kinesthetic qualities” between one and the other. Cook calls this a “kind of ventriloquism” (1998, p. 78).

The combination of image and sound, asserts Cook, “contextualizes, clarifies, and in a sense analyzes the music”, activating “a new, or at any rate a deepened, experience of the music” (1998, p. 74). *Heat Seeker* aimed to reach this “new and deepened” experience.

According to Nicholas Cook, media such as “music, texts, and moving pictures do not just communicate meaning, but participate actively in its construction” (1998, p. 261). Music has not only meaning but also potential for meaning, which is fulfilled in relation with the context in which it is received. Meaning resides “not in musical sound, then, nor in the media with which it is aligned, but in the encounter between them” (Cook 1998, p. 270). Having created the visuals and music of *Heat Seeker* in articulation with each other, Video Jack hoped to provide the elements for the construction of a coherent audio-visual meaning.

3.2 Achieving Flexibility and Expression

Another objective of the project is to create a tool for manipulating visuals that has a similar flexibility as a music instrument, and that could allow for the same kind of improvisation and expression. Automated audio reactivity was not a priority in the development of *Heat Seeker* – Video Jack were interested in exploring the uncertainty of human reactions. This would ideally lead to a greater variety of results.

Sergi Jordà, as constructor of musical instruments, aims for “instruments that are enjoyable to play and that mutually enhance the experience when playing with other musicians”,

and “that will surprise (...) as much as possible, that will keep revealing little hidden secrets at every new listening” (Jordà 2005, p. 4).

With *Heat Seeker*, Video Jack aimed for the same degree of flexibility, surprise and variation of result in its visual side, enhancing the musical side, with which it establishes a dialogue.

3.3 Displaying the Act of Content Manipulation

An additional aim of *Heat Seeker* was to make the act of manipulating the visuals apparent to the audience, similarly to how the audience views a musical instrument being played live in a performance (an additional parallel to musical instruments). The combination of the visual content with the visualization of content manipulation, in articulation with the music, should ideally result in an engaging experience for the audience.

According to Austerlitz, the enjoyment of music has always been linked with the experience of “watching a performer physically produce musical sound”. The performer’s body language has been a fundamental aspect of the music experience. The rise of radio and mechanical reproduction of media in the 20th century changed this scenario. Music became a “commodity”, possible to be “disembodied” from the performers (Austerlitz 2007, p. 11). Parallel with these technological advancements, efforts were made to “reunite the separated segments of the musical experience”, merging sound and image, and creating a new art form, to realize “Wagner’s dream of *gesamtkunstwerk*” (Austerlitz 2007, pp. 11-12).

This “reunification of segments of the musical experience” was thus one of the objectives of *Heat Seeker*. In laptop-based electronic music performances, the visual impact of physical musical manipulation is usually limited. The performer typically employs a limited range of subtle gestures, using a mouse (or track pad) and keyboard, occasionally complemented with small hardware controllers. The impact of

these gestures is difficult to discern by the audience. *Heat Seeker* aimed to reunite sound with the visual element of performance, by displaying to the audience the construction and manipulation of visual content, in reaction to the music. In other words, *Heat Seeker* aimed to match the transparency of live music performance with nonelectronic instruments.

Therefore, *Heat Seeker* shares resemblance with works such as Emergency Broadcast Network’s *Telecommunications Breakdown*, as described by Bolter and Grusin: “the Emergency Broadcast Network’s CD-ROM conveys the feeling that we are witnessing, and in a way participating in, the process of its own construction (...) by emphasizing process” (Bolter and Grusin 2000, p. 54).

3.4 Exploring Additional Project Spin-Offs

Video Jack aimed to explore additional project extensions, additionally to performances. Other project extensions explored were a video “spin-off” (“music videos” of each track distributed by DVD, online, and in festival screenings) and an interactive online version. This way, *Heat Seeker* could obtain a larger exposure, reach different audiences, and also satisfy different preferences of their audiences in their roles regarding the project. These roles could be varied: witnesses to real-time interaction, in the case of performance; viewers of a linear “music video” version; or users themselves, by accessing the interactive web version.

4. Development and Description

The development of *Heat Seeker* involved two different stages: software development and content development (music and animations). These two stages will be presented next, together with a description of the software. The animated content of *Heat Seeker* is also contextualized with other works.

4.1 Software Development

Due to the author’s background in programming (particularly Adobe Flash and ActionScript), developing a custom tool for audio-visual performance had the potential to allow for a more personal and flexible approach. Discussions in 2003 led to the development of an application for controlling digital animation to use along with music performances, which would allow for the control of different types of animated modules that could be combined to create, in real time, a unique visual experience for each event.

4.2 Description of the Tool

The *Heat Seeker* software was created originally for performances. It was meant to be used as a visual content management and manipulation system for performers, and also to be projected to the audience. The graphical interface of *Heat Seeker* is mainly situated in the edges of the screen, in order to be discreet and to emphasize the animated content in the central area. The interface is visible to the audience, and is part of the visual experience, in order for the audience to see how the visuals are being manipulated in real time. Buttons distributed in the edges of the screen, organized in a 9-by-9 grid, activate and deactivate four different types of animations. The cursor is present on the screen, revealing the editing choices. Therefore, almost all types of visual manipulation are apparent to the viewer (with the exception of a few functionalities which rely on keyboard presses).

One of the animation types is particularly flexible – small animations named “animated icons”, which can be resized and positioned on a 9-by-9 grid, using drag-and-drop or a randomize function (Figure 1.).

The four types of animation can overlap and coexist on the screen, creating multi-layered visuals. The effect of triggering and manipulating animations, in conjunction and in relation with the music, is similar to directing a



Figure 1. Full screen animation overlapped with animated icons

music video in real-time. It also bears resemblance to playing a computer game or manipulating a graphical user interface operating system.

Heat Seeker's use of graphical user interface – shown to the audience as part of the visuals – contributes to the transparency of the project. The actions of the performers, represented by the cursor, are always visible. As Bolter and Grusin state: “the triumph of immediacy (...) is apparent in the triumph of the graphical user interface (GUI) for personal computers” (2000, p. 23). By showing the cursor and the interface in the performance, Video Jack share this immediacy of manipulation with the audience: “the mouse and the pen-based interface allow the user the immediacy of touching, dragging, and manipulating visually attractive interfaces” (Bolter and Grusin 2000, p. 23).

In *Heat Seeker*, Video Jack combine hypermediacy (music and visuals combined, and in articulation) with transparency (the interface showcasing the interaction taking place), in order for the audience to achieve an engaging experience, that also “feels” genuine and being constructed in real time. The combination of hypermedia with transparency aims to immerse the audience in the work. As Bolter and Grusin clarify, “hypermedia and transparent media are opposite manifestations of the same desire: the desire to get past the limits of representation and to achieve the real” (Bolter and Grusin 2000, p. 53).

Computer games, interaction design and new media art were main influences for designing the software used in *Heat Seeker*.

4.3 Content Development

Once the software tool was ready, Video Jack started preparing the audio-visual material for their first *Heat Seeker* performance. The author had already composed part of the music. The preparation of visual content to be used with the software involved a discussion regarding the themes and inspiration behind the music. Animation, cinema and comics were major influences for the project. The movie genres “film noir” and “nouvelle vague” were particularly emphasized, as were concepts related to “heat”. André Carrilho developed animations for use in *Heat Seeker* based on that discussion, and his own interpretation of the music. He produced additional animations, which in turn served as inspiration for more music by the author. The animations were then inserted into the software application. The grouping of this audio-visual content with the software tool became the *Heat Seeker* project.

In their analysis of video game *The Last Express*, Bolter and Grusin state: “although the characters and backgrounds are graphic stills and animations (...), the mise-en scène and the ‘camera shots’ are entirely consistent with the Hollywood style. The player clearly feels herself to be in a film – as usual, a film of mystery or deception” (2000, p. 98). *Heat Seeker*, in a similar fashion to *The Last Express* as described by Bolter and Grusin, also uses a cinematic language in its animations.

A significant part of the animation material has a narrative side – characters, places and objects can be recognized into situations and stories. Although there are no linear narratives per se, it is intended to provide enough narrative “suggestions” for the members of the audience to create their own interpretation. This is similar

to music video narratives. Most music videos “do not embody complete narratives or convey finely wrought stories”; otherwise “the song would recede into the background, like film music” (Vernallis 2004, pp. 3-4). Music videos benefit from withholding information, “confronting the viewer with ambiguous or unclear depictions” (Vernallis 2004, p. 4). The viewer becomes a participant in the music videos, as it is up to him/her to determine the ultimate meaning (Vernallis 2004, p. 10). The meaning of a music video is a “puzzle” for the viewer to solve – “stories are suggested but not given in full” (Vernallis 2004, p. 37). In *Heat Seeker*, the animated material is not related to each other between musical tracks. However, some of the characters reappear in other tracks. Furthermore, the style of the animation is also homogeneous. The objective was to create a cohesive whole, where the viewers can “connect the dots” in their own way, and interpret the different chapters as a part of a larger narrative (even if that connection is somewhat loose).

In *Heat Seeker*, Video Jack deliberately explored the use of narrative and figurative elements. They aimed to find alternatives to the geometric and abstract aesthetics, which was mainly used in similar audio-visual projects. Software art, as Manovich describes it, has mainly been concerned with abstract graphics – “soft modernism”, as he names this tendency (2002, p. 14). This “soft modernism” is not determined by nostalgic factors or hardware constraints – it is a consequence of generating graphics using more or less complex algorithms. But Manovich proposes other possibilities that expand the graphic vocabulary, beyond “a script that draws a few lines that keep moving in response to user input”, and towards figurative and fictional graphics, without necessarily following the formulas of commercial media (2002, p.16). While this might seem costly and complex, Manovich suggests resource-effective solutions such as using characters that are not

photorealistic, a fictional universe that is not exclusively 3D and a mixture of stick figures with video footage. Video Jack took the approach suggested by Manovich as alternative to “soft modernism” – resource effective narrative animation, based on animation loops. The loop is the basic building block of an electronic sound track, but it has also achieved “surprisingly strong position in contemporary visual culture”, according to Manovich (2002, p. 2). Until a user intervenes to stop the loop, “Flash animations, QuickTime movies, the characters in computer games loop endlessly” (Manovich 2002, p. 2). The visual content of *Heat Seeker* consists of short animation loops.

Music videos and cinema – and a reaction to “soft modernism” – influenced *Heat Seeker* visual content.

5. Project Spin-Offs

Ever since *Heat Seeker* was adapted from a performance project to DVD, Video Jack have been exploring the notion of project extensions or “spin-offs”. That implies taking advantage of software and content developed for a project in a certain platform, and adapting it to another one. Hence, *Heat Seeker* was adapted from a performance project to a DVD / YouTube project, and later to an interactive web project.

These “spin-offs” can be seen as “extensions” of an initial combination of software with audio-visual content. As the original project has affinities to and borrows from fields such as web sites, new media installation art, music videos and VJing, it is natural that it “extends” into those fields.

5.1 Performances

The first *Heat Seeker* performance took place in Portugal on February 2004. Since then, *Heat Seeker* was presented as audio-visual performance in different venues in Portugal, and internationally (Poland, Germany and Russia) in 2007 and 2008.

In these performances, the au-

thor would play music using a laptop, equipped with a hardware controller, and running a music sequencer (Ableton Live), while André Carrilho would manipulate *Heat Seeker* visuals. Therefore, each performance would consist of a different composition of music and visuals. Both the audio and the video manipulation were flexible and versatile, since both the music sequencer and *Heat Seeker* allow for improvisation and variation. The visuals were triggered and manipulated by André Carrilho, in reaction to the music being played by the author, and according to his own interpretation.

5.2 DVD, YouTube, Videos and Screenings

In 2006, Video Jack released in Portugal a *Heat Seeker* CD/DVD. It received positive reviews from the Portuguese press (<http://www.videojackstudios.com/press/heat-seeker-cddvd-press/>). The DVD included 11 music videos. 10 of these videos were composed of screen captures of *Heat Seeker* visuals, manipulated in real-time by André Carrilho in reaction to the pre-recorded *Heat Seeker* music – one video per music track. Although several takes were done of each video (until a satisfactory take was achieved), all the videos are unedited screen captures from one take, and all were recorded within the same session (in one afternoon). As in the performances, the user interface and cursor are shown, allowing the viewers to follow the editing decisions of the “director”.

The *Heat Seeker* DVD has been screened in festivals in the UK, Brazil, China and France. The videos released on DVD were later uploaded to Internet video sites YouTube (<http://www.youtube.com/videojackstudios>) and Vimeo (<http://www.vimeo.com/videojackstudios>). The Internet has become a major distribution channel for music videos. Sites such as YouTube and MySpace have, according to Austerlitz, “grown into Internet titans by virtue of their music video holdings” (2007, p. 221). The music video has gone “from

being centralized in the programming of two or three cable channels to being diffused all over the Internet” (Austerlitz 2007, p. 221). Fans easily circulate music videos – “dispersed to the four winds of the Internet” (Austerlitz 2007, p. 221). As Austerlitz concludes, “music videos have been reborn, reanimated for the era of the Internet” (2007, p. 221).

5.3 Web

After publishing the *Heat Seeker* DVD and the performance tour, Video Jack decided to release *Heat Seeker* as an interactive online project. This decision was accentuated by the experience gathered from the following Video Jack project, *AVOL* (2007), which was developed from the start as a web project. As *Heat Seeker* was built using Adobe Flash, which is also a web development platform, it could be functional online with some adaptations. *Heat Seeker* was released online in 2009 (<http://www.videojackstudios.com/heatseeker/>).

In *Heat Seeker* online, the distinction between user and audience becomes blurred – the user is also the audience to his/her own interactions with the software and audio-visual material.

One of the major constraints for adapting the project to the web was its file size. The *Heat Seeker* visual content and software were originally integrated into one single file, which would be too large for an adequate loading time, even over a broadband connection. The solution was to divide the project into 10 different files, one per track. A menu was created to allow for the choice of tracks. A pre-loader was also included in each file, in order to give an indication of the loading time. In *Heat Seeker* online, each music track starts once the respective file is loaded, and plays continuously. It is not possible to manipulate the music – it is only possible to manipulate the visual side of the online project.

The user interface also needed to be adapted for the web. Some of the

functionalities in the performance version of *Heat Seeker* involved the keyboard. The author and André Carrilho discussed how to incorporate these functionalities in the web version, and concluded that keyboard functionalities should be eliminated, as they are not visible to the user and therefore hard to discover. Video Jack intended that the interface would be very simple, with no need for instructions, and that discovery would be part of the experience. Some of the former keyboard functionalities were adapted to the graphical user interface, such as changing background colors (a new menu was created in the top edge) and animation randomization options. Other functionalities were removed altogether, such as the opacity controls.

In terms of interaction design, Video Jack aimed to achieve a very simple, yet flexible interface – not only for themselves as users, but also for the possible users of the web version of *Heat Seeker*. The functionalities should be obvious, without need for instructions – “the device must explain itself” as Donald Norman asserts (2002, p. xi). The interface should rely as much as possible in visible elements, which are part of the GUI.

Discovery is an important element of *Heat Seeker* online. Users are confronted with a minimal interface, and no instructions. However, the logic of the application should be apparent after the first few interactions. This was achieved by ensuring that all visual interface elements have visual feedback – “without feedback, one is always wondering whether anything has happened” (Norman 2002, p. xii).

In *Heat Seeker*, only the relevant GUI elements are present at a given time, thus applying the principle that “a good designer makes sure that appropriate actions are perceptible and inappropriate ones invisible” (Norman 2002, p. xii). The background color buttons are an example of this principle – they are only visible if there are no full screen animations, otherwise the effect of changing color would not be apparent.

6. Conclusions

As both developer and user of *Heat Seeker*, the author reached several conclusions regarding how the project has managed to reach its objectives. Feedback from the other project developer, André Carrilho, was taken into account.

6.1 Performances

In terms of performance, the author considers that the aims of conveying a hypermediated experience with a coherent audio-visual universe; flexibility of expression; and of transparency of content operation were partially achieved, although there is room for improvement in these aspects.

One of the limitations that the author found was that the sonic side of the project was separated from the interactive visual side, in terms of their software and manipulation capabilities. That prevented the development of audio-reactive visuals, based on a software analysis of sound, and not only on personal interpretation. The integration of sound manipulation with the visuals and GUI would also make the sound manipulation more apparent to the viewers.

Optimizing stage layout was a concern that surfaced in the first few performances. Due to technical constraints, two of the first presentations of *Heat Seeker* took place in venues where the projection was situated perpendicularly to the performers. From the performers’ perspective, this stage layout created a separation between the projected image and the real-time interaction of the performers. Therefore, those performances lacked transparency, in the performers’ opinion. The audience, faced with the effort of having to switch attention between two views, focused mainly on the screen instead of the performers. Thus, the experience lost some of its “live” nature, resembling a pre-recorded session. In an effort to avoid this, Video Jack decided, from then on, to place the screen behind (and

slightly above) them, so that performers, their equipment and the projection are placed within the same focal point, and are not competing for the audience's attention.

Further explorations could be also be undertaken to better integrate the actions of the performers with the visuals, and to further showcase their interactions on stage, thus adding to the intended transparency of the performance. The author feels that the gestures of the performers are still too hidden

6.2 DVD, Videos and Screenings

The videos, which present *Heat Seeker* without its interactive component, fulfill the objective of showcasing the project in different formats, with different degrees of interactivity. The video format is very portable and easily distributed on the web, allowing a larger audience to access the content. It also allows for presentation of the project in festivals without the need of Video Jack being physically present.

In the author's opinion, the image quality of the videos on the *Heat Seeker* DVD (and in YouTube / Vimeo) is not ideal, because of the inadequate quality of the video equipment used. This was one of the motivations behind the release of an online interactive version of the project. The author felt that a web presentation of the project (using the original animation modules) could showcase the visuals in a higher level of quality and detail.

6.3 Web

The web extension of *Heat Seeker* realizes the aim of allowing the audience to become users, by interacting with the project.

The author concludes that some of the functionalities that were removed should have been implemented in the GUI (such as the opacity controls). That would allow for more diversity of manipulation by users. It is also his belief that some sound controls should have been added (at least basic con-

trols such as volume and on/off button). The aesthetics of the new user interface elements (buttons in the corners of the screen) could be improved. A passive, non interactive, "hands off" version could be created. It could output generative motion graphics out of automated random selections of visuals, eventually with audio level analysis as an additional control parameter. This alternative version could work as a "demonstration" for the functionalities of the system, and also as an alternative way to experience the content – based not on choice and interaction but on randomness.

Ideally there should additionally exist a possibility for users to record their interactions with the system, and save that session as a separate file that could be viewed or shared online.

6.4 Content

The author considers that the audio-visual content has the desired integrated impact, contributing to a new meaning resulting from the encounter between music and visuals.

However, another problem detected by the author in the *Heat Seeker* project is that the visual and music content is not homogenous enough. In visual terms, that problem lies both in the storylines and the visual styles of the animations, which are too diverse. In sonic terms, it lies in the diversity of sound palette and musical styles. The author considers that there should have been more coherence among the different animations, and also between different songs. This would help to achieve a deeper narrative effect on the viewers – to allow them to connect the different segments into one piece. The excessive stylistic diversity is due to the long development period of the project and the absence of stricter guidelines from its start.

7. Further Developments

Future additional extensions of *Heat Seeker*, and other future Video Jack projects, could explore further the ini-

tial aims of the project. These future works could also answer new questions that the development of *Heat Seeker* has posed.

7.1 Additional Spin-Offs

Further spin-offs of *Heat Seeker* could be created, beyond performances, DVD and the web. The project could easily be converted for portable devices, such as smart phones, provided that the user interface would be adapted to a smaller screen size and touch screen interactions. It could also be adapted to other devices, such as game consoles.

7.2 Future Projects

The author has made the attempt to answer some of the questions raised by *Heat Seeker* by developing new Video Jack projects, namely *AVOL* (2007, <http://www.videojackstudios.com/avol/>) and *Master and Margarita* (2009, <http://www.videojackstudios.com/masterandmargarita/>).

While *AVOL* deals with abstract animation, *Master and Margarita* (an audio-visual adaptation of the novel of the same name by Mikhail Bulgakov) has a similar narrative approach as *Heat Seeker*. These projects try to address issues of developing automatic audio reactivity for animations (particularly *AVOL*); increased music manipulation capabilities; higher video quality for DVD and online video distribution; and increased homogeneity of music and visual content (particularly *Master and Margarita*).

However, there are still aims to be fulfilled regarding *Heat Seeker*, and additional ones from the two newer projects. Among those concerns are: added integration of performers with the visuals, and sharing of online content among users. In order to give answer to those concerns, further projects will need to be developed.

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6 Article 2:

AVOL: Towards an Integrated Audio-Visual Expression

Keywords

interactive art
audio-visual art
net art
installation
performance
interaction design

Abstract

Audio-Visual OnLine (AVOL) is an interactive audio-visual project for the Web, installation and performance by Video Jack (a duo composed of the author and André Carrilho). AVOL was one of the four winners of a competition by the Portuguese Ministry of Culture to develop artworks for their net art portal. Further to the launch of this portal, AVOL has been presented as installation and as performance. In AVOL, users manipulate seven 'objects' composed of different elements: a sound loop, an animated visualization of that sound, and graphical user interface elements that facilitate the integrated manipulation of sound and image. Each of the objects has four main variations, allowing for multiple audio-visual combinations. The objects may interact with each other, creating additional diversity. The main research question that the project addresses is: how to develop a project that allows for an integrated musical and visual expression, in a way that is playful to use and engaging to experience. The methodology used for the evaluation of the project is practice-based research. In this article, the project and its moti-

ations are presented, as well as prior work from the same authors in the field of interactive audio-visual art. A short discussion of the state of the art follows. The development of the project and the different modes of presentation (Web, installation and performance) are discussed, as well as feedback gathered. Conclusions are then reached, and possible future developments are outlined.

1. Background

1.1 Call for proposals by Direcção Geral das Artes

In January 2007, Video Jack were among the twelve Portuguese artists invited by Direcção Geral das Artes (DGA; a department of the Portuguese Ministry of Culture) 'to submit a proposal to develop an art work conceived specifically for the Internet, for the purpose of integrating the future Net.Art Gallery' (translated from the original invitation letter by DGA). Video Jack are a duo composed of the author, a programmer and musician, and André Carrilho, an illustrator and designer. Video Jack were one of the four artists chosen for the Gallery, with a

proposal entitled *Audio-Visual OnLine (AVOL, Figure 1)*. DGA's Net.Art Gallery was released in December 2007 (<http://netarte.dgartes.pt/>).

1.2 Previous related work

In 2006, Video Jack had finished their first major project, entitled *Heat Seeker* (<http://www.videojackstudios.com/projects/heat-seeker/>). The main objective of *Heat Seeker* was to combine animated visuals with sound in an electronic music performance, restoring a visual element that is lacking in laptop-based music performances and creating an engaging hypermediated experience for the audience. An additional aim of *Heat Seeker* was to

commercial software (specifically, Ableton Live). Another distinctive aspect of *Heat Seeker* was its use of narrative animation, combined with non-narrative elements. Among the latter were 'animated icons', particularly flexible small animations that could be manipulated by drag-and-drop, key presses or random behaviours.

Another previous work by Video Jack, *Idiot Prince* (<http://www.videojackstudios.com/projects/idiot-prince/>), also from 2006, was influential for *AVOL*.

In *Idiot Prince*, abstract animation modules possess generative behaviours, such as random movement, creating overlapping patterns. The starting point for *Idiot Prince* were the

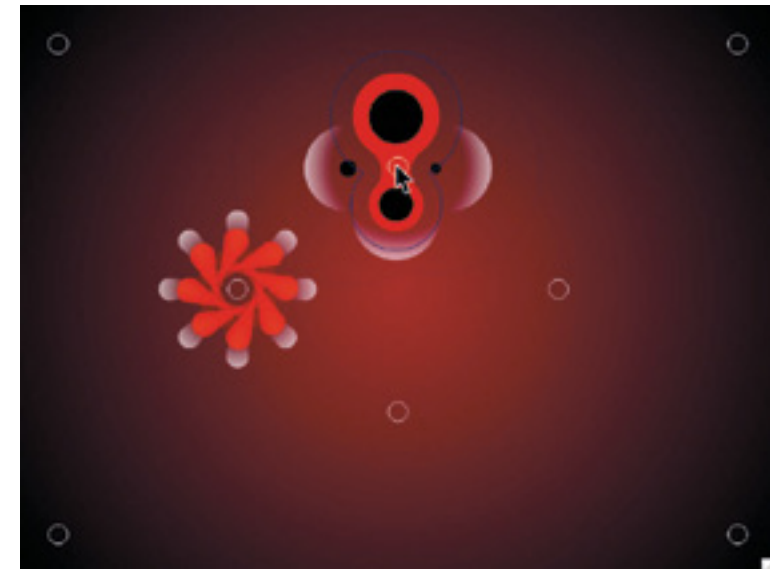


Figure 1: AVOL sketch submitted in original proposal.

make the act of manipulating the visuals apparent to the audience, similarly to how the audience views a traditional musical instrument being played live in a performance.

In *Heat Seeker* performances, the sound element was manipulated separately from the visual component – the software built by Video Jack allowed for visual manipulation, whereas the audio element was manipulated using

'animated icons' developed for *Heat Seeker*, although in *Idiot Prince* their behaviour had lost the interactive aspect, depending exclusively on random behaviours.

For the audio side of *AVOL*, the author drew inspiration from *Role-Playing Egas* (<http://www.videojackstudios.com/collab/egas/>), a project about Egas Moniz, Portuguese winner of the Nobel Prize in Medicine. *Role-Playing Egas* was developed by the author and Portuguese artist and researcher Patrícia Gouveia. The project includes

a ‘music box’ section, with eight audio loops of equal length. There are start and stop buttons for each loop. Having the same length, they are interchangeable, allowing for the creation of multiple combinations of sounds.

For their next project, Video Jack aimed to integrate the two elements that were separate in *Heat Seeker* – audio and image – under the same application and the same interface.

2. Motivations and aims

The call for proposals from DGA provided the trigger to develop a follow-up to *Heat Seeker*, which would be showcased on the Web instead of in performances. This provided an additional challenge – to develop an application that would be used not by Video Jack, but potentially by anyone with Internet access. With *AVOL*, Video Jack aimed to pursue their objective to integrate image and sound in the same software environment. Their main concern was to develop a project that would allow for an integrated musical and visual expression, in a way that would be playful to use and engaging to experience.

For *AVOL*, the author planned to develop the ‘animated icons’ in *Heat Seeker* into animated elements that would not only be audio-reactive, but also control sound. As in the ‘animated icons’, they would have drag-and-drop functionalities and randomization possibilities. These elements were entitled ‘Interactive Audio-Visual Objects’ (IA-VOs), because they would combine an interactive element – a graphical user interface (GUI) to control sound – with sound visualization, by means of audio-reactive animations.

Using *AVOL*, the user should be able to combine different sound loops, and consequentially different animation loops, creating an audio-visual composition.

The name was inspired by Sergi Jordà’s work *Faust Music OnLine (FMOL)*, ‘an Internet project for real-time collective composition’ (1999: 1).

3. State of the art

3.1 Early explorations in music and image

The relation between music and image has been explored throughout the centuries. Ancient Greek philosophers, such as Aristotle and Pythagoras, considered that there was a correlation between the musical scale and the rainbow spectrum of hues (Moritz 1997). The colour to music correlation was further explored in the Renaissance by several artists, including Leonardo da Vinci, and later by Isaac Newton (Van Campen 2008: 45–46).

Artistic movements of the early twentieth century, such as Bauhaus and the Futurists, further explored combinations of music and image. Italian Futurists Arnaldo Ginna and Bruno Corra experimented with ‘colour organ’ projection in 1909 and painted ‘some nine abstract films directly on film-stock in 1911’ (Moritz 1997). In the 1920s, Oskar Fischinger and Walther Ruttmann created visual music films in Germany – a combination of tinted animation with live music (Moritz 1997).

When Oskar Fischinger moved to Hollywood in 1936, he became an inspiration to a younger generation of visual music artists, such as brothers John and James Whitney, who ‘decided to take up abstract animation after seeing a screening of Oskar’s film at the Stendhal art gallery in 1939’ (Moritz 1995). John Whitney is ‘widely considered “the father of computer graphics”’ for his explorations of computer-generated manipulation of visuals through mathematical functions (Paul 2003: 15). He was among the first generation to use computers for the creation of artworks in the 1960s. Whitney’s work is influenced by music – ‘I am moved to draw parallels with music. The very next term I wish to use is “counterpoint”’ (Youngblood 1970: 215). However, Whitney dismisses attempts to correlate colour with music by visual music pioneers: ‘they were so hung up with parallels with music that they missed the essence of their

medium’ (Youngblood 1970: 220). He prefers to approach his own musical parallels more loosely: ‘the essential problem with my kind of graphics must resemble the creative problem of melody writing’ (Youngblood 1970: 220).

3.2 Audio-visual art in the late twentieth and early twenty-first centuries

Progress in personal computing hardware played an important role for the dissemination of digital art in the 1990s, when ‘affordable personal computers were powerful enough to manipulate images, render 3D models, design Web pages, edit video and mix audio with equal ease’ (Tribe and Jana 2007: 10).

Artistic digital sound and music is a vast territory, that includes: ‘pure sound art (without any visual component), audio-visual installation environment and software, Internet-based projects that allow for real-time, multiuser compositions and remixes, as well as networked projects that involve public places or nomadic devices’ (Paul 2003: 133).

These digital sound and music projects are frequently interactive, and some of them incorporate visuals: ‘(they) also commonly take the form of interactive installations or “sculptures” that respond to different kinds of user input or translate data into sounds and visuals’ (Paul 2003: 136).

Many of these projects that combine music and visuals digitally ‘stand in the tradition of kinetic light performance or the visual music of the German abstractor and painter Oskar Fischinger’ (Paul 2003: 134).

Golan Levin is one of the artists who have explored interconnected audio-visual creative expression, in works such as *Audio-Visual Environment Suite* (1998–2000), ‘an interactive software that allows for the creation and manipulation of simultaneous visuals and sound in real time’ (Paul 2003: 133).

In 1994, Netscape released the first commercial Web browser, ‘signaling the Internet’s transformation [...] into a

popular medium for personal communication, publishing and commerce’ (Tribe and Jana 2007: 6). For many artists, the advent of the Internet represented the emergence of a medium in its own right, of a ‘new kind of space in which to intervene artistically’ (Tribe and Jana 2007: 11).

Some of the projects exploring interactive music and graphical interfaces use the Web as a medium. In 1999, John Klima created *Glasbead*, an ‘online art work that enables up to 20 simultaneous participants to make music collaboratively via a colorful three-dimensional interface’ (Tribe and Jana 2007: 54).

In 1998, Sergi Jordà created the first version of *FMOL*, ‘an Internet-based music composition system that could allow cybercomposers to participate in the creation of the music for La Fura’s next show, F@ust 3.0 [...] freely inspired by Goethe’s work’ (2005: 326). Like *Glasbead*, it allowed for online collaborative music composition.

In 2005, Sergi Jordà and his team at Universitat Pompeu Fabra created *Reactable*, a multi-user electro-acoustic music instrument with a tabletop tangible user interface. *Reactable* has dynamic visual-feedback capabilities: ‘a projector [...] draws dynamic animations on its surface, providing a visual feedback of the state, the activity and the main characteristics of the sounds produced by the audio synthesizer’ (Kaltenbrunner et al. 2006: 1).

In 2006, Nintendo released *Electroplankton*, developed by artist Toshio Iwai. *Electroplankton* is a collection of ten ‘musical toys’, where ‘a playful visual style is employed to give the impression that each takes place in some sort of bizarre petri dish – or perhaps a very musical aquarium – filled with different species of plankton that can produce sound and light when you interact with them’ (Davis 2006). The ‘plankton’ entities have a simulated biological behaviour, ‘serving as a visual and functional metaphor enabling the simultaneous generation of visuals and music’ (Stockburger 2009: 122). *Electroplankton* is also a kind of archive of

Iwai's previous work, such as *Composition on the Table*. According to Axel Stockburger, *Electroplankton* is a good example of the fusion of different roles – composer, performer and audience ‘converge in the playing subject’ (2009: 122).

After *Electroplankton*, Iwai developed *Tenori-On* for Yamaha, a new kind of music instrument consisting of ‘a hand-held silver tablet framing a square grid of 16×16 flashing LED buttons’ (Walker 2008). *Tenori-On* is therefore an audio-visual device, suited for performances due to its two-sided design: ‘both faces look identical, but one is played by the performer, while the other provides a miniature light show for the audience – providing a visual rendering of every sound’ (Walker 2008).

4. Project development

4.1 Music

Instead of composing new music for *AVOL*, the author decided to reuse music he had recently composed, which had a modular structure suitable for the project. These music tracks were similar and coherent in terms of sound palette, which made them adequate for the interchangeable logic of *AVOL*. André Carrilho used these four tracks as inspiration for the *AVOL* animations.

The music had to be adapted in order to fit within the operational logic of *AVOL*. All loops were converted to the same tempo (120 beats per minute). The duration of the music loops had to be changed, since in *AVOL* all loops should have the same duration (sixteen seconds) to insure synchronization.

AVOL was developed using Adobe Flash software. One of the limitations of Flash at the time was that only a maximum of eight sounds could be played back simultaneously. Therefore, the author decided to divide the four music tracks into seven loops, leaving one possible extra sound to be played (a collision sound was planned). As the original tracks were composed of a different number of loops, these loops

had also to be regrouped.

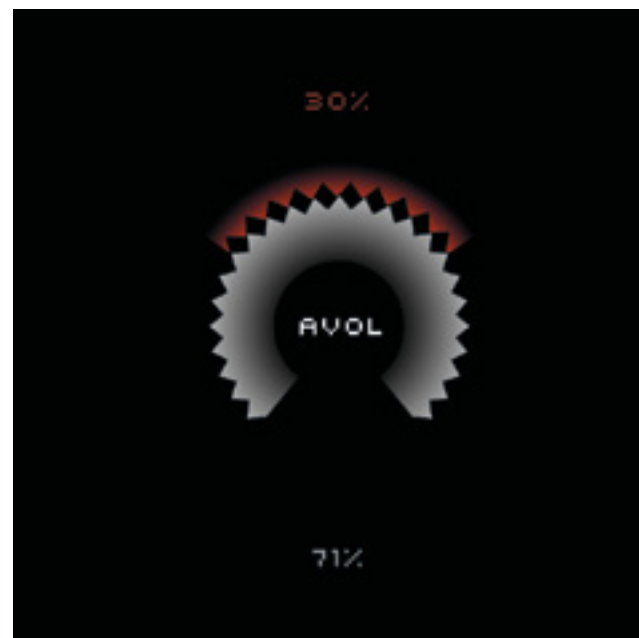
The author aimed to group the different sound loops into coherent entities as much as possible, similarly to band members on a stage. He decided that four of the loops should be rhythmic (bass drum, snare drum, hats and clicks) and the remaining three loops should be melodic (keyboard, guitar and pad). With a few exceptions, this division was maintained across tracks. André Carrilho developed the animations taking this distribution into account.

Therefore, *AVOL* contains 28 sound loops – four loop permutations (corresponding to the four original songs) for each of the seven IAVOs.

4.2 Interaction design

When users load *AVOL*, they are presented with a black screen containing a circular pre-loader, which resembles one of the IAVOs to be found upon entering the project. Therefore, the pre-loader is also an introduction to the aesthetics of *AVOL*. The pre-loader is composed of two concentric arcs, their growth representing, respectively, the loading process of one individual sound and the number of sounds loaded (Figure 2).

Figure 2: *AVOL* pre-loader.



After the pre-loader is concluded, seven small white circles appear, distributed on the black screen. Each of the circles represents an IAVO. The circles appear randomly, but distributed on a horizontal sequence. The first four correspond to the rhythmic sounds, and the last three to the melodic sounds. *AVOL*'s screen is resizable – when users adjust the size of the browser, *AVOL*'s ‘stage’ is scaled.

The aesthetically minimalistic starting point for *AVOL* is intentional. It is meant to be mysterious, to stimulate curiosity and to motivate the discovery process by users. As Donald Norman states, ‘one important method of making systems easier to learn and to use is to make them explorable, to encourage users to experiment’ (2002: 183).

When users roll over one circle, four white petal-shaped buttons appear. These trigger each of the four loops associated with the IAVO. The first time a user activates one of the loops, it starts playing immediately, and *AVOL*'s internal clock is started. New elements also appear on the IAVO's interface: three ‘traffic light’ (red, yellow and green) buttons (also petal-shaped), and a ‘ring’ encompassing the ‘petal’ buttons, incorporating a minus and a plus button. The petal corresponding to the loop currently playing disappears, applying Donald Norman's notion that ‘a good designer makes sure that appropriate actions are perceptible and inappropriate ones invisible’ (2002: xii).

The ‘traffic light’ user interface elements in the IAVOs are meant to control the playback of each object: the red button stops its playback while the green button ‘solos’ it, stopping all the remaining ones. By using a traffic light metaphor, Video Jack hope to make these functionalities more intuitive. As Jakob Nielsen states, ‘metaphor can facilitate learning by allowing users to draw upon knowledge they already have about the reference system’ (2000: 180). When the yellow button is pressed, the IAVO starts moving in a random direction. Clicking on the outer ring stops the object (if it is moving) or

allows the user to drag the object on the screen. The graphic design of the ring, with its rough edges, is meant to convey this ‘drag’ affordance. According to Donald Norman, affordances refer to ‘the perceived and actual properties of the thing, particularly those fundamental properties that determine just how the thing could possibly be used’ (2002: 9). The plus and minus buttons embedded in the ring control the sound playback volume and consequently the size of the animation (Figure 3).

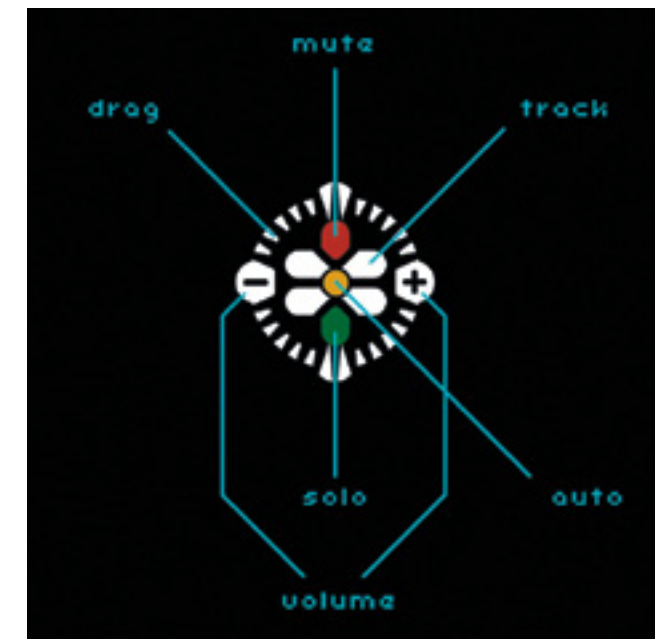


Figure 3: IAVO user interface detail.

André Carrilho conceived the ‘petal’ aesthetics of IAVO buttons in order to be harmonious with the animations, which also resemble flowers. Each song has its colour palette and type of animation (e.g. animations triggered by every third petal are blue), but they were designed to integrate with each other. The aesthetics of the interface is meant to enhance the experience of the user and to emphasize the act of manipulation: ‘the mouse and the pen-based interface allow the user the immediacy of touching, dragging, and manipulating visually attractive interfaces’ (Bolter and Grusin 2000: 23).



Figure 4: One IAVO is playing, another is about to start.

One of the difficulties the author faced when programming *AVOL* was the issue of sound synchronization (Adobe Flash is not very efficient in maintaining strict timing). In order to solve this problem, he conceived a synchronization solution based on cycles of equal length. After the first sound has been selected, *AVOL*'s internal clock starts, counting cycles of sixteen seconds (the duration of all sound loops). To insure synchronization, all playing sounds are restarted every sixteen seconds. Therefore, when a user chooses another sound, it does not play immediately, but only after the sixteen-second cycle restarts. An animated circular graphic is then shown within the IAVO highlighting the remaining time until the next cycle (Figure 4).

Since objects can move on the screen, either by automatic random motion (by pressing the yellow button) or by drag-and-drop, they can also collide with each other. Video Jack saw object collisions as an opportunity to add an element of sonic spontaneity to *AVOL*. Each audio loop has a collision sound counterpart. Whenever two IAVOs collide, the static IAVO releases a collision sound. To avoid cacophony, only one IAVO can be moving automatically at a given time. Users can create compositions using collision sounds (and often do, as observed by the author in *AVOL* installations), by positioning objects so that they inter-



Figure 5: Several objects playing simultaneously.

sect with the moving IAVO.

A Video Jack logo in the lower right corner links to the Video Jack website. On rollover it reveals the credits of the project.

4.3 Designing sound visualization and reactivity

The audio reactivity in *AVOL* animations is based on scale. The size of the animation of each IAVO is increased when the sound amplitude of the correspondent loop becomes higher, and decreases when the sound amplitude is lower. The total variation of size is determined by the sound playback volume – a higher playback volume will result in a larger animation. Since many sound loops in *AVOL* contain silence, Video Jack initially faced a difficulty with this behaviour – the animation would often almost disappear (whenever silence was reached) and the current playback volume was not apparent then. The solution they conceived was to separate each animation into two – one audio-reactive animation, and another one which was not audio-reactive. This second animation (complemented with a circular boundary) would scale proportionately to the sound volume. Therefore, it was insured that the animation as a whole would be visible even when its correspondent sound loop was silent, and that the current playback volume was always apparent.



Figure 6: *AVOL* installation at Jyväskylä Art Museum.

The sounds in *AVOL* are stereo. Most of the animations are scaled taking into account an average of the amplitudes of the left and right channels. Animations reacting to 'pad' type of sounds (synthesizer sounds similar to strings), however, react differently to the left and right signals. Since pad sounds evolve slowly, and with more stereo complexity than other sounds, Video Jack found it interesting to map left and right sound channel information to the horizontal and vertical scaling of the correspondent animations.

Using the same formula, with the same parameters for the sound reactivity behaviour of all the animations, would result in some animations changing much more in size than others. Some of the sounds in *AVOL* are softer, and have less dramatic changes in amplitude than others, resulting in an overly subtle (sometimes barely noticeable) sound reactivity behaviour. To level this discrepancy, the author introduced the idea of a 'sensitivity multiplier' – a number allocated to each sound loop, which would be multiplied by the number resulting from the sound analysis mechanism, when scaling an animation. This resulted in a more even sound reactivity behaviour of the different animations.

The animations in *AVOL* (Figure 5) resemble John Whitney's floral compositions. Quoting a description of one of his animations, by Gene Youngblood (which could well apply to *AVOL*): 'all



Figure 7: *AVOL* performance at Abertura Festival.

colors move into the ring simultaneously from all sides, forming circles within circles all scintillating smoothly in a floral configuration' (1970: 220). There is also some resemblance between *AVOL*'s flower-like objects and the plankton in *Electroplankton*, even more apparent when collisions occur. The objects in *AVOL*, due to their 'draggable' nature and audio reactivity, also resemble the animated modules in *Reactable*. Like *Electroplankton* and *Reactable*, *AVOL* fuses performer and audience together into one entity (the user). *AVOL*, together with many of the related examples quoted, are indebted to Oskar Fischinger's music-inspired abstract animations.

4.4 Software

Video Jack decided to use Adobe Flash to develop *AVOL*, taking advantage of recent developments in that platform – namely the release of Flash CS3 in 2007, including the ActionScript 3 programming language, with sound analysis capabilities.

5. Presentations

AVOL was presented as installation at several new media art and design festivals in 2008: Cartes Flux, Espoo, Finland (May); Re-New, Copenhagen (May); Create, London (June); and Live Herring, Jyväskylä, Finland (October/November, Figure 6). These installa-

tions were composed of a projection on a wall (with one exception, Cartes Flux, where a flat-screen monitor was used) and speakers. Users could manipulate *AVOL* with a mouse (the keyboard and computer were hidden, except in Create).

Video Jack presented *AVOL* as performance in the same year: at Abertura Festival, Lisbon (August, Figure 7); and at Electro-Mechanica Festival, St. Petersburg, Russia (November). At Abertura Festival, the author and André Carrilho performed *AVOL* using their two computers simultaneously, splitting the IAVOs between them – the author using the four rhythmic objects, and André Carrilho using the three melodic ones. The audience could see two contiguous projections, one for each computer. At Electro-Mechanica Festival, the author performed *AVOL* by himself, using a single projection (André Carrilho added some extra visual elements and effects, sparingly, using a video mixer). Documentation relative to these presentations can be found in Video Jack's 'blog' section of their website (<http://www.videojackstudios.com/c/blog/>).

6. Recent developments

The release of Video Jack's new website in September 2009 (<http://www.videojackstudios.com>) motivated the author to make some adaptations and additions to *AVOL*. The first decision was to create a 'mirror' of the project in Video Jack's own server, instead of relying exclusively in DGA's server. That also allowed the author to make some changes to the sound loops – he was displeased with three of the 28 loops, as he felt they did not fit well with the remaining ones. They were slightly adapted. That change occurred in January 2010.

The author felt that the project was not documented well enough in terms of videos and music. In March 2010, he uploaded video captures of *AVOL* and music using *AVOL* loops, to the Video Jack website (and related websites, such as YouTube and Vimeo). These

additional media elements (particularly the videos) are meant to provide alternative and complementary ways for users to experience the project, and also to quickly realize the possibilities of *AVOL* (<http://www.videojackstudios.com/projects/avol/>).

7. Conclusions

7.1 Strengths and weaknesses

The author considers that *AVOL* was successful in introducing the concept of interactive audio-visual objects – entities composed of GUI elements controlling sound and animation, and also audio-reactive animations visualizing sound. He considers that the project is playful, engaging and allows for integrated audio-visual manipulation and expression.

The project also represents a turning point for Video Jack, as it was responsible for a change in focus in their work. Before, their focus was in performances, and in creating tools that they would use for themselves. With *AVOL*, they started designing for other users and having the Web as a main platform. This new focus would be important in redefining their previous *Heat Seeker* project (an online version was later released), and for their next project, *Master and Margarita*.

However, the author detects several limitations in *AVOL*.

One of the limitations of *AVOL* is its closed nature. There is a fixed amount of sounds and animations to interact with. Being an Internet-based project, it would be desirable to implement functionalities to load external sounds and/or animations.

Another limitation of *AVOL* is its inability to record the interactions of users. It would be interesting to have some recording ability, which would allow users to share the results of their interactions on the Web.

Online collaboration features would be an important addition to *AVOL*. Currently, it only allows for the interaction of one user in each individual session of the project.

Audio manipulation is limited to start, stop, solo and volume control of loops. Additional audio manipulation would be desirable, in order to make *AVOL* more playful and versatile, allowing for a greater expression.

The author considers that each IAVO should have an identification that distinguishes it visually from others, such as a colour code. That would make it easier for users to trigger specific sounds and animations, particularly after the objects have moved from their initial locations.

The automatic movement functionality of each IAVO could be improved. The author believes that the user should have more control over the direction and speed of the movement, which is currently random. One option would be to implement a 'throw' type of behaviour to the objects.

One additional limitation is the difficulty of doing fast dramatic changes, besides 'soloing' one object. It is difficult to change multiple parameters quickly in *AVOL*, which hampers its expressiveness. In the author's opinion, this particularly limits the functionality of *AVOL* as a performance project.

7.2 Feedback from the presentations

The *AVOL* presentations allowed for additional conclusions to be reached. Regarding installations, the author considers that the most successful ones were those using large projections on a wall (instead of a LCD screen). A large projection allows for a more immersive experience, hiding the frame of the image. Since the background of the project is black, it blends with the wall, and the objects seem to be floating on the projected space.

The author considers that *AVOL* is better suited for being presented as a web project or as an interactive installation than as a performance. Its characteristics highlight the 'hands-on' aspects of the project, and some features are missing that could be more captivating to a passive audience – for example, a way to introduce more dramatic changes in multiple objects. In

order words, the author considers that *AVOL* is a project that is more 'fun' to play than to watch.

7.3 Future developments

Future developments of *AVOL* should address the limitations detected. In *Master and Margarita*, the project following *AVOL*, Video Jack attempted to combine its IAVO approach to a more narrative-based project in the line of *Heat Seeker*. Video Jack are currently working on a follow-up project to *AVOL*, which will allow for loading sounds from an Internet database, greatly opening up the sonic palette; and for matching them with a built-in library of animations. Additional sound manipulation capabilities will also be explored. Sounds and animations will be grouped into 'families' for a higher coherence, identifiable with colour.

There is still a vast territory to explore regarding an integrated audio-visual expression – particularly one where, quoting Stockburger 'composer, performer and audience converge in the playing subject' (2009: 122). This territory is the playground of a new type of artist as Dähn states – one who is both musician and visual artist, or a collective of sound and motion graphics artists. With these new creative forces, 'a unique audio-visual language can be developed, just as each musician or band develops its sound' (Dähn 2009: 153).

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7 Article 3:

Master and Margarita – an Audiovisual Adaptation of Bulgakov's Novel for the Web and Performance

Keywords

Cross media
audiovisual
interactive narrative
new media art
performance
net art
interaction design
ubiquitous media

Abstract

This paper presents *Master and Margarita*, an interactive audiovisual project for web and performance adapting Mikhail Bulgakov's novel of the same name. It aims to address two main research questions. First: how to integrate music and motion graphics in an interactive audiovisual project for the web and performance, in a way that is versatile, easy to use and engaging to experience? Second: how to adapt a novel into an interactive audiovisual project, not only being faithful to the narrative, but also creating a coherent and autonomous work, expressing the artistic vision of its authors? In this paper, the collaborative process between the authors of the project is discussed, as well as their motivations. The development of the project, in its different iterations, is analyzed. Conclusions are then presented, assessing the answers to the research questions. Future work is also discussed.

Categories and Subject Descriptors

J.5 [Arts and Humanities]: Arts, fine and performing; Literature; Music

General Terms

Design, Experimentation, Human Factors.

1. Introduction

Master and Margarita is an audiovisual adaptation for the web and performance of Mikhail Bulgakov's novel of the same name, based on the premise of a visit by the Devil to the Soviet Union [3]. It is a project by Video Jack, a duo composed of the author (musician and programmer) and André Carrilho (illustrator and animator). It was first developed as a performance project (between 2008 and 2009) and later released as a web project (in the end of 2009), incorporating new functionalities in order to make it more engaging, flexible, and easy to use.

The *Master and Margarita* project intends to further develop concepts and approaches explored in two previous works by Video Jack: *Heat Seeker* (2006; online version 2009)¹ and *AVOL* (2007).² *Master and Margarita* came about from the desire of creating a follow-up project to *Heat Seeker* that

¹ <http://www.videojackstudios.com/heatseeker/>
² <http://www.videojackstudios.com/avol/>

would be visually and sonically more coherent, and that would incorporate some of the sound manipulation and audio reactivity aspects of *AVOL*. In order to develop a project with a higher narrative and visual consistency, and also musical coherence, Video Jack decided to adapt a novel. A book adaptation raised a new challenge: to strike a balance between being faithful to the narrative and universe of the writer, while maintaining an autonomous artistic vision, in line with previous Video Jack projects. Resemblance with themes explored in *Heat Seeker* (film noir, fantasy, sexuality, violence, humor), together with a highly visual writing style and several musical references, made *Master and Margarita* an ideal candidate for adaptation to a Video Jack audiovisual project. The prospect of an adaptation of the novel became more attractive following a proposal for performing in Russia—it seemed appealing to witness the reaction of a Russian audience to the material. *Master and Margarita* is not a full adaptation of the book. It is a work inspired by the novel, borrowing a substantial amount of elements from it. However, for convenience of expression, the word “adaptation” will be used, meaning “borrowing”, a form of adaptation where an artist employs “the material, idea, or form of an earlier (...) text” [1, p. 98]. The term borrowing is also related to the concept of remediation, where “content has been borrowed, but the medium has not been appropriated” [2, p. 44], as is the case with *Master and Margarita*.

The project aims to answer two main research questions. First: how to integrate music and motion graphics in an interactive audiovisual project for the web and performance, in a way that is versatile, easy to use and engaging to experience? Second: how to adapt a novel into an interactive audiovisual project, not only being faithful to the narrative, but also creating a coherent and autonomous work, expressing the artistic vision of its authors?

2. Project Development

2.1 Content Development

The first step in the development of the content was the script, written by the author in mid-2008. The script summarized parts of the book that would be suitable for the animation style of André Carrilho, based on previous experience of working together. The decision regarding which chapters to adapt was also based on the relevance of each chapter to the understanding of the whole novel (with the exception of the biblical part, which was excluded).

With the adaptation, Video Jack aimed to transpose Bulgakov's writing style to music and animation. Visually, Video Jack intended to mix photos and other found or non-drawn elements (such as blots of ink) with 2D and 3D animation. This was a departure from *Heat Seeker*, which did not use photography or found elements, relying solely on vector graphics. Sonically, this collage approach is achieved by mixing different types of sound: field recordings related to the narrative (mainly from the online database Freesound);³ samples of music related to the themes of the book; additionally to electronic percussion and a few synthesizer sounds. Again, this distinguishes *Master and Margarita* from *Heat Seeker*, where music sampling had been seldom used. Video Jack wanted a departure from the “clean” vector-based images and synthesizer sounds of *Heat Seeker*, into a “dirtier”, more organic and detailed approach. Some techniques for generating randomness were used, such as “action painting” type of techniques on the visual side, and random granular sampling on the sonic side.

Nine chapters were chosen for the adaptation. The visual component by André Carrilho for the first two chapters preceded the sound counterpart, and it set the tone for the music and the remaining chapters. The starting point of these remaining chapters al-

³ <http://www.freesound.org/>

minated between the visual and the music sides.

2.2 Performances

The preview showcase of *Master and Margarita* at Electro-Mechanica Festival (November 2008, St. Petersburg), with a Russian audience familiar with the book, was useful for obtaining feedback in an important stage of the project development. After the performance, where the four chapters of the project adapted so far were shown, Video Jack had a discussion with the audience. The reactions often concerned the faithfulness of the adaptation. Several members of the audience manifested that Video Jack's version was true to the "spirit" of the novel, and understood that it was not intended to be a literal adaptation. This feedback was an important signal. As Andrew states, fidelity to the spirit, "to the original's tone, values, imagery, and rhythm" is more difficult than to the letter, since "finding stylistic equivalents (...) for those intangible aspects is the opposite of a mechanical process" [1, p. 100]. One member of the audience provided a valuable comment—that the adaptation so far focused only on the more violent elements of the narrative, and that the relationship between the characters of Master and Margarita was missing. Indeed, Video Jack felt that the four chapters previewed lacked thematic diversity, and that the remaining ones should address that.

The next development stage for *Master and Margarita* took place prior to the premiere of the full project, at PixelAche Festival (April 2009, Helsinki). Five additional chapter adaptations were developed. Between 2009 and 2011, the project has also been performed in Geneva (Mapping Festival), Porto (Future Places Festival), Tallinn (PÖFF Festival), Pärnu (Pärnu Film and Video Festival), Prague (Lunchmeat Festival) and Austin, Texas (South by Southwest Festival). The project won an honorable mention award at Future Places Festival, Porto, 2009. The jury of the festival justified their prize with

the following text: "(Video Jack's) performance piece mixes music, video, and digital technology to give a fresh interpretation of Mikhail Bulgakov's classic book about Stalinist Russia. This ever-evolving piece reinforces our understanding of how narratives change every time they are performed and every time they are re-visited".⁴

The software engine used for the *Master and Margarita* performances was the same as the one used for the *Heat Seeker* performances, without any adaptation. Buttons distributed in the edges of the screen, organized in a nine-by-nine grid, activate and deactivate four different types of animations. One type of animation is particularly flexible—small animations ("animated icons"), which can be placed on the screen by drag-and-drop or by random positioning (although constrained to the nine-by-nine grid). For sound manipulation, the author would play music using a laptop, equipped with a hardware controller, and running a music sequencer (Ableton Live), while André Carrilho would manipulate *Master and Margarita* visuals. This set-up was again similar to the one used for *Heat Seeker*, although smaller and more modular sound loops were used, in anticipation of the next development stage for the project (the web version).

2.3 Web Version

Similarly to *Heat Seeker*, Video Jack decided to develop an online version of *Master and Margarita*, based on the performance version. For the web version of *Master and Margarita*, Video Jack aimed to improve on *Heat Seeker* Online, by adding audio-reactive graphics and sound manipulation, and other visual transformation functionalities. *Master and Margarita* Online was released in December 2009 (Figure 1).⁵

With *Master and Margarita* Online, Video Jack wanted to reintegrate some of the functionalities of their perfor-

⁴ <http://futureplaces.org/2009/10/and-the-winner-is/>

⁵ <http://www.videojackstudios.com/masterand-margarita/>



Figure 1. *Master and Margarita* Online

mance software, absent in *Heat Seeker* Online, adapting keyboard-based functionalities to the GUI (graphical user interface). Among those functionalities are opacity and size controls for animations, converted in the online version to sliders in the left, right and bottom edges of the screen. A full screen option was also implemented. To add an extra image manipulation possibility, the animations corresponding to the left edge buttons were converted into "masks" that would show and hide parts of other animations. In order to add audio manipulation capabilities and audio reactivity, Video Jack decided to use the "animated icon" type of graphic. These elements adopted a similar logic to the "interactive audiovisual objects" in *AVOL*—animations that are audio-reactive, contain GUI elements to control sound, and that also can be placed on the screen either by drag-and-drop functionality or by activating a random position option. However, instead of the seven audiovisual objects in *AVOL*, the author decided to implement only four audiovisual loops, in line with the four audio loops being used per chapter in performances.

The *Master and Margarita* environment is more saturated of GUI elements than *AVOL*. Additionally, Video Jack wanted to maintain the possibility, present in *Heat Seeker*, to create multiple instances of each animated

icon, which adds to that saturation. Therefore, they wished to implement a simpler audio manipulation interface than *AVOL*. Ideally, this would be achieved with one or two buttons within an animated icon at a given time, instead of the nine buttons present in an *AVOL* audiovisual object. In *AVOL*, these nine buttons correspond to: four loop selection buttons; volume control; mute; solo; and a random positioning button. Loop selection was not to be part of the *Master and Margarita* animated icons interface—each chapter would have their own set of four loops (one per animated icon), and these would not be interchangeable with loops from other chapters. Therefore, a single play button would be needed. There should be also a mute button, but Video Jack decided to omit the solo button, in order to simplify the interface. The random positioning is achieved using a button in the main interface.

Volume control was needed, and additionally Video Jack wanted to implement an independent size control per animated icon. In order to include these different functionalities in a simple and unobtrusive way, it was decided that volume, size and mute controls should appear only after play had been pressed. In order to keep the GUI in each icon to a minimum, the author conceived a drag and drop

GUI element (a “draggable pad”) that would move in the horizontal and vertical axis, therefore affecting two different sets of parameters: sound volume and opacity, in the vertical axis; and size of animation, in the horizontal axis. The diagonal lines in the “draggable pad” convey its “click and drag” affordance. As Donald Norman states, “affordances provide strong visual clues to the operations of things” [4, p. 9]. The mute button would double as a reference point and boundary for the movement of the “draggable pad”. In case there were different instances of a given animated icon on the screen, a change in opacity would affect all the animations of the same type. However, a change in size would affect only the individual animation, allowing for multiple instances of the same animated icon to have different sizes, in line with the performance version. As in *Heat Seeker Online*, a main menu was created, providing to the users direct access to each of the nine chapters.

2.4 Videos

Video Jack recorded the video and audio outputs from their computers during their PixelAche Festival performance (Kiasma Theatre, Helsinki). The resulting videos were uploaded to Internet video sites such as Vimeo and YouTube, and embedded in a web page presenting the project.⁶ Additional videos were later uploaded, such as videos from the PÖFF Festival performance, and screen captures of *Master and Margarita Online*. These videos constitute an alternative way to experience the project, and provide an introduction to the interactive web version.

3. Conclusions

In the author’s opinion, the adaption was faithful to the spirit of the novel by exploring the conceptual level of the book; delving into the themes, style and atmosphere of the work; and presenting an idiosyncratic artistic in-

⁶ <http://www.videojackstudios.com/projects/master-and-margarita/>

terpretation of these elements as visual and sonic media. However, more chapters could have been adapted to provide a broader representation of the novel. Audiences who have not read the book are introduced to the work, and hopefully will be motivated to read it. Those who have already done it can compare their own interpretation of the novel with Video Jack’s adaptation. The author considers that the aim of achieving a greater coherence of content than in *Heat Seeker* was accomplished in *Master and Margarita*. Adapting a novel helped establish a set of guidelines and aesthetic directions from the start of the project, both visually and sonically. Besides the direct influence of the narrative on both sound and visuals, there were several shared concepts between the two fields and the novel, such as collage, dementia, saturation, “dirtiness”, and randomness.

As designer and user of the software, the author believes that the GUI additions to *Master and Margarita Online* allow for a richer visual manipulation and a more fluent expression than *Heat Seeker*. The audio-reactive animations and audio manipulation capabilities add a higher degree of audiovisual integration compared to the performance version, bringing it closer to previous project *AVOL*. In the author’s opinion, the added audio and visual manipulation capabilities came with a cost: the GUI became more complex, and the discovery and learning process became longer for new users. The added complexity of the interface required that instructions had to be set up.

The coherence of the project, associated with the adaptation approach to the original novel, allowed for the creation of audiovisual content which is in “reciprocal agreement and co-operation”, a condition stated by Richard Wagner as necessary to pursue the ambitious “total art work” or *gesamtkunstwerk* [5, p. 5]. The audio-reactive visuals contribute to this “agreement and co-operation” between music and animations. The author believes that

the added coherence, functionalities and agreement between audio and visuals create a more engaging experience than previous project *Heat Seeker*, despite the more complex GUI.

Regarding future developments, a questionnaire will be conducted to assess if the author’s preliminary conclusions as user and developer extend to other users of the project. *Master and Margarita* could be transposed to other platforms, such as mobile touch-screen devices. Video Jack are also interested in continuing their approach in this project by developing other adaptations to interactive audiovisual projects—not necessarily from literature, but possibly from other media such as cinema.

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8 Article 4:

AV Clash – Online Tool for Mixing and Visualizing Audio Retrieved from Freesound.org Database

In this paper, the project *AV Clash* will be presented. *AV Clash* is a Web-based tool for integrated audiovisual expression, created by Video Jack (the author and André Carrilho, with the assistance of Gokce Taskan). In *AV Clash*, users can manipulate seven “objects” that represent sounds, incorporating audio-reactive animations and graphical user interface elements to control animation and sound. The sounds are retrieved from online sound database Freesound.org, while the animations are internal to the project. *AV Clash* addresses the following research question: how to create a tool for integrated audiovisual expression, with customizable content, which is flexible, playful to use and engaging to observe? After an introduction to the project, a contextualization with similar works is presented, followed by a presentation of the motivations behind the project, and past work by Video Jack. Then the project and its functionalities are described. Finally, conclusions are presented, assessing the achievement of the initial aims, and addressing the limitations of the project, while outlining paths for future developments.

1. Introduction

AV Clash is a Web-based project by Video Jack (the author and André Carrilho, with the assistance of Gokce Taskan), which allows for the creation of audiovisual compositions, consisting of combinations of sound and animation loops. *AV Clash* is composed of seven audio-visual units, which enable playback and manipulation of four different loops of sound and audio-reactive visuals (one combination of audio and visuals at a time). These units were named “Interactive AudioVisual Objects” (“IAVOs”) since they are composed of user interface (UI) elements that trigger and manipulate sounds, together with animations that react to those sounds. The sounds in *AV Clash* are retrieved from Freesound.org, an online sound database. The anima-

tions were developed by André Carrilho.

AV Clash is still being developed, and tested, by Video Jack. Therefore it is not online yet, although Video Jack have already registered the domain www.avclash.com, where the project will be hosted. For now, this domain points to a page where demonstration tracks recorded with *AV Clash* can be listened to. No public presentations (performances or exhibitions) have been made with the project yet.

2. Contextualization

AV Clash follows a long tradition of explorations towards integration of sound and image. Ancient Greek philosophers, such as Aristotle and Pythagoras, considered that there was a correlation between the musical scale and the rainbow spectrum of hues [4]. The color to music correlation was further explored in the Renaissance by several artists, including Leonardo da Vinci, and later by Isaac Newton [9, pp. 45-46]. Newton’s experiments influenced the creation of the *Ocular Harpsichord*, an early “color organ” by Father Louis Bertrand Castel, around 1730 [4].

Wallace Rimington created his electric *Colour Organ* in 1893, which “mixed primary colors into more nuanced hues that could be projected on gently moving gauzy curtains to obtain polymorphous color flows” [3]. This *Colour Organ* inspired composer Alexander Scriabin to write “a scenario of changing colors into the score of his 1910 Prometheus symphony” [3]. The tradition of color organs continued into the mid 20th century, and influenced abstract filmmakers – “for the cinema, with its standardized methods of production, reproduction and exhibition, seemed the ideal vehicle for Color Music” [3].

In the 1920s, Oskar Fischinger and Walther Ruttmann created “visual music” films in Germany – a combination of tinted animation with live music [4]. Oskar Fischinger moved to Hollywood in 1936, becoming an inspiration to a younger generation of visual music

artists, such as Jordan Belson, Harry Smith and brothers John and James Whitney. The Whitney brothers “decided to take up abstract animation after seeing a screening of Oskar’s films” [3]. John Whitney is “widely considered ‘the father of computer graphics’” for his explorations of computer-generated visuals through mathematical functions [6, p. 15]. He was among the first generation to use computers for the creation of artworks in the 1960s.

Progress in computing hardware played an important role in the dissemination of digital art from the late 20th century onwards. Sound is one of the major areas of exploration for digital artists. Artistic digital sound and music is a vast territory, that includes: “pure sound art (without any visual component), audio-visual installation environment and software, Internet-based projects that allow for real-time, multi-user compositions and remixes, as well as networked projects that involve public places or nomadic devices” [6, p. 133].

These digital sound and music projects are frequently interactive, and some of them incorporate visuals: “(they) also commonly take the form of interactive installations or ‘sculptures’ that respond to different kinds of user input or translate data into sounds and visuals” [6, p. 136]. Many of these projects that combine music and visuals digitally “stand in the tradition of kinetic light performance or the visual music of the German abstractor and painter Oskar Fischinger” [6, p. 134]. Among the artists that explore integrated audiovisual expression by digital means are: Golan Levin, notably with his *Audiovisual Environment Suite*; Toshio Iwai, with projects such as his recent *Electroplankton* and *Tenori-On*; and John Klima, namely with *Glasbead*, an “online art work that enables up to 20 simultaneous participants to make music collaboratively via a colorful three-dimensional interface” [8, p. 54].

Internet proved to be a fertile territory for developing digital sound and music projects, exploring the possibilities of connecting different musicians,

and their audiences. In 1998, Sergi Jordà created the first version of *FMOL*, “an Internet-based music composition system that could allow cybercomposers to participate in the creation of the music for La Fura’s next show, *F@ust 3.0* (...) freely inspired by Goethe’s work” [2, p. 326]. Like *Glasbead*, it allowed for online collaborative music composition.

*Freesound Radio*¹ (2009) is another example of Web-based sonic collaboration. It is an online “experimental environment that allows users to collectively explore the content in Freesound.org by listening to combinations of sounds represented using a graph data structure” [7, p. 1]. *Freesound Radio* retrieves sounds from Freesound.org, “one of the most widely used sites for sharing sound files licensed under a Creative Commons (CC) license” [7, p. 1].

3. Motivation and Previous Work

AV Clash is Video Jack’s fourth major interactive audio-visual project, after *Heat Seeker* (2006), *AVOL* (2007) and *Master and Margarita* (2009).

Among previous Video Jack projects, the most direct predecessor of *AV Clash* is *AVOL*². *AVOL* allows for the integrated manipulation of sound and visual elements. The project is composed of seven “objects”, which enable triggering four possible combinations of sound and visuals. These “objects” integrate graphical user interface elements to manipulate the audiovisual combinations. Objects can be moved around the screen, and object collisions generate special animations and sounds.

After the conclusion of *AVOL* in 2007, and its presentation in several festivals in 2008, the author detected several limitations in the project. Among these limitations are: a fixed number of sound and animation loops; a small degree of audio and visual manipulation possibilities; difficulty in making simultaneous changes in

¹ <http://radio.freesound.org/>

² <http://www.videojackstudios.com/projects/avol>

multiple objects; absence of recording or sharing capabilities; difficulties in identifying each object; and lack of collaboration functionalities.

Video Jack started developing a new project in early 2010, entitled *AV Clash*, to address the limitations of *AVOL*. In order to allow for a greater audio flexibility, the author decided to connect this new project to an online sound database. Freesound.org, with its vast repository of *Creative Commons* licensed sounds and its tag-based audio categorization, seemed to be adequate. The precedent of *Freesound Radio*, which is successful in retrieving sounds from Freesound.org for sonic composition, also pointed out in this direction. The animations would still be developed by Video Jack, but it would be possible for users to choose among a list of different animations associated with a certain tag. The author invited a former student, Gokce Taskan, to collaborate on the programming side of the development. Because of the importance of vector animation for the project, *Freesound Radio*'s successful usage of Flash, and the experience gained with previous projects, Video Jack decided to continue using Adobe Flash for the development of *AV Clash*.

AV Clash expands on *AVOL*, by addressing the following research question: how to create a tool for integrated audiovisual expression, with customizable content, which is flexible, playful to use and engaging to observe?

4. Description of the Tool

4.1 Image and Sound Association

Each IAVO has a "tag" associated to it, which is retrieved from Freesound.org. In a first stage of development, 10 Freesound.org tags will be supported, chosen from its most popular tags. *AV Clash* contains seven animations per tag, in a total of 70 animations. The tag of each IAVO acts as a filter to the possible four sounds and four animations it may contain. Each tag is associated with a color. During one *AV Clash* ses-

sion, the user may change sounds and animations, and even the tag, of each IAVO. More tags and animations will be added in later stages of development.

4.2 Start Screen and Stage

When users enter *AV Clash*, they are presented with a screen composed of seven colored vertical bars, of equal width – the stage. Each bar, colored according to the associated tag, represents a different activation point for each IAVO. When the project starts, the sounds are loaded from online sound database Freesound.org. As the 28 sounds are loading, a circular pre-loader appears near the bottom of the screen, to represent the loading process of the four sounds associated with each IAVO. The name of the tag is shown above the circle. A percentage is shown in the center of the circle, displaying the total loaded percentage of the four sounds.

The selection of initial tags, sounds and animations is random. Seven random tags are selected by the software, and then four random sounds and animations are selected per tag, among the ones associated with that tag. The sounds are not picked among the totality of sounds available per tag, but rather from the 20 most popular sounds with that tag (based on number of downloads from Freesound.org).

After all 28 sounds have been loaded, the bars disappear – they split up in two at the point where the pre-loader was, and retracts into the top and bottom edges. The IAVOs appear in the place of the pre-loaders, but they are not playing yet.

The stage is resizable, adapting to changes in the browser size. However, there is a minimum size, beyond which it does not shrink further (800 by 600 pixels).

4.3 "Stopped IAVO" User Interface and Functionalities

When an IAVO is not playing, it shows a limited set of options. If the user is not rolling over the object with the cursor, only an outer "ring" is shown, and a central button, colored according to the object's tag. This ring allows for the IAVO to be dragged and "thrown" on the stage. When the cursor rolls over the object, additional options are shown: four audiovisual loop selection buttons, and a red button, which deletes the object (Figure 1.). The tag of the object is also shown above the IAVO.

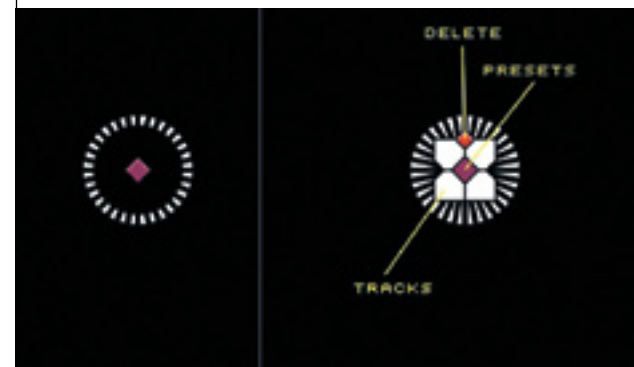


Figure 1. Stopped IAVO, in rollout (left) and rollover (right) states

4.4 "Playing IAVO" User Interface and Functionalities

The UI of each playing IAVO is composed of nine buttons and two sliders (Figure 2.).

4.4.1 Presentation of Main UI Elements

The UI is arranged around and inside the IAVO's "ring", which allows for dragging and throwing the object around the stage. The ring also incorporates two faders, shaped as semi circles on each of the sides. Inside of the ring are nine buttons, four of which arranged in a two-by-two grid (the "selection buttons"), with four additional buttons in the outside middle points of the grid (red stop button on top, green "solo" button on bottom, cyan audio

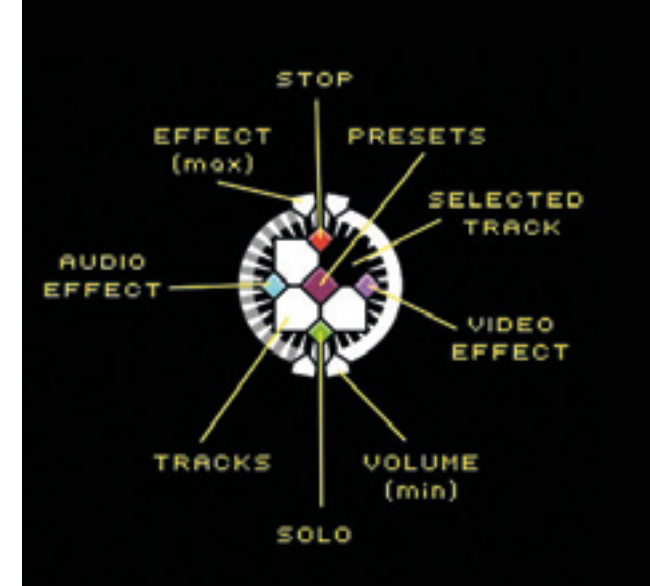
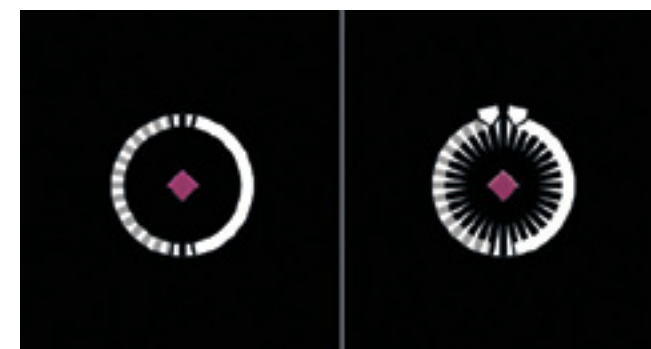


Figure 2. UI of playing IAVO, with second sound selected

effect button on the left, and magenta visual effect button on the right), and one more button in its center (the "back" button).

Different UI elements are visible, depending on user interaction and the position of the cursor relatively to the IAVO. In its "passive" state, when the user is not interacting with it, only the outer half of the ring and part of the faders are shown – the fader thumbs are hidden (Figure 3., left). When the user rolls over the outer half of the ring, its inner half appears, and also the fader thumbs (Figure 3., right), allowing for the manipulation of the faders. Rolling over within the inner half of the ring causes the whole UI of the IAVO to appear (Figure 2.), and also the tag of the object, shown above the IAVO.

Figure 3. UI of playing IAVO in "roll out" state (left) and outer ring "roll over" (right)



4.4.2 Buttons and Faders

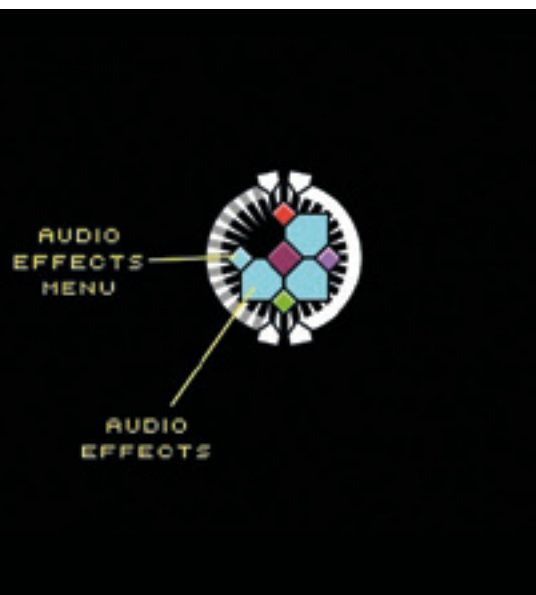
Pressing one of the selection buttons causes a switch in the audio and animation loops currently playing. The button relative to the audiovisual loop playing is always hidden.

Pressing the red button stops the sound and animation currently playing (the IAVO switches to “stopped” position). The green button “solos” the IAVO, stopping all the remaining ones. When an IAVO is stopped, all its settings (volume, effect selection and setting) are reset.

The center button (colored according to the tag assigned to the IAVO) reveals additional audio and animation selection and manipulation options (the “back” of the object, described below).

Pressing the cyan button modifies the four loop selection buttons, coloring them in cyan. The selection buttons become audio effect selection buttons. There are four audio effects per IAVO: filter, phaser, distortion and delay. The button relative to the selected effect is hidden. Selecting an effect or pressing the cyan button again reverts the selection buttons to white (they become loop selection buttons again). The filter effect is activated by default (Figure 4.).

Figure 4. UI of playing IAVO with audio effects selection buttons (cyan) activated



The magenta button behaves similarly to the cyan button. The selection buttons become magenta, allowing for selection of visual effect. Visual effects determine how the animation of the IAVO reacts to its audio loop. Each animation consists of two parts – one that is audio-reactive, and another one that is not. The non-reactive element serves the purpose of making the IAVO always visible, even when the visual effect makes its audio-reactive component occasionally disappear. The default visual effect is scale: the size of the animation decreases or increases proportionally to the amplitude of the sound. The remaining behaviors are: opacity (opacity of animations react to sound amplitude); blur (blur level of animations is inversely proportional to the sound amplitude); and RGB transformation (red, green and blue values of the animation are transformed proportionally to sound amplitude).

Independently of the color of the selection buttons, rolling out of the IAVO and rolling in again presents the loop selection buttons (and not the cyan or magenta effect buttons).

The left fader controls the intensity of the audio effect. Its default value is zero (minimum). The right fader controls the volume of the sound, and the size of the animation (both its reactive and non reactive elements). Its default position is in the middle.

4.5 Dragging, Throwing and Clashes

An IAVO can be dragged and repositioned on the stage. It can also be “thrown”, by dragging and releasing the IAVO in motion. The “throw” behavior causes the IAVO to continue moving in the direction and the speed it had when released, indefinitely, until the user clicks on it again, or presses the “back stage” button. If the IAVO reaches the edges of the screen, it starts moving in the opposite direction, with the same speed.

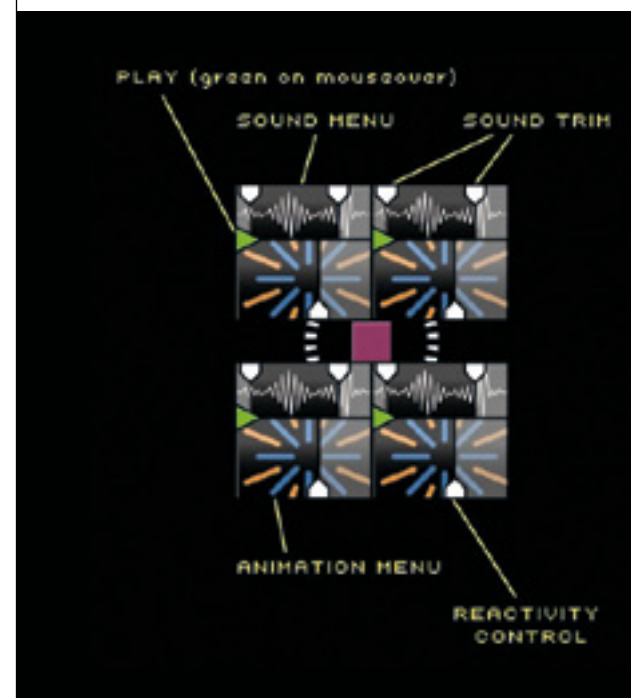
When a moving IAVO hits another object, a clash animation occurs, and a clash sound is triggered within the static object. The IAVO starts moving

in the opposite direction. The collision sound consists of a one second random segment, from one of the four sounds of the static IAVO that is currently not playing (picked randomly), with a delay effect applied to it.

4.6 IAVO User Interface and Functionalities – “Back”

When the user presses the center button of the IAVO, an animation occurs, transforming the UI of the object: the four selection buttons expand into four larger rectangles, and the central button is enlarged and rotated. All the remaining previous UI elements disappear, with the exception of the ring, which still is partially visible underneath the new four rectangles (Figure 5.)

Figure 5. Back of the IAVO, in rollover state



Each of the four new rectangles allows users to pick and adjust sounds and animations for the respective four loop selection buttons of the IAVO. Each rectangle is composed of two elements: a graphical representation of

the sound loop, on the top, and an image from the animation, on the bottom. Sliders on top allow for adjusting the start and stop positions for the loop. A slider on the bottom allows for adjusting the reactivity of the animation to the sounds, since some sounds might have a lower dynamic range than others. Moving this “audio-reactive sensitivity” slider to the right compensates for a lower sound dynamics. The default position of this slider is center.

By clicking in the sound image, a pop-up menu appears, allowing for the selection of other sounds from Freesound.org with the same tag. The pop-up menu includes the following information per sound: file name; short description; duration; author name. The pop-up appears up or down from the point where the user has clicked, depending where there is more space in the screen. When one sound is selected, a pre-loader animation is triggered – a circle starts to be drawn around the ring of the IAVO. When the circle is fully drawn, the sound has finished loading.

Clicking in the animation image activates a pop-up with images and names of other animations associated with that tag. Changes in the sound or image do not produce any immediate change in the current animation or sound playing in that IAVO (unless it occurs in the rectangle relative to the loop that is playing). In the left of the rectangle is a play button, which previews the current selection of sound and image, without closing the “back” of the object. The play button becomes then a stop button.

When the user presses the central button, the “back” of the IAVO is closed, with an animation that mirrors its opening (in reverse). If there were any changes in the sound or animation, within the rectangle relative to the loop that was playing before, these changes will now be reflected. In case the preview had been active previously to closing, that audiovisual loop remains playing. If the IAVO was stopped, it will remain stopped, unless the preview had been active.



Figure 6. Stage with four active bars, representing four deleted IAVOs

4.7 Deleting an IAVO, and Making it Reappear

When an IAVO is stopped, its red button is no longer a stop button, but instead a delete button (as was shown in Figure 1.). When this delete button is pressed, the object disappears, and the correspondent colored bar reappears, in the same position it had in the start of the application.

This reappearance occurs with an animation: the bar appears from the top and bottom edges of the stage. By clicking anywhere in this bar, the bar disappears again, and the IAVO reappears in that point (stopped). The bar disappears into the top and bottom edges of the screen by splitting in two at the point where the user has clicked (Figure 6.).



4.8 "Back Stage"

In the upper right corner of the stage, there is a "back stage" button. Activating the "back stage" option allows for introducing changes to multiple objects in the same screen, and also for changing the tag of each IAVO (Figure 7.).

Pressing the "back stage" button triggers a series of events. The "back stage" button becomes a "stage" button. If any object had its "back" visible, it will be closed first. All IAVOs move back to the area of their original bar, aligned vertically to the same position, near the bottom of the stage. All bars of active IAVOs reappear by expanding from the top and bottom of the stage to the vertical position of the IAVO, but do not close completely, stopping at the edge of its ring. Regarding the IAVOs that were not active, their bars open slightly, revealing their ring (aligned vertically with the remaining objects). Immediately after, all IAVOs reveal their "back", with the same animation described above. One more element is shown in this animation: a tag button appears above the objects, sliding from behind them. The sounds and animations that were playing previously continue to play. Two black bars appear on top and in the bottom of the screen. The top bar reveals load and save options, while the bottom bar shows the credits of the project.

Now users can change all animations and sounds of all IAVOs, similarly to how they could change the "back" of each IAVO individually. Additionally, users can change tags. By pressing the tag button that is now on top of each IAVO, a pop-up appears with a list of tags. (Figure 8.).

Figure 7. "Back stage" of *AV Clash*

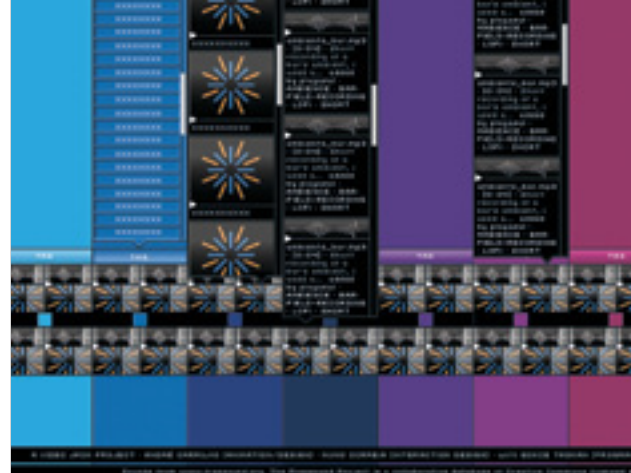


Figure 8. "Back stage" with several pop-ups open

A change in tag loads four new sounds from Freesound.org, chosen randomly among the 20 most popular ones with that tag. A pre-loader animation then takes place, similar to the circular initial pre-loader, and the sound change pre-loader (overlapped with the IAVO). When the loading process concludes, all sounds and animations of the IAVO are replaced. The IAVO reverts to its defaults, and if any sound or animation was playing, it is stopped. The bars disappear, mirroring the start of the project.

The "Save Set" button generates a file storing all the options for each IAVO: tag and list of the four sounds and animations; volume and effect level information; and audio and visual effect. The "Load Set" button loads a previously recorded file, consequently changing all the information of each IAVO, and loading new sounds.

5. Reflections on the Interaction Design of *AV Clash*

In *AV Clash*, only the most relevant UI elements are visible at a given time. Since IAVOs contain a large amount of buttons and interactive elements, they are shown and hidden depending on the position of the mouse relative to the IAVO, and if the IAVO is playing or not. For example, rolling over the ring of a playing IAVO reveals the interactive possibilities contained in the ring, previously hidden (volume and effect fader thumbs, enlarged ring for drag-

ging and throwing). If the user moves the cursor further towards the inside of the ring, more interface options appear (playback and effects buttons). Donald Norman classifies this approach as modularization - creating separate functional modules, "each with a limited set of controls, each specialized for some different aspects of the task" [5, p. 174].

Visibility is important not only for modularity, but also to hide irrelevant options in a certain context. For example, if an IAVO is not playing, the volume and effect faders are hidden. As Donald Norman states, "a good designer makes sure that appropriate actions are perceptible and inappropriate ones invisible" [5, p. xii].

This hiding and showing of elements also indicates feedback, sending users "information about what action has actually been done, what result has been accomplished" [5, p. 27]. Another example of this principle occurs when users press one of the playback selection buttons - the button becomes invisible.

The graphic design of interactive elements in *AV Clash* is meant to convey its functionality. An example of this approach is the design of the ring, which has a jagged appearance, meant to reflect its "draggable" affordance. According to Norman, affordances refer to "the perceived and actual properties of the thing, particularly those fundamental properties that determine just how the thing could possibly be used" [5, p. 9].

The notion of mapping, meaning the relationship between the controls and the results [5, p. 23], is also explored in *AV Clash*. An example of this is the mapping of each IAVO to a specific screen area in the beginning of the session, to which it returns to when users press the "back stage" option. Mappings are also implemented when a playback selection button expands to a full audio and visual loop selection interface - the audio and visual loop selection options are located in the same quadrant of the correspondent selection button.

Besides an emphasis on functionality, the UI of *AV Clash* also references its own aesthetic universe, connected to the circular nature of the animations. These animations, although abstract, are often inspired by concentric “real” objects such as flowers, planets, biological and molecular/atomic structures. The visual appeal of the UI is meant to induce playfulness: “the mouse and the penbased interface allow the user the immediacy of touching, dragging, and manipulating visually attractive interfaces” [1, p. 23].

6. Conclusions

6.1 Assessment Regarding Initial Aims

The author considers that *AV Clash* has fulfilled the objective of developing the structure behind *AVOL* into a more flexible project, in terms of source sounds (imported from Freesound.org), animations (although less diverse than the sounds) and audiovisual manipulation (through the implementation of sonic and visual effects). The introduction of the “throw” behavior and the development of the “clash” behavior contributed to a higher degree of playfulness. The use of colors and tags (imported from Freesound.org) to identify IAVOs also facilitates recognition of objects. The colored bars create a higher visual diversity on the stage. The “save set” functionality introduces an option to save all settings for all IAVOs, allowing for the storing and sharing of user options. Besides loading new sounds, the “load set” button can quickly change multiple parameters within a session.

However, several limitations have been identified by the author in the project, which should be addressed in a future project, or in a new version of *AV Clash*.

6.2 Paths for Future Developments

AV Clash could benefit from accessing more content, and from having more content manipulation capabilities.

The visual diversity of *AV Clash* is still small compared to its audio side. A database for visuals (possibly vector based animations) could be created, which would then be used by *AV Clash* similarly to Freesound.org for sound. Further audio and visual effects could be added. Specific tags for *AV Clash* could be created in Freesound.org to ensure coherence of results.

Recording capabilities could be built in *AV Clash*, in order to allow users to record their sessions. Content sharing could also be implemented, not only of sets but also of those recording sessions. This content sharing could also integrate with profiles of users in Freesound.org.

Collaboration functionalities could also be implemented. Users could be allowed to take control of a certain IAVO, and play with it. The different users would “jam” together, each with his/her own IAVO. This system would resemble how a band plays in a “real life” stage.

A “sequence” mode could be implemented in *AV Clash*, which would not simply playback one of the sounds of each IAVO, but instead run through the four sounds – in a linear sequence; randomly; or in another sequence defined by the user (for example, by drawing a path in the “back” of the object connecting the four sounds, thus specifying the order). This “sequence” mode is inspired by *Freesound Radio*.

6.3 Final Reflections

These conclusions are preliminary. *AV Clash* is under development, as mentioned before, and is being tested by Video Jack. Therefore it is not online yet, and no public presentations have been done. Video Jack intend to release *AV Clash* online soon, in July 2010. They wish to start presenting the project shortly after, as installation and performance. A domain name has been registered for the project.³ Currently it only displays a few preliminary recordings using a prototype version

³ <http://www.avclash.com>

of the project.

Feedback gathered from users after releasing *AV Clash*, and from presentations, will enrich the conclusions presented in this paper. The author intends to conduct interviews to users, to better assess these conclusions.

The author believes that there is a vast potential for the type of application that *AV Clash* represents – a playful tool for integrated audiovisual expression, which gathers audiovisual resources from Internet repositories, and that explores the potential of connecting users through the Web via their creativity.

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9 Article 5:

Master and Margarita – from Novel to Interactive Audiovisual Adaptation

Keywords
 new media
 animation
 “visual music”
 adaptation
 collage
 Mikhail Bulgakov
 Video Jack

Abstract

Master and Margarita is an audiovisual work by Portuguese new media art collective Video Jack that adapts Mikhail Bulgakov's Russian modernist novel. This article studies those aspects of intermediality that resulted from this particular adaptation. Video Jack's project, in contrast to other similar audiovisual artworks, does not aim to follow an abstract “visual music” aesthetics but rather takes an innovative narrative approach. Intermedial aspects bring into focus Video Jack's non-literal “borrowing” from the novel.

Introduction: Historical Precedents

This article aims to examine the issues of intermediality that are raised by adapting the novel form to a new medium. *Master and Margarita* is the title of an interactive audiovisual work inspired by the satirical novel of the same name by Mikhail Bulgakov. The adaptation of Bulgakov's *The Master and Margarita* was developed in 2009 by the Portuguese new media art collective, Video Jack. [1]

Video Jack's *Master and Margarita* can be contextualised with several

historical works of art which aimed to create integrated sound and image artworks, particularly by combining music with narrative structures and animation. In ancient Greece, philosophers such as Aristotle, Pythagoras and Plato speculated that there might be a correlation between the musical scale and colours (see Moritz 1997; Van Campen 2008: 45). The idea was further explored by such artists and scientists as Leonardo da Vinci and Isaac Newton (see Van Campen 2008: 45–46).

Richard Wagner idealised a type of artwork that would combine different forms of the arts in what he called a “total work of art” (*Gesamtkunstwerk*). Wagner's *Gesamtkunstwerk* is an operatic performance that encompasses music, theatre and the visual arts. As Wagner suggested in 1849: “The true drama is only conceivable as proceeding from a common urgency of every art towards the most direct appeal to a common public” (2001: 5). He concluded that, to achieve this, “each separate branch of art can only be fully attained by the reciprocal agreement and co-operation of all the branches in their common message” (2001: 5).

It was only with the emergence of

cinema that the combination of abstract animation and music was made possible, a mix often classified as “visual music,” such as in the work of Oskar Fischinger and Walther Ruttmann (see Moritz 1997). However, Fischinger preferred the abstract visualisation of music, having halted work on Disney's *Fantasia* after his designs “were simplified so that only one thing at a time moved, and everything was altered a bit to make it resemble some natural form, from a violin to a tin roof to a cloudy sky” (Moritz 2004: 84).

The development of electronic technologies in the twentieth century inspired many artists to pursue new means of synthesis in the arts. As Roy Ascott asserts, artists have been increasingly “bring[ing] together imaging, sound and text systems into interactive environments that exploit state-of-the-art hypermedia and that engage the full sensorium, albeit by digital means” (1990: 307). Ascott calls this convergence *Gesamtdatenwerk*, a concept inspired by Wagner's *Gesamtkunstwerk*.

As well, electronic music has played an important role in exploring the potential of digital art in the late twentieth/early twenty-first centuries. Christiane Paul has suggested that digital sound art and music projects are a vast territory that includes not only pure sonic art (without any visual component), but also audiovisual environments and Net art projects that allow for realtime compositions and remixes (see Paul 2003: 133). According to Paul, many of the projects within the audiovisual area follow the tradition of “kinetic light performance” or the visual music of Oskar Fischinger (Paul 2003: 133). However, narrative approaches to audiovisual projects, such as *Master and Margarita*, are less common. [2]

Bulgakov's *The Master and Margarita* has been adapted frequently, especially following the 1970s. His novel has lent itself to various different media forms, such as cinema, TV, theatre, opera and the graphic novel. One of the most interesting adaptations is

a TV mini-series released in Russia in 2005. It consists of 10 episodes, with a total duration of nearly nine hours. The director and screenwriter of this adaptation, Vladimir Bortko, decided to make a mini-series instead of a film in order to be faithful to the novel. As he states, “I didn't write one word of the screenplay from my own ideas [...] [i]t is Bulgakov's text” (qtd. in Sonne 2005). With this extended duration, he aimed to include the novel's psychological depth, as well as its supernatural side and humour. According to Bortko, it would be impossible to fit all the scenes from the novel into a film.

Andrzej Klimowski's and Danusia Schejbal's graphic novel adaptation of *The Master and Margarita*, published in 2008, elaborates the narrative elements based in Moscow with pen-and-ink and watercolour created by Klimowski, with the biblical sections done in colour gouache by Schejbal. Their graphic novel does not attempt to be a full adaptation of Bulgakov's work. According to Neel Mukherjee, it is a simplified and “flattened” version (Mukherjee 2008).

***Master and Margarita*—the Adaptation and its Aesthetics**

Master and Margarita is not a literal adaptation of Mikhail Bulgakov's (1891–1940) novel *The Master and Margarita*, which was first published in 1966. [3] The novel has three main sub-plots. The first plot presents the Devil and his entourage creating havoc in the Moscow of the 1930s. In the second plot, Margarita strikes a Faustian deal with the Devil in order to be reunited with her lover, a tormented writer whom she calls Master. In Bulgakov's narrative, there is also the story of Matthew the Evangelist in Jerusalem in 33 AD attempting to uncover the truth about Pontius Pilate and the crucifixion of Jesus. Bulgakov progressively integrates these threads while, as Paul Sonne puts it, “exercising devilish lampoonery and wit to satirize Soviet life under Stalin” (Sonne 2005). Each of the three sub-plots provides a com-

mentary on the others (see Milne 1998: 202). The tale of the Master mirrors the life of Bulgakov in certain aspects, as in the references to publishing problems and censorship. As Lesley Milne asserts, *The Master and Margarita* is a book that tells the tale of its own composition (1998: 202).

In Video Jack's *Master and Margarita*, the biblical story was omitted. It would have been considerably difficult to integrate the subplot with Matthew the Evangelist, due to its long dialogues and slow pace, in a non-verbal adaptation. Also, it would not have suited the animation style of Video Jack, which focuses more on the action-driven chapters of the book. Nine chapters were chosen for the adaptation, allowing for an overview of this complex narrative and including most of the main events and characters, with the exception of those in the biblical part.

Using Dudley Andrew's terminology, I would suggest that *Master and Margarita* is a "borrowing" type of adaptation, in which "the artist employs, more or less extensively, the material, idea, or form of an earlier" work (1984: 98). In these types of adaptation, the audience "is expected to enjoy basking in a certain pre-established presence and to call up new or especially powerful aspects of a cherished work" (Andrew 1984: 98).

Stylistically, *Master and Margarita* can be understood as an audiovisual "collage" inspired by Bulgakov's book. Collage is an artistic technique invented by Georges Braque and Pablo Picasso, who reassessed painting and sculpture, giving each medium some of the characteristics of the other. Braque and Picasso placed great value on everyday materials and objects. The Futurists and the Dadaists also employed collage, as did painters in the Russian avantgarde. The latter used photomontage, an extension of collage, to support their ideals of a progressive world order (see Waldman, n.d.). Collage is, therefore, a key concept behind this adaptation of Bulgakov's novel to the interactive audio-

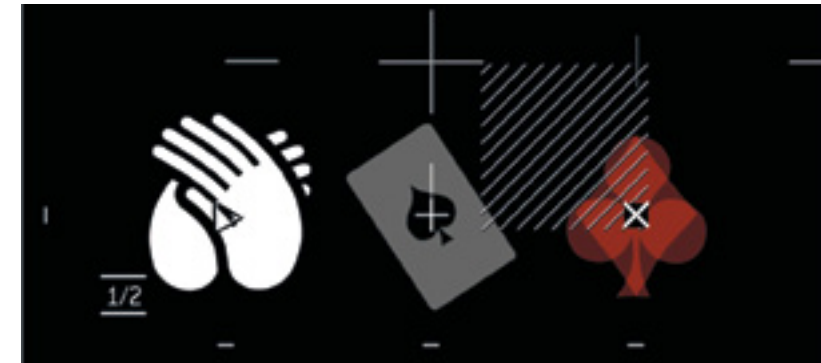
visual project. This collage aesthetic is applied using multiple techniques. Visually, photographs and other found or non-drawn elements (such as blots of ink) are mixed with 2D and 3D animation. These techniques aim to match Bulgakov's literary approach, its rawness and mixture of elements—his "dazzling display of different styles, from the austere laconic to the richly ornamented" (Milne 1998: 203). Moreover, the adaptation serves as a visual reference to such avant-garde artists contemporary with Bulgakov as Alexander Rodchenko and El Lissitzky. Similar to Video Jack in their *Master and Margarita*, Rodchenko and El Lissitzky also combine different modalities of visual communication in their works, such as simple but expressive geometric shapes, together with symbolic elements, lettering and photographs.

Sonically, the collage is achieved by mixing different types of sound: field recordings of sounds related to the narrative, and samples of music related to the themes of the book, as well as to the collage aesthetics; electronic percussion and synthesizer sounds were also added. A saturated and multilayered work is created that captures Bulgakov's surreal, almost demented, universe, creating an engaging multisensorial experience.

Master and Margarita borrows the idea of different narrative levels commenting on each other from Bulgakov's novel, and expands it to the visual and sonic layers. The visual elements comment on the narrative, bringing different levels of realism and symbolism into play, from the realistic fullscreen animations to the animated icons. The sound elements also provide commentary on the narrative, mainly through the use of field recordings. These different layers—in both sonic and visual spheres—echo the multilayered writing style of Bulgakov. Like Bulgakov's novel, *Master and Margarita* emphasises the process involved in making a work of art. Whereas in the novel Bulgakov comments upon the act of writing and brings up parallels

between his life and the character of the Master, *Master and Margarita* displays the user interface and the user's actions. Similarly to the book, in which references to the writing of the novel are apparent, in the interactive audiovisual project, the activity of choosing the different chapters, animations and sounds is equally relevant.

The animations in *Master and Margarita* are divided into four main areas that correspond to the position of the



buttons that trigger them: top animations, lower animations and lateral animations. [4] Top animations mainly include characters or major narrative elements. They involve action, and contribute to the narrative. These animations fill the entire screen. Lateral animations are also fullscreen animations; however, they essentially contain background elements or graphic details. [5]

"Animated icons," or the animations in the lower part of the visual field, are iconographic elements that symbolise concepts or represent a certain narrative element. [6] They can be dragged and placed on different areas on the screen. Animated icons can also trigger sounds, if the triangular "play" button in the centre is pressed. Once playing, volume and size can be controlled by additional user interface elements. When the respective sound is playing, the animated icons are sound-reactive—their size changes according to the amplitude of the sound (see Fig. 1).

The sound in each *Master and Margarita* chapter consists of four sound loops—sounds with a duration of 14 seconds that cycle seamlessly. Both the sounds and the animations of *Master and Margarita* follow this "loop" logic. Once activated, and without further intervention, they would run indefinitely, repeating without a perceptible beginning or end.

Fig. 1: Stopped, active and manipulated animated icons.

Intermedial Borrowings

In order to discuss in detail how the adaptation from Bulgakov's novel to Video Jack's interactive audiovisual project was accomplished, it is necessary to recall those nine chapters of Bulgakov's novel that were adapted for this project. In the chapters "Never Talk to Strangers" and "The Seventh Proof," Bulgakov introduces the character of Woland, a devil who goes to Moscow and engages in a theological discussion about the existence of Jesus Christ with two members of the local literary elite. Woland predicts the imminent death of one of his interlocutors; his prediction comes true shortly after. In the chapter "Black Magic and Its Exposure" (adapted in two parts), Woland and his associates, including the man-cat Behemoth and the choir master Koroviev, stage a magical and mystical show in Moscow. The main show, which is preceded by the perfor-

mance of the Giulli family of acrobats, defies the audience's expectations, and exposes not the black magic as was announced, but the greed and corruption of the audience. A later chapter, "The Hero Enters," tells the love story of the Master and Margarita, from their meeting to their separation, narrated by the Master to Ivan Homeless while they are both at a mental health institution. Besides the romance aspect, the chapter also focuses on the Master's struggle to get his novel published, which culminates in frustration. In the subsequent chapters, "Azazello's Cream" and "Flight," Margarita strikes a deal with the Devil in order to find her lost lover, and to avenge him, gaining supernatural powers in the process. Eventually, in the chapter "The Great Ball at Satan's," Margarita fulfils her part of the deal with Woland, becoming his companion at an extravagant and surreal ball. The chapter "The End of Apartment No. 50" depicts the local police attacking the apartment where Woland and his partners were hosted, following the chaos caused by the group in Moscow. Finally, the chapter entitled "It's Time, It's Time" brings the novel to a close, with the death of the Master and Margarita, and the departure of their "ghosts" (the book is very ambiguous here) from Moscow together with Woland and the rest of his entourage. In the following, I want to show in detail, through an analysis of three selected chapters from the project, how the adaptation from the novel to an interactive audiovisual project was created.

"The Seventh Proof"

The top animations, which are inspired by the third chapter of Bulgakov's novel, "The Seventh Proof," convey the main narrative elements of that chapter. They follow a colour scheme that is red, white and black, similar to the graphics of Rodchenko and El Lissitzki. As in the works of these two artists, photomontage is heavily used in the animations, together with graphic elements. Elements from the novel's

first chapter, "Never Talk to Strangers," also appear.

In the animations, red symbolises both the blood that will eventually be spilled and also, as the first sentence of the book thematises, the sunset: "At the hour of the hot spring sunset, two citizens appeared at the Patriarch's Ponds" (Bulgakov 2006: 3). Red is also, of course, associated with the flag of the USSR and Red Square.



Fig. 2: Berlioz in "The Seventh Proof."

One of the animations depicts swans in the Patriarch's Ponds, where the action of these two chapters takes place. Another animation presents the character of the literary critic Berlioz:

One of them, approximately forty years old, dressed in a grey summer suit, was short, darkhaired, plump, bald, and carried his respectable fedora hat in his hand. His neatly shaved face was adorned with black horn-rimmed glasses of a supernatural size. (Bulgakov 2006: 3)

In the animation, photographs of a mouth and eyes are combined with drawn elements of a face and suit (see Fig. 2). The animation reflects Berlioz's difficulty in breathing "at that hour when it seemed no longer possible to breathe" (Bulgakov 2006: 3), and his inner state of anxiety: "[H]is heart gave a thump and dropped away somewhere for an instant, then came back, but with a blunt needle lodged in



Fig. 3: Woland in "The Seventh Proof."

it" (Bulgakov 2006: 4). The heart is depicted quite literally in the animation.

An additional animation presents Woland, the enigmatic foreigner. Again, photographic elements in the face are mixed with drawn ones. Woland's depiction is faithful to Bulgakov's description in the book:

He was wearing an expensive grey suit and imported shoes of a matching colour. His grey beret was cocked rakishly over one ear; under his arm he carried a stick with a black knob shaped like a poodle's head. He looked to be a little over forty. Mouth somehow twisted [...] Right eye black, left—for some reason—green. Dark eyebrows, but one higher than the other. (Bulgakov 2006: 7–8)

The detail of the poodle-shaped knob on Woland's walking stick is highlighted in the second part of the animation, where Berlioz, who "sat down on a bench" (Bulgakov 2006: 4), looks curiously at the foreigner. The bubbles surrounding Woland convey the aura of mystery and magic around the character (see Fig. 3). Another animation introduces the tram car, which will eventually run over Berlioz and cut off his head: "And right then this tram car came racing along" (Bulgakov 2006: 59).

Additional animation depicts the multiple instances of Woland, reflecting his contradictory shifts in mood, his progressively more threatening

presence and his apparent insanity: "Here the insane man burst into such a laughter [...]" (Bulgakov 2006: 57). A low-angle perspective represents this oppressiveness. Finally, the concluding animation shows Berlioz's head rolling on the screen, leaving a trace of blood behind as a result of being run over by the tram, although the actual accident is not shown in the animation, but only hinted at:

The tram-car went over Berlioz, and a round dark object was thrown up the cobbled slope below the fence of the Patriarch's walk. Having rolled back down this slope, it went bouncing along the cobblestones of the street. It was the severed head of Berlioz. (Bulgakov 2006: 60)

The lateral animations depict the vegetation of Patriarch's Ponds that act as a background for the action (although in this case the "background" often becomes the foreground: It can appear on top in the top animations). The last animation is an exception: A jet of blood conveys the violent ending to the chapter.

The animated icons complete the visual interpretation of the chapter. One represents the traffic light which warns Berlioz of the oncoming tram: "He turned [...] and was just about to step across the rails when a red and white light splashed in his face. A sign lit up in a glass box: 'Caution! Tram-Car!'" (Bulgakov 2006: 59). Another animation represents the blood and violence, present across all layers of animation (top, lateral and lower). An additional animated icon represents the religious discussion surrounding the existence of Jesus: "Bear in mind that Jesus did exist" (Bulgakov 2006: 19). The last animated icon is more ambiguous, and brings to mind both a target and the wheels of the oncoming tram.

The music points implicitly to the anxiety, madness, oppression and emotional confusion depicted. One loop portrays rather clearly one of the narrative elements—the motion of an oncoming tram. The music helps to

complete the “picture,” contributing to the psychological and emotional elements and to the atmosphere of confusion that prevails in this chapter.

While some details from the book become amplified in the visual interpretation (for example, the poodle-head knob), other elements disappear. The characters of Ivan Homeless and Azazello, for example, are referred to but do not appear as such. References to the religious sub-plot are omitted, with the exception of an animation with a symbolic cross. The commentary on the Moscow literary scene is also left out. However, the chapter’s two crucial elements are represented: the introduction of Woland and the death of Berlioz. More importantly, the dense atmosphere of the chapter is captured with images and sounds. There is a magnification of certain elements of the book, on the one hand, and a simplification, on the other. To a degree, it can be said of Video Jack’s *Master and Margarita* as a whole that it foregrounds certain literary aspects while simplifying other parts of the novel.

“Black Magic and Its Exposure”

The animations and sounds that form the interpretation of Chapter 12, “Black Magic and Its Exposure,” are divided into two parts. In both parts, a different colour palette is used than the one in “The Seventh Proof.” In addition to red, white and black, there is extensive use of the colour blue. The chromatic references to the Soviet flag, Constructivism and blood depicted in “The Seventh Proof” are extended to the present-day Russian flag. Red, white and blue are also the colours of the flags of the U.S., the U.K. and France; the project therefore makes an implicit critical connection between the Soviet era and contemporary society.

In Part One, the top animations refer mainly to the Giulli family of acrobats, the “warm up” performers who precede the main attraction of the night, Woland and his troupe. In contrast to the previously discussed chapter, which made more use of small de-

tails and backgrounds, in this chapter, the graphic style changes to a more minimalistic look in which photomontage is still combined with drawings, but the illustrations are sketches rather than detailed graphics.

One of the animation portraits is of “a small man in a yellow bowler hat full of holes and with a pear-shaped, raspberry-coloured nose, in checkered trousers and patent-leather shoes, rolled out on to the stage of the Variety on an ordinary two-wheeled bicycle” (Bulgakov 2006: 163). The animation shows him losing one wheel of the bicycle; as described in the book, the man “contrived while in motion to unscrew the front wheel and send it backstage, and then proceeded on his way with one wheel” (Bulgakov 2006: 163).

Another animation depicts the Giulli woman: “On a tall metal pole with a seat at the top and a single wheel, a plump blonde rolled out in tights and a little skirt strewn with silver stars, and began riding in a circle” (Bulgakov 2006: 163). The woman’s short skirt is merely suggested by a few grey strokes. An additional animation presents the child performer: “[F]inally, a little eight-year-old with an elderly face came rolling out and began scooting about among the adults on a tiny two-wheeler furnished with an enormous automobile horn” (Bulgakov 2006: 163). The detail of the horn is amplified in the animation.

Fig. 4: Bengalsky in “Black Magic and Its Exposure.”



The next animation introduces Bengalsky (Fig. 4), the master of ceremonies, one of the main characters in this chapter. In the background, the curtain and its reddish glow are depicted as suggested by their description in the book:

A moment later the spheres went out in the theatre, the footlights blazed up, lending a reddish glow to the base of the curtain, and in the lighted gap of the curtain there appeared before the public a plump man, merry as a baby, with a clean-shaven face, in a rumpled tailcoat and none-too-fresh shirt. This was the master of ceremonies, well known to all Moscow—Georges Bengalsky. (Bulgakov 2006: 167)

The last top animation showcases the audience, and their excited response to the first spectacles of the main attractions of the night (which will be further developed in Part Two): “[R]apturous shouts came from the wings” (Bulgakov 2006: 170).

One of the animated icons also focuses on the audience response. Stylised clapping hands mimic the “unbelievable applause” (Bulgakov 2006: 170) from the public. Two other animated icons refer to the card tricks that will also appear later in Part Two, as well as to the notions of gambling and “easy money.” The last animation represents a flash, which will be occurring later in the chapter as well, quite literally: “[T]he pistol was pointed up [...] there was a flash, a bang” (Bulgakov 2006: 171). The flash also relates to the theatre lights.

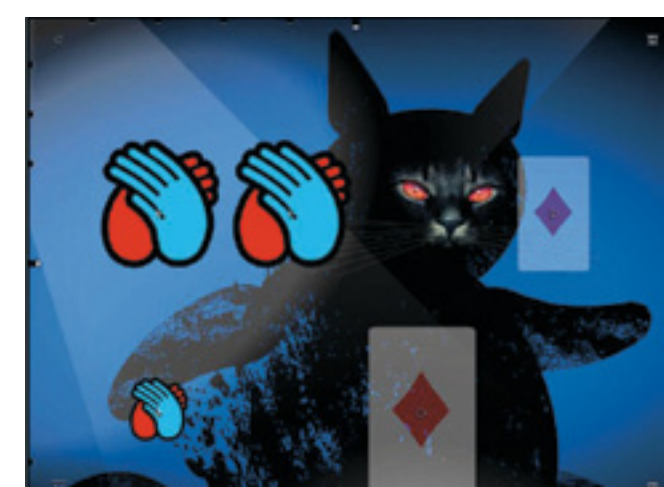
The lighting in the theatre is further presented in one of the lateral animations. A bicycle wheel is represented in another, a reference to the Giulli family. The deconstructed, only partially dressed, female bodies in two of the animations point towards the fashion extravaganza in the second part of the chapter, when the “women disappeared behind the curtains, leaving their dresses there and coming out in new ones” (Bulgakov 2006: 178).

Sounds recreate the vaudeville at-

mosphere of the chapter. One of the sound loops represents the “alarming drum-beats of the orchestra” (Bulgakov 2006: 163). The sound of the orchestra has a tribal, pagan character in tune with the “black magic” theme. Another conveys the sounds of the audience—“there were gasps of ‘ah, ah!’ and merry laughter” (Bulgakov 2006: 171)—as well as clapping and feminine agitation: “[F]rom all sides women marched on to the stage [...] general agitation of talk, chuckles and gasps” (Bulgakov 2006: 178). An additional sound is a piano melody, somehow naive, delicate and feminine, conveying the seductive appeal of the visions conjured by Woland. The remaining sound loop is more mysterious and ethereal, suggesting the magical atmosphere.

The top animations in the second part of “Black Magic and its Exposure” represent the characters of Behemoth, the devilish cat with semi-human behaviour, and the choir master Koroviev (also known as Fagot, which is Russian for “bassoon”); these animations all refer to Bulgakov’s description in the novel: “but most remarkable of all were the black magician’s two companions: a long checkered fellow with a cracked pincenez, and a fat black cat who came into the dressing room on his hind legs” (Bulgakov 2006: 165).

Fig. 5: Behemoth in “Black Magic and Its Exposure.”



One of the animations shows Behemoth simply walking onto stage, with ink blots jumping out of his body. His red eyes betray his demonic nature (see Fig. 5). Two other animations represent the card trick performance by Behemoth and Koroviev/Fagot, which Bulgakov describes as follows:

Fagot and the cat walked along the footlights to opposite sides of the stage. Fagot snapped his fingers, and with a rolling “Three, four!” snatched a deck of cards from the air, shuffled it, and sent it in a long ribbon to the cat. The cat intercepted it and sent it back. [...] Fagot opened his mouth like a nestling and swallowed it all card by card. (Bulgakov 2006: 169–170)

In the animation, Koroviev is also depicted with devilish red eyes, but the cards are merely suggested, as outlines. The animated icons complete the picture, providing a more literal representation of playing cards.

The last top animation shows Behemoth cutting off Bengalsky’s head, and putting it back again, as described in the book. First, the head is removed: “Growling, the cat sank his plump paws into the skimpy chevelure of the master of ceremonies and in two twists tore the head from the thick neck with a savage howl [...] blood spurted in fountains from the torn neck arteries” (Bulgakov 2006: 173), and then it is put back: “The cat, aiming accurately, planted the head on the neck, and it sat exactly in its place, as if it had never gone anywhere” (Bulgakov 2006: 174). Although in the book these two events are not presented as a continuous action (there is a discussion with the audience in between), in the animation it becomes a repeating loop, and Bengalsky is (appropriately) no longer smiling.

The lateral animations repeat motifs from the first part of this chapter and from “The Seventh Proof” which include the spotlight, curtains and blood, although differently coloured than those earlier animations. Two of the animated icons contain the U.S.

dollar and euro symbols, surrounded by moving circles. They represent the greed and consumerism of the audience members, and also the money that literally falls upon them: “[I]n a few seconds, the rain of money, ever thickening, reached the seats, and the spectators began snatching at it” (Bulgakov 2006: 171).

Regarding sound, one of the loops continues the tribal, ritualistic percussive sound of Part One with added aggressiveness, mirroring the sounds of the orchestra in the theatre: “[T]he orchestra ... hacked out some incredible march of an unheard-of brashness” (Bulgakov 2006: 182). In another sound, distorted noises from present-day slot machines can be discerned, representing the “easy money” and gambling theme of the chapter. An additional sound is a distorted and harsh synthetic melody, representing the violent and bloody aspect of the text. The last sound is a recording of sheep, illustrating the notion of materialistic “herd behaviour” demonstrated by the fervent race towards money and luxury goods offered by Woland and his accomplices.

The music in both parts of this chapter is particularly ironic, fitting the tone of Bulgakov’s cartoon-like descriptions of the black magic “séance.” The animations cover most of the action, either in a more literal way or by suggestion—with the exception of the dialogues established between characters. [7] These are difficult to convey using the style of animation adopted for the project. The money magic trick and women’s fashion extravaganza are only suggested by more symbolic animations. Woland, a less important character in this chapter, does not appear in the animations here, and Behemoth, assisted by Koroviev, becomes the main character instead. Because of its division in two parts, and consequently having twice the number of animations and sounds, this is one of the most comprehensively adapted chapters of Bulgakov’s novel within the Video Jack project.

“The Hero Enters”

This chapter is quite different in tone from the previous ones. It narrates how the Master met Margarita, his lover. The tone is not violent, ironic or fantastic, as in the previous chapters, but romantic and poetic. The colour scheme becomes softer, with different shades of blue mixed with black and white. The Master narrates this story from a psychiatric hospital, and he appears in the top animations as both narrator and character. As narrator (see Fig. 6), he appears dressed in a hospital gown, although his gown is blue in the animations (and not brown as in the book) in order to fit with the overall colour scheme: “Here Ivan saw that the man was dressed as a patient. He was wearing long underwear, slippers on his bare feet and a brown dressing-gown thrown over his shoulders” (Bulgakov 2006: 183). The Master’s face looks weary and exhausted, reflecting the suffering he has been through.

This chapter also contains fewer animations than the others. In one of the top animations, the Master sees Margarita pass by in a Moscow street, carrying yellow flowers: “[S]he was carrying repulsive, alarmingly yellow flowers in her hand [...] and these flowers stood out clearly against her black spring coat” (Bulgakov 2006: 192). Margarita looks distant and sad: “I can assure you that she saw me alone, and she looked at me not really alarmed, but even as in pain. And I was struck not so much by her beauty as by an extraordinary loneliness in her eyes” (Bulgakov 2006: 192–193).

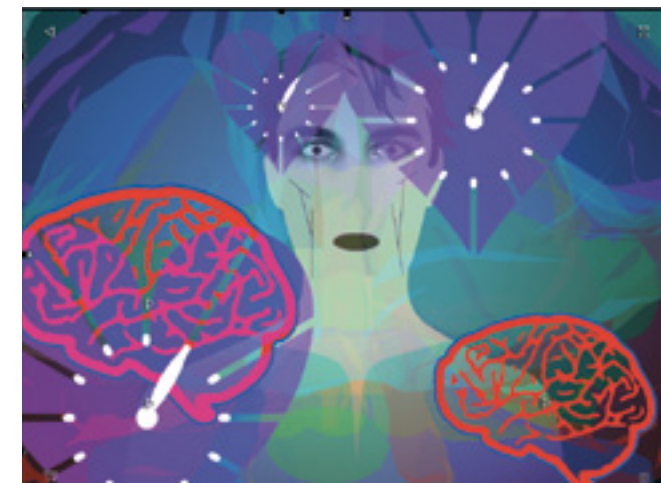
The other top animation depicts the Master’s anxiety as he awaited Margarita’s visits to his basement apartment: “[M]y heart would pound no less than ten times before that”; and “when her hour came and the hands showed noon, it wouldn’t even stop pounding until [...] her shoes would come even with my window” (Bulgakov 2006: 195). The second half of this animation shows Margarita’s steps coming towards the Master, from the perspective of his window.



Fig. 6: The Master and Margarita in “The Hero Enters.”

The Master’s anxiety regarding the time of the meeting with his beloved is also reflected, albeit in a more iconographic way, by one of the animated icons, i.e., a heart-shaped clock, beating fast. An additional animation represents both the Master’s brain (literally) and his creativity (figuratively, via a light bulb). This has a double connotation—indicating his feverishly creative period in the basement in the past, and his affected sanity at the madhouse in the present (see Fig. 7). Another animation is more symbolic, a flash, conveying the effect of love upon the couple: “[L]ove leaped out in front of us like a murderer in an alley leaping out of nowhere, and struck us both at once” (Bulgakov 2006: 194). One last animation, a snow crystal, relates to the Master’s winter period of loneliness before meeting Margarita: “[I]n the winter it was very seldom that I saw someone’s black feet through my window and heard the snow crunching under them” (Bulgakov 2006: 191).

Fig. 7: Mental states of the Master in “The Hero Enters.”



The same image of winter is conveyed by the snow in one of the lateral animations. Another one shows a multitude of passers-by: “[B]efore my meeting with her, few people came to our yard—more simply, no one came—but now it seemed to me that the whole city came flocking here” (Bulgakov 2006: 195). One more animation again depicts the Master’s brain, although here the speed of the moving brain and the strong colours convey a sense of dementia. The last animation, a flower, recalls the moment of the first encounter between the Master and Margarita.

One of the sound loops, an unsteady beat, represents a broken mechanism, a clock moving at an irregular speed. Another sound is a recording of bells, illustrating the passage of time. The two remaining sound loops are more musical and melodic, conveying romance, although the melody is bittersweet and melancholic, reflecting the longing for an absent lover.

The first part of the chapter, the dialogue between Ivan Homeless and the Master, is not adapted, since the adaptation focuses on the Master’s recollections of his love story with Margarita. Some elements from the novel are omitted, particularly those related to the activity of writing the book, the problems surrounding its publication, the burning of the manuscript, and even several locations such as the apartment and the streets. But the first meeting of the couple, the city atmosphere, the romantic mood and the anxiety of the Master while waiting for his next meeting with Margarita are well conveyed by the animations and music. This is a chapter in which the elements are suggested rather than presented directly, which matches the fragmented poetic recollections expressed by the Master in the novel.

Conclusion

In this article, I have tried to show that Video Jack’s *Master and Margarita* is not strictly an adaptation of Bulgakov’s novel, but a work inspired by it and from which it “borrows” key elements

(to use Andrew’s terminology [Andrew 1984]). As in Klimowski and Schejbal’s graphic novel *The Master and Margarita*, Video Jack’s interactive audiovisual project simplifies Bulgakov’s book. Some elements from the novel have been left out and others such as the political and social elements are only suggested by the music, whereas the religious elements are suggested by means of a few animated icons. Still, those who have read the novel will recognise the main characters and events, particularly the devilish incursion in Moscow, the love story between the Master and Margarita, and Margarita’s Faustian transformation. To those who have not, *Master and Margarita* could serve as an introduction to the book, enticing them to read the novel.

Nevertheless, even if *Master and Margarita* is not a full adaptation of the letter of the novel, it aims to be true to its spirit—its irreverence, intensity, stylistic diversity, irony and use of multiple layers of meaning. It conveys the particular artistic vision of its creators and therefore it is not only an interpretation of Bulgakov’s work, but also an autonomous and coherent work of its own. The approach taken to the integration of sound, animation and graphic user interface establishes a clear connection with the authors of the project and their previous works. [8] Additionally, new meaning is contributed to the novel, such as the animations and sonic elements, which comment on twenty-first century society.

What remains in the conversion are these elements: the contrasting violent and romantic aspects of the novel; the supernatural and magical elements; the emotional tension; the wit; the multiplicity of layers; the stylisation of expression and the openness to interpretation of the work. Both *Master and Margarita* and the novel it adapts are “written in code”; they have elements that require decoding in order for the full meaning to emerge. In the novel, the coded elements pertain particularly to the political dimension. In the adaptation, many elements of the book (mainly narrative but also emo-

tional) are symbolised in iconic animations and sounds, and the user/viewer/listener is expected to create meaning by connecting these different elements. All these aspects contribute to the meaning: the sounds and animated icons, together with the more literal animations—the distinct branches of art combine in a “common message,” in “reciprocal agreement and cooperation,” as Wagner stated in his description of the ideal *Gesamtkunstwerk* (2001: 5). Therefore, while *Master and Margarita* simplifies Bulgakov’s literary work, it also expands upon it, by opening the potential to generate new meaning, and an engaging experience, by means of an interactive multi-sensory approach.

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Video of performance version: <http://www.masterandmargarita.eu/en/05media/videojack.html>

[1] Video Jack is composed of André Carrilho and Nuno N. Correia. The Internet art version of the project, which can be found at

<http://www.videojackstudios.com/masterandmargarita>, is described in this article. A performance version was also created by Video Jack.

[2] A closer precedent would be a previous Video Jack work, *Heat Seeker*, available at:

<http://www.videojackstudios.com/heatseeker/>. As in *Master and Margarita*, *Heat Seeker* also combines (mostly) narrative animations with music (Correia 2010). In the case of *Heat Seeker*, however, the different narratives that compose the project are unrelated, and are not adapted from any previous work.

[3] The novel was written between the late 1920s and Bulgakov's death in 1940, and only published for the first time in 1966, a quarter century later.

[4] In each chapter, the number of top and lateral animations vary but there are always four animated icons, or lower animations.

[5] They often include abundant empty space, allowing the graphic elements underneath to show through (top animation or colored background). When characters are included in lateral animations, they are represented in a less realistic way than in top animations. Lateral animations are descriptive and contextualising rather than action-oriented.

[6] Their default size is smaller than that of the other animations. They are positioned on top of the remaining animations (top and lateral animations).

[7] For example, the dialogue between Koroviev and Arkady Appolonovich, chairman of the Acoustic Commission of Moscow Theatres, is left out.

[8] The connection to the earlier Video Jack project *Heat Seeker* is particularly evident.

10 Article 6:

AV Clash, Online Audiovisual Project: a Case Study of Evaluation in New Media Art

Keywords

Evaluation
new media art
net art
multisensorial
multimedia
audiovisual
aesthetic interaction user experience
usability.

Abstract

This paper presents an evaluation of new media art project *AV Clash*. *AV Clash* is a Web-based artistic project that allows the creation of audiovisual compositions, consisting of combinations of animations with sounds retrieved from online database Freesound.org. The evaluation is based on the answers to an online questionnaire. It has an experience focus, while also taking into account usability aspects. The questionnaire was structured following five main areas: sound, visuals and multisensoriality; amount and customization of content; flexibility of manipulation; usability and interactivity; creativity, playfulness and engagement. The concept of aesthetic interaction, relevant to the project and its evaluation, is presented. The results of the questionnaire are then discussed, followed by a reflection on the methodology used. Conclusions are reached regarding the five different areas of the questionnaire, and the adequacy of its experience focus. Usability problems are also identified and discussed. Finally, paths for further work are outlined.

Categories and Subject Descriptors

H.5.m [Information interfaces and presentation]: Miscellaneous; J.5 [Arts and humanities]: Fine arts.

General Terms

Design, Experimentation, Human Factors.

1. Introduction

AV Clash (<http://www.avclash.com>) is a Web-based artistic project by Video Jack (the author and André Carrilho, with the assistance of Gokce Taskan) that allows the creation of audiovisual compositions, consisting of combinations of sound and animation loops (Figure 1). The sounds in *AV Clash* are retrieved from Freesound.org (<http://www.freesound.org>), an online sound database. These sounds are grouped around four “objects”, each symbolizing a tag from Freesound.org (for example, “voice” or “drum”). These “objects” also incorporate visuals and graphical user interface elements, therefore they are entitled IAVOs (Interactive AudioVisual Objects).



Figure 1. Screenshot from *AV Clash*

More than 200 sounds are available in *AV Clash*: approximately 20 sounds per tag, from a total of 12 Freesound.org tags. Video Jack created eight animations per tag, consisting of subjective interpretations of the character of a given tag. The animations are audio-reactive. Users can change the tag of each IAVO, as well as the sounds and animations it contains. Numerous combinations of sounds and visuals are therefore possible. Users can additionally control volume, trim each sound, cycle between sounds, and add sound effects (“echo” and “filter”). IAVOs can be dragged and thrown, originating collisions between different objects, which trigger special sounds and animations. Sounds can be added to the project via Freesound.org, using the tag “avclash”. Some of the more advanced features and additional content are only available in a settings section, to avoid excessive complexity of the main interface, where only four sounds and animations are available per IAVO. An “infotip” gives users information about the most important interface elements (Figure 2).

AV Clash builds upon a previous project by Video Jack, *AVOL* (<http://www.videojackstudios.com/avol/>), released in 2007, and can be contextualized with other projects exploring integrated audiovisual expression, from pioneers such as Oscar Fischinger and John Whitney to more recent works such as Golan Levin’s *Audiovisual Environment Suite* and Toshio Iwai’s *Electroplankton* [1].

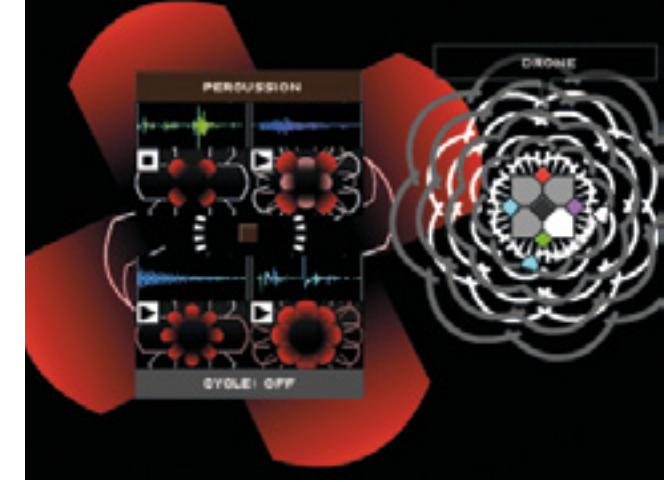


Figure 2. Detail of two IAVOs (left one in “settings” mode)

A prototype of the project was presented at the Sound and Music Computing conference in July 2010 [1], and the final project was released online in November 2010. Between prototype and final release, the project was optimized in terms of performance, usability, and connection to Freesound.org, based on feedback gathered at the Sound and Music Computing conference. In the nine months since its launch, the project has received more than 18000 visits. Soon after the project was released, an evaluation of the project was planned, based on an online questionnaire.

2. Methodology and Framework

An online questionnaire seemed to be an adequate format for evaluation, given that the project is Web-based, and the audience of the project is global. The questionnaire was designed in order to assess if *AV Clash* fulfills its objectives, as defined in the research question it addresses: how to create a tool for integrated audiovisual creativity, with customizable content, that is flexible, intuitive, playful to use and engaging to observe?

2.1 User Studies and New Media Art

To address the issues of creativity, playfulness and experience, and also the overall idea of engagement, recent texts regarding experience-focused approaches to human-computer interaction were important references.

The notion of aesthetic interaction also influenced the design of the questionnaire. Different authors have identified gaps between human-computer interaction (HCI) methodologies and the methodologies used by new media artists. These authors suggest that on the one hand, new media artists have ignored user studies; on the other hand, HCI methodologies are often task-focused, and not experience-focused, which artists would find more useful.

Höök et al. identified a tendency in interactive art to ignore HCI methodologies for interaction, “based on a mostly unstated belief that they do not measure aspects of interactive artworks that are of interest to artists” ([3], p. 241). Höök et al. consider that user studies can help artists “that want to express themselves through an interactive system” to make the interaction “work as intended” ([3], p. 248). Kaye et al. assert that while in a task-based approach there are “various metrics that are comparatively easy to evaluate”, in experience-focused applications (such as in new media arts) “to evaluate merely on usability is to miss the very point of these technologies” ([4], p. 2118). As a consequence, the field of HCI has been developing the concept of experience-focused HCI, “recognizing a widening of the sphere of HCI out of the workplace and into the world, and emphasizing the importance of culture, emotion, and lived experience” ([4], p. 2118).

Peterson et al. propose the notion of aesthetic interaction as an “extended expressiveness toward interactive systems”, emerging from the need of something “beyond ideals of efficiency and transparency, e.g. like considering the emotions, attraction, and affect invoked by design” ([9], p. 269), influenced by the pragmatist aesthetics views of Shusterman [10]. According to Peterson et al., pragmatist aesthetics is a particularly adequate perspective for designing interactive systems because “the legitimacy of the experience of the system is not confined to be in line with the intentions of the

designer of the system” but comes out of “the personal and interpersonal sensations, experiences and reflections” ([9], p. 271). Applying these views, “designing for aesthetic experiences invites people to actively participate in creating sense and meaning” ([9], p. 271). Peterson et al. state that aesthetic interaction is not “about conveying meaning and direction through uniform models; it is about triggering imagination, it is thought-provoking” ([9], p. 271). It is focused on “intriguing and sometimes even ambiguous aspects”, and its aims are to “encourage the user to explore and playfully appropriate the system”, by “creating involvement, experience, surprise and serendipity in interaction” ([9], p. 274). In other words, aesthetic interaction promotes “curiosity, engagement and imagination in the exploration of an interactive system” ([9], p. 275).

Also influenced by Shusterman, and additionally by the writings of Dewey [2], McCarthy and Wright discuss the related notion of aesthetic experience, in which “the lively integration of means and ends, meaning and movement, involving all our sensory and intellectual faculties is emotionally satisfying and fulfilling” ([7], p. 58). Each single act “relates meaningfully to the total action and is felt by the experiencer to have a unity or a wholeness that is fulfilling” ([7], p. 58).

In the present questionnaire, experience-related inquiry takes prevalence over usability, although usability aspects are also taken into account—as Höök et al. state, these aspects are relevant in new media arts in order to assess if the interaction works as intended. Additionally, as Kaye et al. assert, even experience-intensive technologies “may require careful testing and evaluation to eliminate usability problems” ([4], p. 2118). The concepts of aesthetic interaction and aesthetic experience were particularly relevant for the questionnaire, since they touch upon the issues of creativity, exploration, experience and playfulness.

2.2 Design and Launch of the Questionnaire

The different topics contained in the research question structured the sections of the questionnaire: integration of sound and visuals; amount and customization of content; flexibility of manipulation; usability and interactivity; creativity, playfulness and engagement. With the exception of creativity/playfulness, these elements can be mapped to Lev Manovich’s key concepts in new media studies ([6], p. 11): “what is new media?”; “the interface”; “the operations”; “the illusions”; and “the forms”. The integration of audio and visuals relate to the idea of “illusions”, with the design of virtual objects aiming to combine the two media in a single entity that is believable to the user; amount and customization of content relate to “the forms” and Manovich’s concept of database logic (*AV Clash* connects to *Freesound.org*, an online sound database); flexibility relates to “the operations”, the manipulation possibilities of the content; and usability and interactivity are connected to “the interface”.

After testing the questionnaire with two trial users, and improving it based on their feedback, it was put online in April 2011. Answers were received until mid-May 2011. The questionnaire was announced on the website of Video Jack (<http://www.videojackstudios.com>) and promoted on related social networks (Twitter and Facebook). It was composed of 81 questions, mostly close-ended, but also open-ended ones (13). The close-ended questions included essentially five-point Likert scales. The set up of the questionnaire followed a mixed methods (quantitative and qualitative) logic of having “predetermined response options for several questions, followed by a set of open-ended questions written to illuminate some aspect of the phenomenon under study” ([11], p. 235).

For this paper, sections of the questionnaire related to the comparison of *AV Clash* with previous Video Jack projects are excluded. Most of

the last part of the questionnaire, related to suggestions for future developments, is also not included. The answers to these questions should be analyzed in a future paper.

3. Results

The questionnaire was answered by 22 anonymous respondents. On average, the respondents have used *AV Clash* twice, although approximately half of the respondents have used it only once. They have spent an average of 12 minutes playing with the project. The main research question was divided into smaller questions, grouped into the categories identified in the previous section.

3.1 Integration of Sound and Visuals

This section of the questionnaire aimed to evaluate if the integration of sound and visual media in *AV Clash* is appealing to the test users, and if there is a preference for one of the two media. The vast majority (86%) of the respondents agree that the visuals in *AV Clash* add to the enjoyment of sound, with around one third answering that it adds very much, while 14% are indifferent. Approximately three quarters (72%) of the respondents also assert that the sound adds to the enjoyment of the visuals, with a significant percentage (nearly half) stating that it adds very much. Nevertheless, two respondents answered that the sound detracts from the enjoyment of the visuals, while 18% are indifferent. The combined use of sound and visuals in *AV Clash* seems to bring a greater deal of enjoyment than the isolated use of any of these (Figure 3).

When asked if the combined use of sound and visuals is appealing in artistic projects in general, all respondents answered affirmatively. This might indicate that the conclusions reached regarding *AV Clash* and the enjoyment of combined sound and visuals might extend to other new media art projects. One concern about using sound and visuals in coordination is that, by pre-

senting a sonic counterpoint to the visuals and vice-versa, users might feel that their imagination is limited, as it could inhibit them from imagining their own correlations, and constrain their feeling of creativity. Approximately two thirds of the respondents answered that the connection of visuals with sound in *AV Clash* does not limit their imagination, while nearly one third of the respondents answered it does.

Regarding the relative importance of sound and visuals, nearly half of the respondents (45%) consider it to be equal in *AV Clash*, although a larger percentage considers sound more important than the visuals (38% for the former, 16% for the latter). A possible explanation for this is the higher number of sounds available, since sounds are retrieved from an online database (Freesound.org), whereas animations are built-in and less numerous (Figure 4).

The vast majority (91%) of the respondents consider the visuals well suited to the sound in *AV Clash*, with approximately one quarter (23%) stating that they are very well suited. No respondent has stated that they were badly suited (Figure 5).

In an open-ended question, respondents were asked about their appreciation of the combination of sound and image in *AV Clash*, dividing it into positive and negative elements. Regarding positive elements, four respondents mentioned color combination, while another four mentioned rhythmical relationship and two mentioned more specific motion attributes (scaling, movement and rotation). Two test users showed appreciation for the shapes, whereas two more stated that they enjoyed the general visual logic (one of them mentioning the symbolic linking between sound and image). One of the users classified the visuals as “alluring, tempting and hypnotizing”.

Regarding negative aspects of the sound and image combination in *AV Clash*, one test user suggested to break the circular nature of the visualizations, which he/she considers re-

petitive. Another test user mentioned that the relationship between sound and shape is not very clear, while an additional participant manifested dislike for the vector style of *AV Clash*. Yet another test user considered the lack of tempo synchronization between sounds to be negative.

3.2 Amount and Customization of Content

The next section of the questionnaire aimed to assess if the test users were pleased with the amount of content available to play with. Regarding diversity of sounds, 56% of the respondents consider that the sounds were diverse enough to keep interest for a satisfactory amount of time, against 27% who did not agree with this statement. A similar percentage of participants, 54%, consider that the visuals are diverse enough, against 23% who consider otherwise (there is a larger percentage of users who are neutral regarding diversity of visuals) (Figure 6).

For nearly half of the respondents, using their own sounds within the project would be important, whereas the remaining half consider otherwise. Slightly more conclusive is the issue of using custom visuals: 55% of the respondents consider that this functionality would be important, versus 37% who do not. Again, this might be a consequence of the lower number of visuals compared with the number of sounds in the project.

Influenced by Kiefer et al., who assert that “an issue of particular importance in a musical usability study is allotted practice time” ([5], p. 89), the author noticed that there was a fluctuation of answers from the respondents based on their time of interaction with the system, measured by the number of interaction sessions. Although correlation analysis did not reveal any substantial relationship between both, a graphic comparing number of interactive sessions with the Likert scale answers reveals that there is a vague tendency for narrower variety of answers, closer to the top values (more

Figure 3. Enjoyment of sound and visuals, per user

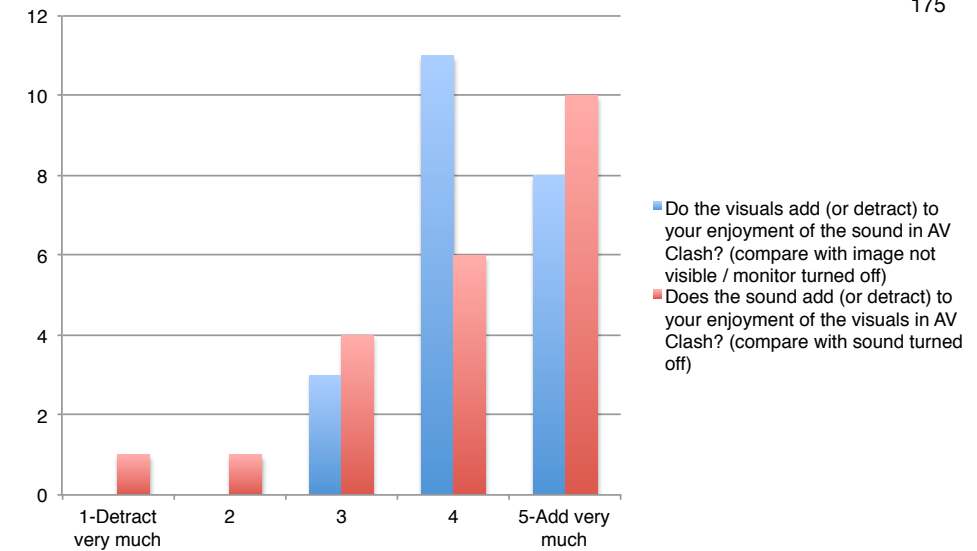


Figure 4. Relative importance of sound and visuals, per user

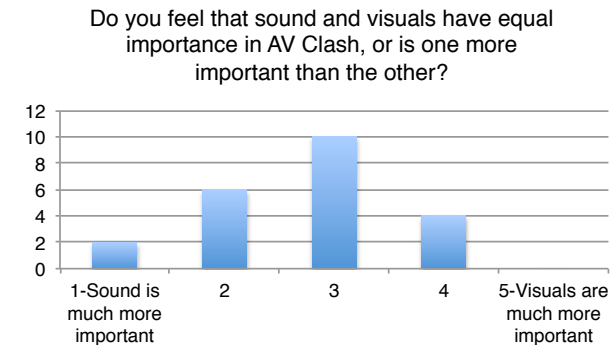
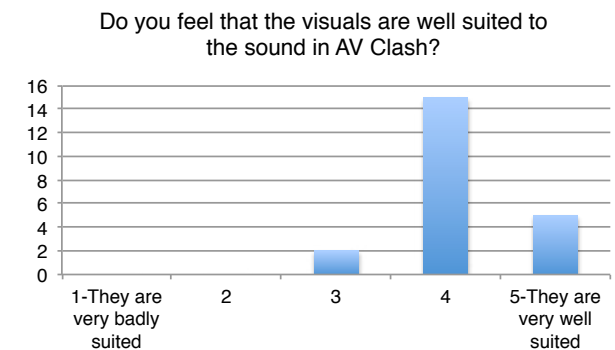


Figure 5. Mutual agreement of sound and visuals, per user



positive), the higher the number of sessions spent interacting with the project. The results are too few, however, to draw any definitive conclusions (Figure 7).

3.3 Flexibility, Usability and Interactivity

The following sections of the questionnaire were related to the amount of audiovisual manipulation functionalities and their usability. The objective was to estimate if enough manipulations options were available, while maintaining a satisfactory level of intuitiveness in the project. Regarding the amount of audio and visual manipulation options, approximately half of the respondents consider that it is neither too large nor too small, with 19% considering that there are too few options, and 28% stating that there are too many (Figure 8). An adequate balance seems to have been achieved regarding amount of manipulation options.

Nearly half of the respondents consider that the project behaves as expected, against 18% who consider it does not. Approximately one third is neutral regarding this issue. More than half of the test users consider that they have control over the project, against 18% who consider they do not. Around one fourth of the test users are neutral regarding this issue (Figure 9).

Concerning the clarity of the functionalities of the interface, the replies are evenly split between those that consider they are clear enough, and those who do not (Figure 10). These results seem to indicate that there is a divide between users—the project was not intuitive for a substantial percentage of users.

Again, comparing number of interaction sessions of test users with outcomes regarding clarity of the interface results in a narrower variety of answers, toward the top end of the Likert scale (more positive values), the more time is spent interacting with the project. However, the number of responses is still too low to reach any meaningful conclusion (Figure 11).

Regarding the user interface design, 86% of the test users consider that the integration of the interface elements with the animations is positive, and 82% consider to be positive that all the elements of the project are consolidated in the same area of the screen (unlike software for visual performance, for example, usually split in two: one with the interface and another with the outcome).

Approximately half of the respondents felt no need to read the instructions, while the remaining half felt that it was not enough to simply explore without instructions (again pointing to lack of intuitiveness). Some functionalities were found by most of the test users, while others were less easily discovered. Track change and volume was found by most of the test users (86%), whereas effect slider and effect button were used only by, respectively, 73% and 64% of the users. Dragging and throwing, designed to be a major functionality of the project, was used by only 59% of the respondents. The settings button, a more advanced functionality, was accessed by 45% of the test users (Figure 12).

On the more structural issue of linearity versus interactivity, 86% of the respondents prefer to interact with sound and visuals in *AV Clash* that to listen to a linear sound recording or watch a linear video recording of *AV Clash*. However, one test user manifested preference for pre-recorded audio, and two for pre-recorded video material (Figure 13).

A randomization button (“shuffle”) was added in order to create sudden changes in multiple parameters of *AV Clash*, which would otherwise require activating a large number of different interface elements. This functionality randomizes which sound loops are playing, and also the direction of the movement of each object, aiming to provide a one-click alternative to a heavier interaction with the project. When asked how much this option was used, 23% of the respondents declared using it, and the remaining ones not using it or using it very little. Us-

Figure 6. Diversity of sound and visuals, per user

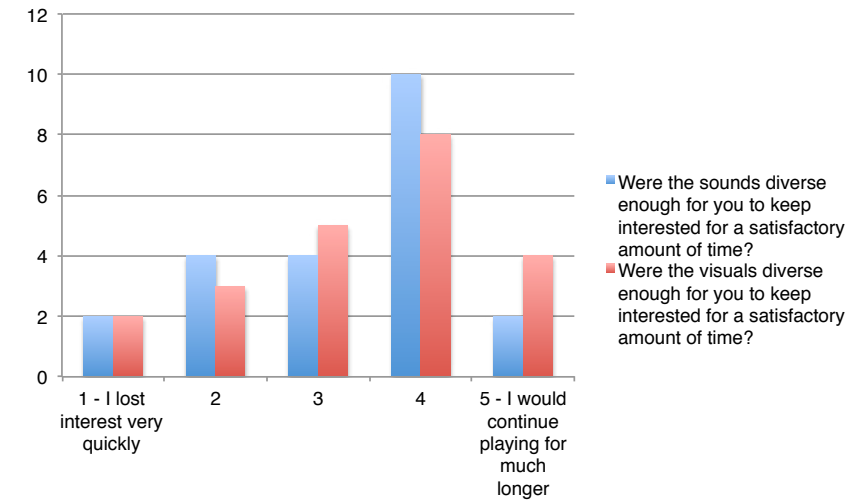


Figure 7. Comparing diversity of sound and visuals (vertical axis) with number of interaction sessions (horizontal axis)

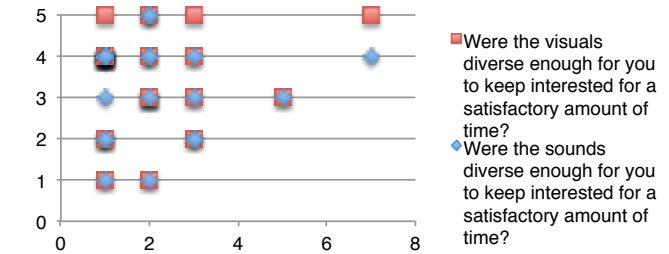


Figure 8. Degree of audio and visual manipulation, per user

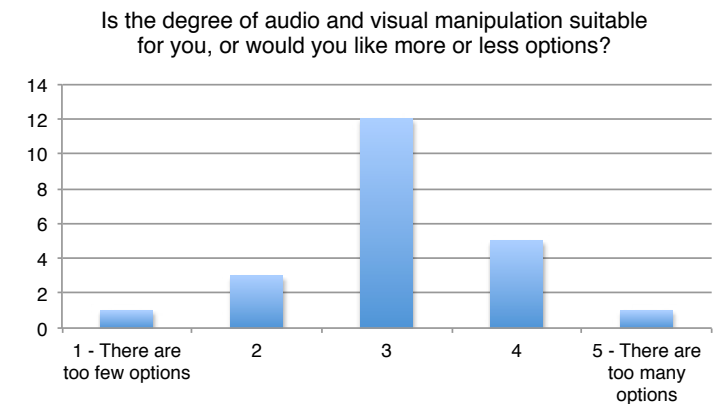
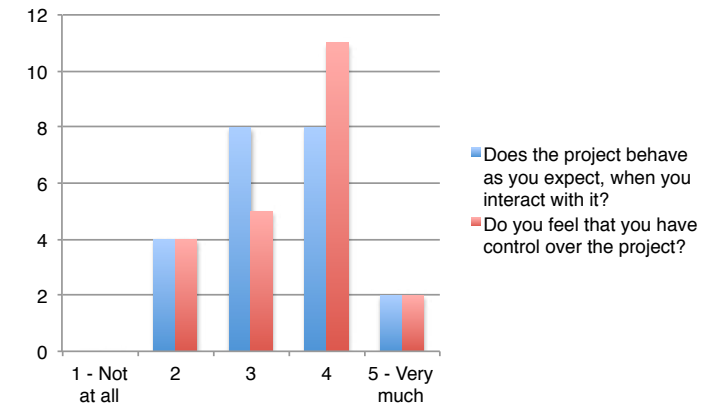


Figure 9. Predictability and control over project, per user



ers apparently prefer a more controlled experience, even if more intensive in terms of interaction, than a more random one.

Regarding general comments on the interactivity of *AV Clash*, five test users mentioned aspects related to complexity, learning and discovery process. One mentioned that it took a while to understand the functionalities, but that the learning process was pleasant. Another stated that “most of the times you just needed to blindly try” out the functionalities. One additional user would prefer the project to be more “game-like and humorous”, with a lower learning curve. Yet another stated that the “circular sound settings (effects, volume)” are “a bit confusing”. One last user manifested discontent that the project was neither a tool (“I can’t make a song or video with it”), nor a game (“you can’t win, no goal”). When asked to freely suggest future developments for *AV Clash*, three of the respondents suggested usability improvements, such as better indication of what areas can be clicked on; increase the size of buttons; add more explanatory texts to interactive elements; add keyboard shortcuts; and add an “intro mode” with more explanations and tool tips.

3.4 Creativity, Playfulness and Engagement

The objective of the following section of the questionnaire was to evaluate the experience, in terms of creativity and playfulness. Three quarters of the respondents answered that they feel creative when playing with *AV Clash*. Of these, three have answered that they feel very creative. Two additional test users were indifferent regarding this topic, while three users do not feel creative when using the project. However, approximately half of the respondents do not feel they are creating their own work with *AV Clash*, with 37% answering that they do. These percentages are inverted regarding the feeling of performativity: half of the users felt they were performing with *AV*

Clash, against 37% of users who did not (Figure 14). Although the majority of users feel creative, it does not seem to be perceived by them as a deep form of creativity.

The feeling of creativity, measured in a Likert scale, was also compared with the number of sessions spent interacting with the project. A similar tendency was detected of less variable results moving toward the higher end of the scale, the higher the number of sessions. Again, the low number of answers makes it difficult to draw any significant conclusions (Figure 15).

Nearly half of the test users considered that they “had fun” with the project, with another approximate half answering that they had “lots of fun”. It can be deduced that the vast majority (91%) of the test users had a playful experience. One user was indifferent to this issue and one answered he/she did not have fun (Figure 16).

When asked to comment on the overall experience of playing with *AV Clash*, approximately half of the respondents mentioned the fun and playfulness aspects of the project, with nine of the respondents using the word “fun” and an additional one the word “playful” to describe it. Three of the test users considered it technical and more oriented to professionals, while another considers it geared toward the more amateur “home DJ”. Two of the respondents consider it to be immersive or engaging. Two users described it as “surprising”. Yet another one described it as “meditative”. When asked if they would use *AV Clash* again, 91% of the users answered yes.

4. Reflections on the Questionnaire

The two initial trials of the questionnaire were very important to detect deficiencies, which were corrected before the launch of the questionnaire. As Kiefer et al. state, the importance of a trial study should not be under-estimated: “the best way to expose flaws in a script is to put it into practice” ([5], p. 89).

The length of the questionnaire was probably excessive, even after a few

Figure 10. Clarity of the interface, per user

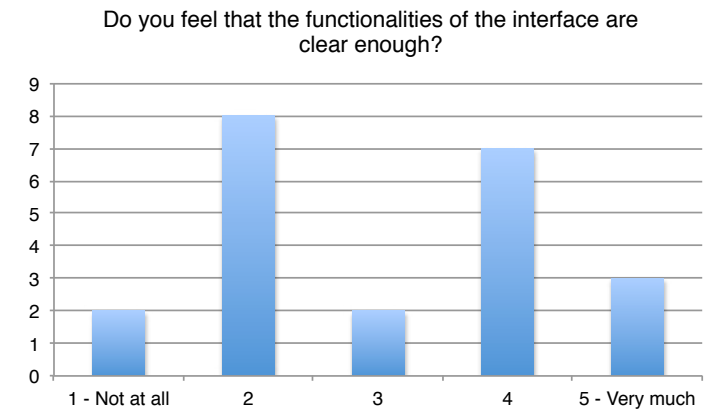


Figure 11. Comparing clarity of the interface (vertical axis) with number of interaction sessions (horizontal axis)

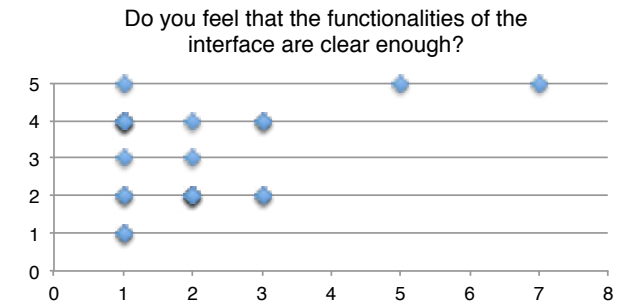


Figure 12. Functionalities tried, per user

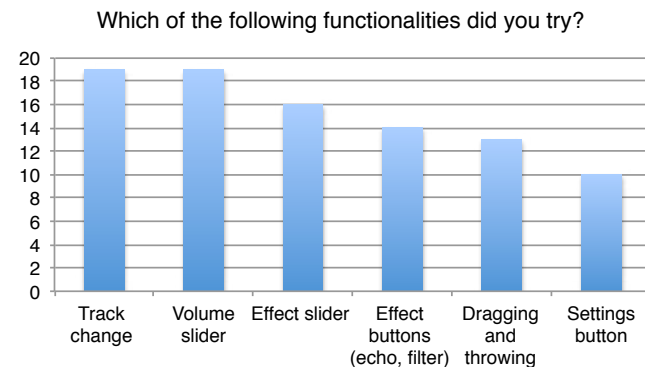
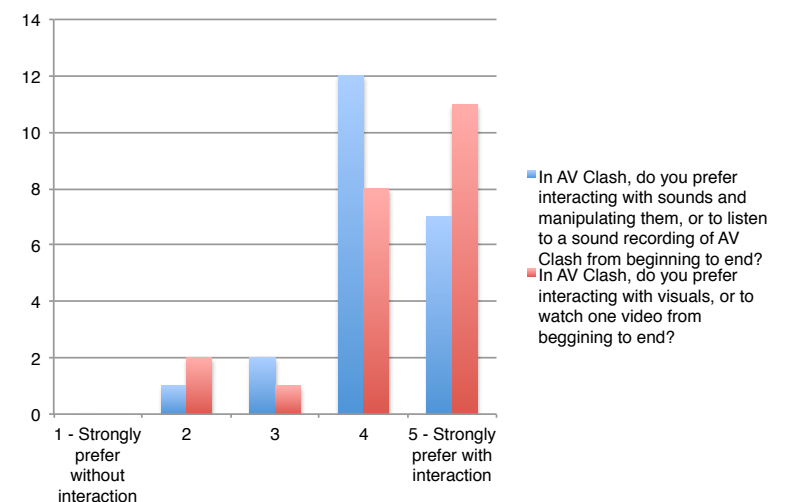


Figure 13. Preference for interaction or linear media, per user



questions were left out following the initial trials. A balance was attempted between collecting a large amount of data from a varied range of topics and keeping the participants motivated, but this might not have been successful. Some of the answers, particularly the open ones, were probably not very extensive due to this fact. It is possible that some potential respondents were intimidated by the length of the questionnaire. The author considers that more could have been done to reduce the number of questions.

A minimum time of interaction with the project could have been required before users would fill in the questionnaire. As Kiefer et al. assert relatively to musical usability studies (also applicable in *AV Clash* in the author's opinion), allocated previous usage time is important: "there's a lower limit on the time participants need to spend becoming accustomed to the features of an instrument; getting this amount wrong can result in unrepresentative attempts at a task, concealing the true results" ([5], p. 89). However, the author considers that it was useful to collect data from casual users who only interacted with the system briefly. In the author's opinion, *AV Clash* should not necessarily require a long attention span, although the project aims to reward a longer investment in time from the user.

The open-ended questions were very important in order to collect further thoughts on the projects from the respondents. It was beneficial to let the respondents use their own words to describe the project, pointing to directions that were not conceived when the questionnaire was designed (for example, a suggestion regarding breaking the circular nature of the animations). It also allowed for detecting some recurrent issues with users (such as appreciation for the interactive nature of the project, and usability concerns). The quality of the answers from these questions lead to the conclusion that interviews should be set up in the future to extract more open insights from users.

The number of respondents, while allowing the extraction of initial conclusions, is insufficient in order to deduct more generic ones, or detect correlations. Some patterns do emerge, which require further study.

5. Conclusions

The project had positive results in most of the five areas of the questionnaire (integration of sound and visuals; amount and customization of content; flexibility of manipulation; usability and interactivity; and creativity, playfulness and engagement), except for usability. The structure of the questionnaire around these five areas, with a focus on experience while including usability aspects, was useful to obtain answers regarding a wide range of relevant topics, and might be helpful for designing future evaluations of interactive audiovisual art projects.

5.1 Integration of Media, Amount of Content and Flexibility of Manipulation

The integration of sound and visuals seems to be successful, with the vast majority of the respondents (91%) considering the visuals well suited to the sound. Half of the respondents consider that there is enough diversity of sounds and visuals. Although more could be done to increase the amount of content, particularly on the visual side (where a higher diversity of style would also be beneficial), there seems to be a threshold where adding more content does not contribute much to user satisfaction. It might be equally important to focus on mechanisms that facilitate the access to that content. The author considers that a large amount of sounds and visuals may have remained undiscovered for users who only interacted briefly with the system. Improvements could be made to improve the explorability of content. As mentioned by one of the respondents, one "can't see how much stuff is in there". Users are split regarding the importance of customizing sounds

Figure 14. Feeling of creativity and performativity, per user

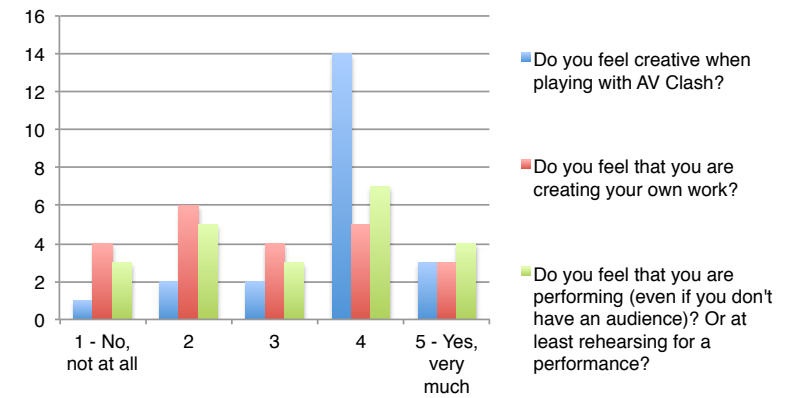


Figure 15. Comparing feeling of creativity (vertical axis) with number of interaction sessions (horizontal axis)

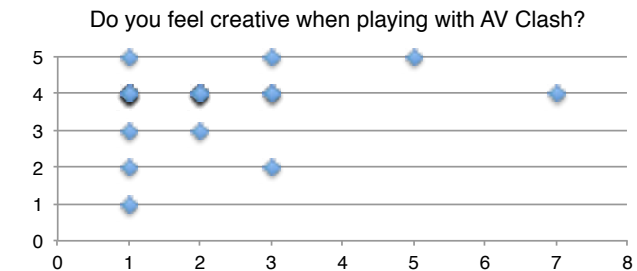
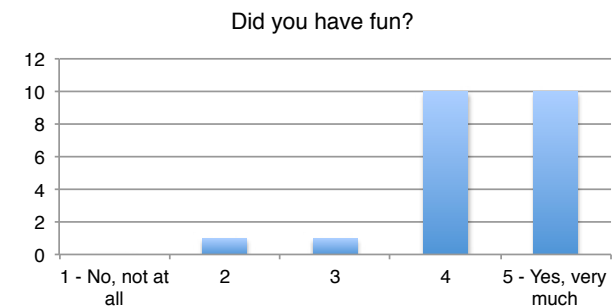


Figure 16. Feeling of fun, per user



and visuals, which may reflect that there are more advanced users who desire a larger diversity and deeper intervention on the content side, and those who are satisfied with exploring and manipulating a limited amount of existing materials.

It is hard to achieve a balance regarding the number of functionalities to include: too many will intimidate casual users, and too few will alienate advanced ones. As Donald Norman asserts, “the number of controls and complexity of use is really a tradeoff between two opposing factors” ([8], p. 209). However, *AV Clash* seems to have been successful in this respect: half of the respondents stated that the balance was satisfactory, and the remaining respondents were nearly evenly split between those who consider the functionalities to be too many or to be too few.

The duality detected in the responses regarding amount of content, customization and (to a lesser extent) functionality may indicate that there are (at least) two different audiences for projects such as *AV Clash*: one more attracted to playful exploration, and another one more interested in deeper manipulation and customization. It is challenging to satisfy both types of users with one project. An alternative approach could be to position projects concerned with interactive audiovisual creativity (such as future developments of *AV Clash*) toward one of these two groups: either a more introductory application that would be more playful, easy to use and “toy-like”; or one that could be used more effectively as a tool to create audiovisual experiences. *AV Clash* seems to be positioned in the intersection between these two groups.

5.2 Usability and Interactivity

Usability would need to be substantially improved, however, particularly in order to captivate casual users. Half of the users consider the interface to be unclear. The answers to open-ended questions also highlighted this as-

pect—usability issues appeared even in answers to unrelated questions. Nevertheless, the approach of integrating the interface elements with the animations seems positive for the vast majority of test users (86%). An equal percentage of participants also prefer the interactive approach of *AV Clash* toward music and visuals than linear sound or video. The appreciation of this interactivity was also recurrent in the answers to the open-ended questions. This seems to indicate that there is an audience to interactive audiovisual projects in the line of *AV Clash*, and that the integration of graphical user interface with sound visualization is a viable path.

The problems detected regarding usability and explorability deserve further discussion. As Donald Norman states, “one important method of making systems easier to learn and use is to make them explorable, to encourage the user to experiment and learn the possibilities through active exploration” ([8], p. 183). Norman goes on to list three requirements for a system to be explorable. First, the user should “readily see and be able to do the allowable actions” ([8], p. 183). Although efforts were done toward this (color coded buttons using a “street light” metaphor, rollover text tips), more could be implemented to convey the affordance of user interface elements. The participants supplied valuable usability suggestions, such as: better indication of what areas can be clicked on; increasing the size of buttons; add more explanatory texts to interactive elements; and add an “intro mode” with more explanations and tool tips. The second requirement in Norman’s list is that “the result of each action must be visible and easy to interpret” ([8], p. 183). Again, this was not fully achieved, with one of the users stating: “at times there was no immediate feedback”. The third and last of Norman’s requirements for an explorable system is that “actions should be without cost” ([8], p. 184). In this aspect, *AV Clash* seems to behave positively, as several test users manifested inter-

est in simply trying out different things, even if the result was unexpected and surprising. In fact, this seems to be part of the attraction of the project, particularly judging from the answers to the open-ended questions. This relates to the concept by Peterson et al. of aesthetic interaction, with its focus on “intriguing potential of interactive systems” ([9], p. 274).

In order to assist new users in their exploration of projects that aim to stimulate audiovisual playfulness, such as *AV Clash*, care should be taken in order to provide an introductory overview of what can be done with the system, without getting in the way of the interaction for more experienced users. In *AV Clash*, that is done mainly by means of “infotip” balloons, but based on the data gathered in the questionnaire this was not enough. One solution could be to create an “intro mode”, as one of the respondents suggested. This “intro mode” could be either an introductory animation, showcasing the most important functionalities, or an assisted mode with even more, and more detailed, “infotips”. This “intro mode” could be switched off by users once they got acquainted with the system. In the author’s opinion, this mode should not be too technical and should be in line with the aesthetics of the project. This way, it would integrate with the overall experience, without affecting a certain aura of mystery that seems to be part of its appeal.

5.3 Creativity, Playfulness and Engagement

Regarding the experience, three quarters of the participants feel creative when playing with *AV Clash*. The vast majority (91%) of the users stated that they had a “fun” experience, with half answering that they had “very much fun”. An equal percentage of users declared they would use the project again. When asked to describe the experience with the project in an open-ended question, nine of the respondents used the word “fun”, with others using expressions such as “playful”,

“immersive”, “engaging”, “surprising” and “meditative”.

The positive results regarding the experience-related questions seem to indicate that, despite the usability problems identified, a majority of users were willing to invest time exploring the interface and the functionalities in order to be rewarded in terms of playfulness and engagement. Again, this fits the concept of aesthetic interaction, which aims “to encourage the user to explore and playfully appropriate the system” ([9], p. 274).

The results of the questionnaire reveal that taking into an account an experience focus, as Kaye et al. [4] advocate, is fruitful in order to evaluate a new media art project such as *AV Clash*. Moreover, the results reveal that a usability component in a new media art project evaluation is very relevant. This component can evaluate if the interaction works as intended, as stated by Höök et al. [3], and if the user’s encouragement to explore does not disappear due to usability issues. There is room for improvement, and further inquiry, in *AV Clash* regarding this issue. The low number of respondents to the questionnaire (only 22) limits the extrapolation of specific results to other new media art projects.

6. Future Work

The author intends to further analyze the answers to the questionnaire, such as the ones comparing *AV Clash* to previous projects by Video Jack, which were out of the scope of this paper. The author also plans to conduct interviews to users, in order to delve further into some of the issues detected in the questionnaire, namely usability and explorability.

The author also intends to develop *AV Clash* further, and evaluate the new developments. Lessons learnt from the current questionnaire will be helpful toward improving the evaluation methodology. Data for a new questionnaire should be collected from more respondents, in order to reach broader conclusions related to new media art

projects, and interactive audiovisual projects in particular.

7. Acknowledgements

Thank you to Tapio Takala and Markku Reunanen for valuable insights regarding the questionnaire and this paper, and to all the respondents of the questionnaire.

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11 Article 7:

Paths in Interactive Sound Visualization: from *AVOL* to *AV Clash*

Abstract

This paper compares two multimodal net art projects, *AVOL* and *AV Clash*, by the author and André Carrilho (under the name Video Jack). Their objective is to create projects enabling integrated audiovisual expression that are flexible, easy to use, playful and engaging to experience. The projects are contextualized with related works. The methodology for the research is presented, with an emphasis on experience-focused Human-Computer Interaction (HCI) perspectives. The comparative evaluation of the projects focuses on the analysis of the answers to an online questionnaire. *AVOL* and *AV Clash* have adopted an Interactive AudioVisual Objects (IAVO) approach, which is a major contribution from these projects, consisting of the integration of sound, audio visualization and Graphical User Interface (GUI). Strengths and weaknesses detected in the projects are analysed. Generic conclusions are discussed, mainly regarding simplicity and harmony versus complexity and serendipity in audiovisual projects. Finally, paths for future development are presented.

1. Introduction

AV Clash (<http://www.avclash.com>) is a multimodal online project that allows for the integrated playback and manipulation of sound and visuals [1]. It was developed by the author and André Carrilho (assisted by Gokce Taskan), under the collective name Video Jack, and released in 2010. The sounds are retrieved from Freesound.org (<http://www.freesound.org>), an online sound database. *AV Clash* is the latest in a series of projects that aim to answer the following research question: how to develop a flexible, playful, engaging and easy to use tool for audiovisual expression. In this series of projects, *AV Clash* is particularly related to *AVOL* (Audio-Visual OnLine)—it can be considered an evolution of this earlier project (from 2007). Video Jack's previous projects had been mostly presented

in performances and exhibitions. With *AVOL* and *AV Clash*, Video Jack intended to reach a broader audience by additionally using the Internet as a platform, moving into the territory of net art. The projects also challenge the boundaries between author, audience and user. With these projects, Video Jack aim to pass to their audience part of the authorial process.

The projects fit into a broader cultural context of audience interest in participatory engagement with music; the ascendance of the music video with the emergence of MTV in the 1980s ([2], p. 31); and increasing importance of Internet as a distribution channel for media, particularly music and music videos. The interest in participatory engagement can be exemplified by the popularity of music games such as the *Guitar Hero* series, the third most influential game of the past decade according to *Wired* magazine [3]. As demonstration of the increasing importance of the Internet as music distribution channel, more than 660 million digital songs were sold in the first semester of 2011 in the USA, an 11 percent increase from the first half of 2010 [4]. The Internet has also become “a superb music video resource”, contrasting with the mutation of MTV and other music video channels into “a celebration of celebrity and wealth” ([2], p. viii).

2. From *AVOL* to *AV Clash*

AVOL (<http://www.videojackstudios.com/avol>) allows for the manipulation of audio and visuals aggregated in seven Interactive AudioVisual Objects (IAVOs) incorporating a Graphical User Interface (GUI), each with playback control functionalities including four main content options (Figures 1, 2). Each IAVO represents a certain type of sound (for example, drums or guitar).

The audio component in *AVOL* is fixed—it consists of music loops composed by the author, all with the same length. These loops were composed taking into account that they would be interchangeable. An internal clock en-



Figure 1. Screenshot of *AVOL*

sure that the sounds remain synchronized. These elements contribute to a more traditional “musical” character of *AVOL*, compared to the more chaotic nature of *AV Clash* (where sounds have different duration and diverse styles). *AVOL* possesses basic playback functionality (including stop and solo for each IAVO) and few audio manipulation options—only volume can be controlled.

The visuals in *AVOL* and *AV Clash* share multiple common characteristics: they consist of audio-reactive concentric vector animations (28 in *AVOL*, four per IAVO; 96 in *AV Clash*); the audio reactivity is based on the scaling of animations according to the amplitude of the correspondent sound; and the animations in both projects are abstract, conceived as a subjective interpretation of the type of sound they were meant to represent. Audio reactive visuals are an important element in both projects—they allow

Figure 3. Screenshot of *AV Clash*

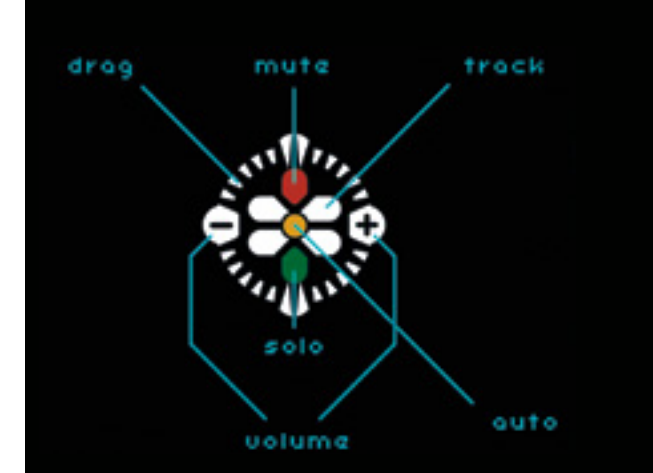


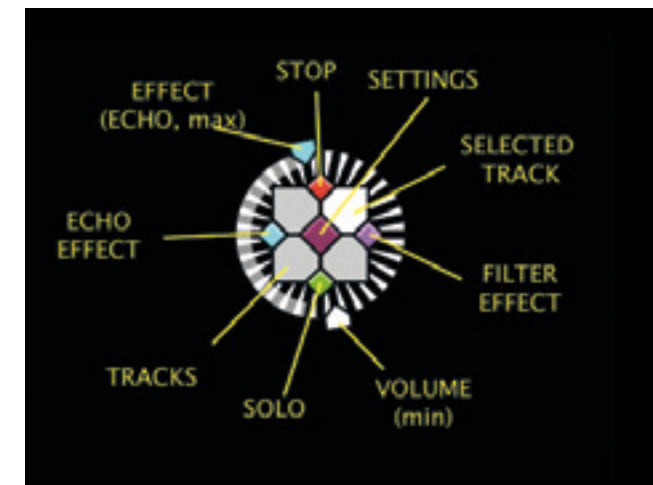
Figure 2. Detail of IAVO in *AVOL*

for the multimodal illusion that Chion has named “synchresis”: “the forging of an immediate and necessary relationship between something one sees and something one hears at the same time” ([5], p. 224).

With *AV Clash*, the author intended to solve some of the weaknesses he detected in *AVOL*: scarce amount of sounds; inexistent sound customization; insufficient audio manipulation; limited playfulness; lack of randomization features; and usability deficiencies. *AV Clash* addressed those limitations, while maintaining the IAVO approach of integrating GUI with sound visualization (although the number of objects was reduced to four) and the style of visuals (Figures 3, 4).

The limitations related to the amount and customization of sounds were addressed by connecting to the online sound database Freesound.org, which classifies sounds by tag. *AV Clash* accesses 11 of the tags (such

Figure 4. Detail of IAVO in *AV Clash*



as “noise” and “voice”) with the highest number of sounds and retrieves the most popular sounds (according to number of downloads) within those tags. Initially 20 sounds per tag were taken into account, resulting in a total of approximately 220 sounds.

By accessing a menu system, users can change the sounds and animations contained in each object, and even the tag of that object. Four easily accessible pairings of sounds and visuals (“favourites”) can be picked for each of the objects (these four pairings are randomized at the start of each session). An additional tag (“avclash”) was set up in order to allow users to upload their sounds to *AV Clash*, via Freesound.org.

Sound manipulation capabilities were added: effects (“echo” and “filter”) and sound trimming (start and end points). As an extra element of playfulness, users can “throw” objects around the screen. A randomization feature was created: a “shuffle” button that randomizes which sound and animation are playing in each object, and moves the object in a random direction, thus enabling a quick change of audiovisual character with a single button press. Another issue addressed in *AV Clash* was usability. The author felt that the lack of identification of each object in *AVOL* hindered its ease of use. In *AV Clash*, objects are identified by colour and by a balloon-shaped “info tip” showcasing the tag name. Moving the cursor over a GUI element reveals further information.

3. Contextualization with Related Works

There is a long history behind the combination of music with the visual arts, and the pursuit of a correspondence between image and sound. Ancient Greek philosophers such as Plato and Aristotle speculated that there was a correlation “between the musical scale and the rainbow spectrum of hues” [6]. In the 19th century, Richard Wagner envisioned a genre of artwork that would combine different arts—a

“total art work” (*gesamtkunstwerk*). Wagner described it as an operatic performance that encompasses music, theatre and the visual arts: “the true Drama is only conceivable as proceeding from a common urgency of every art towards the most direct appeal to a common public”. To achieve this, “each separate branch of art can only be fully attained by the reciprocal agreement and co-operation of all the branches in their common message” ([7], p. 5).

The development of cinema opened the door to further explorations between music and image. Oskar Fischinger (1900-1967) was one of the notable pioneers of this field and was dedicated to a purely abstract approach of visual representation of music. Fischinger was inspired by Bernhard Diebold, who called for “a new blend of the fine arts, music, dance and cinema—or better, new artists, ‘Bildmusikers’ [visual musicians]” to achieve Wagner’s ideal of *gesamtkunstwerk*, “preferably abstract in nature” ([8], p. 4). When Fischinger moved to the USA in 1936, “his work and presence became an inspiration to a second generation of Colour-Music artists” such as Jordan Belson, Harry Smith and brothers John and James Whitney, who decided to take up abstract animation influenced by him [9].

The development of computing brought about new possibilities for artists in visual music. John Whitney was among the first to explore these possibilities, and his elegant abstract work was an inspiration for the animations in *AVOL* and *AV Clash*. Golan Levin is a notable example of a contemporary artist in this field, with projects such as his *Audiovisual Environment Suite (AVES)*, “an interactive software that allows for the creation and manipulation of simultaneous visuals and sound in real time” ([10], p. 133), using an abstract aesthetics. Levin’s influence is apparent in the work of Video Jack, as is Toshio Iwai’s, with works such as *Electroplankton*, a set of ten “musical toys”, each taking place “in some sort of bizarre petri dish—or perhaps a very

musical aquarium—filled with different species of plankton that can produce sound and light when you interact with them” [11].

4. Methodology and Framework

Between April and May 2011, an online questionnaire was conducted to determine if *AV Clash* had succeeded in its objectives, as defined by the research question it addresses: how to create a tool for integrated audiovisual creativity, with customizable content, that is flexible, easy to use, playful and engaging to observe? Because some of the objectives are related to solving insufficiencies detected in previous projects, the questionnaire included sections comparing *AV Clash* to earlier projects by Video Jack: *Master and Margarita* and *AVOL*. *Master and Margarita*, a project that shares fewer resemblances with *AV Clash* than *AVOL* does, will be left out of the scope of this paper.

The different elements of the research question *AV Clash* addresses structured the sections of the questionnaire: 1) audiovisual integration and type of content; 2) amount of content; 3) flexibility—content manipulation capabilities; 4) usability, ease of use and exploration; 5) creativity and experience. Each section included questions comparing *AV Clash* with previous projects. The questionnaire was composed of 81 questions, mostly close-ended, but also 13 open-ended ones.¹ For this article, the comparison questions and the questions related to future developments are taken into account.

In order to develop the different sections of the questionnaire, literature on experience-focused human-computer interaction (HCI) and usability were important sources. Experience-focused literature has detected gaps between HCI methodologies and the ones used by new media artists. One the one hand, some authors identify a ten-

¹ A static version of the questionnaire can be found at: http://www.videojackstudios.com/survey/avclash_questionnaire.pdf

gency in interactive art to ignore HCI methodologies for interaction, “based on a mostly unstated belief that they do not measure aspects of interactive artworks that are of interest to artists” ([12], p. 241). Höök et al. consider that user studies can assist artists “that want to express themselves through an interactive system” to make the interaction “work as intended” ([12], p. 248). On the other hand, some authors note that evaluation of experience-focused applications should go beyond usability: “to evaluate merely on usability is to miss the very point of these technologies” ([13], p. 2118).

As a consequence, the field of HCI has been developing the concept of experience-focused HCI, “recognizing a widening of the sphere of HCI out of the workplace and into the world, and emphasizing the importance of culture, emotion, and lived experience” ([13], p. 2118). Following in this direction, Peterson et al. propose the notion of aesthetic interaction as an “extended expressiveness towards interactive systems”, that would reach “beyond ideals of efficiency and transparency, e.g. like considering the emotions, attraction, and affect invoked by design” ([14], p. 269). It is focused on “intriguing and sometimes even ambiguous aspects”, and it aims to “encourage the user to explore and playfully appropriate the system”, by “creating involvement, experience, surprise and serendipity in interaction” ([14], p. 274). Explorability was indeed an important aim in the design of the projects, since, as Donald Norman states, “one important method of making systems easier to learn and use is to make them exploratory, to encourage the user to experiment and learn the possibilities through active exploration” ([15], p. 183).

5. Results

The questionnaire was promoted in the Video Jack home page and related sites. It was open to any respondents, and was answered by 22 anonymous test users. Approximately two thirds

of the respondents had a master's degree. The vast majority (91%) of these test users had experience as new media artist and/or new media designer. Half had experience as DJ (disk jockey) and/or musician. All had experience as viewers/listeners of new media art projects and of net art projects. Therefore, the respondents appear to be experienced users of interactive content and familiar with media production. On average, the respondents have used *AV Clash* two times and spent 12 minutes playing with the project per session.

5.1 Audiovisual Integration and Type of Content

AV Clash is considered to integrate audio and visuals better by approximately half of the respondents, while nearly one-fourth answered *AVOL*, and an equal percentage of users consider them to be in the same level. From the six test users who preferred *AVOL*, four mention the issue of simplicity, with one user elaborating further: "the connection with the sound is more simple and more obvious". Two of these test users replied that the end result was more appealing. From the respondents who expressed preference in the sound and image integration in *AV Clash*, three answered that the project, in terms of interface and logic, was easier to understand. Two of the respondents mentioned that their choice was due to a higher amount of manipulation options in *AV Clash*.

The results are slightly more balanced when comparing exclusively the sonic approach of *AV Clash* with the one in *AVOL*. 41% of the test users prefer the sound and music approach of *AV Clash*, against 32% who prefer the approach of *AVOL*, with 27% enjoying equally both. The test users who preferred the sounds in *AVOL* stated that the synchronization of the loops, the fact that the sounds were curated, and the inclusion of percussive elements were factors for their choice. Three test users who preferred *AV Clash* mentioned the variety of sounds (and another one mentioned the lack

of this variety in *AVOL*), while two mentioned the higher level of control as reasons for their preference. Another respondent preferred the sounds in *AV Clash* because they were "more abstract and neutral". One of the users who enjoyed equally both mentioned that while *AVOL* offers more harmony due to its preselected set, *AV Clash* offers more variety. Another respondent who also manifested equal preference mentioned that *AVOL* was better for rhythm due to loop synchronization, while for other type of sounds *AV Clash* was preferable due to its larger amount of content. One user preferred *AVOL* due to the larger number of control possibilities, which reveals there were aspects of *AV Clash* that remained undiscovered (since it is the latter that offers more control functionalities).

5.2 Amount of Content

One of the main aims of *AV Clash* was to increase substantially the number of sounds that could be accessed, compared to *AVOL*. One of the sections of questionnaire concentrated on this aspect. Approximately two thirds (68%) of the respondents consider that the possibility of accessing a larger amount of content in *AV Clash* than in the previous project is appealing, against 27% who do not (Figure 5).

In *AV Clash*, most of the content is not immediately accessible or visible (only 16 sounds and animations are). To access the extra content, users have to press a "settings" button. More experienced users are assumed to discover this additional content, and value it more, while novice users may be less likely to do so. Following the conclusions of Kiefer et al., who state that allotted practice time is particularly important in a musical usability study ([16], p. 89), the duration of the interaction with the system (measured by the number of interaction sessions) was correlated with the appeal of additional content. Even though correlation analysis did not reveal any substantial relationship between both, a graphic comparing number of interaction set-

Did you find the possibility of accessing more sounds and visuals in *AV Clash* appealing, compared with *AVOL*?

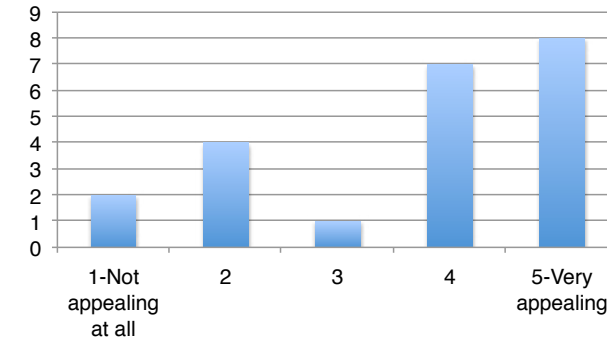


Figure 5. Appeal of additional content in *AV Clash*

Did you find the possibility of accessing more sounds and visuals in *AV Clash* appealing, compared with *AVOL*?

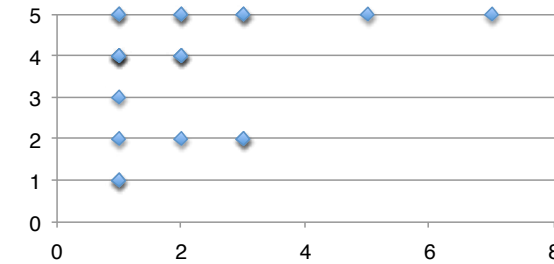


Figure 6. Comparing appeal of additional content (y axis) with number of interaction sessions (x axis)

Comparing to *AVOL*, are the additional audio manipulation options in *AV Clash* interesting?

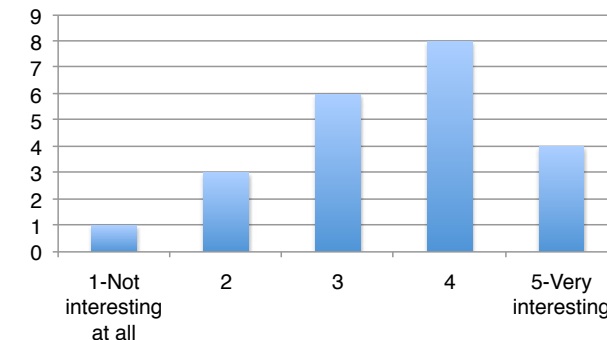


Figure 7. Appeal of additional audio manipulation in *AV Clash*

Comparing to *AVOL*, are the additional audio manipulation options in *AV Clash* appealing?

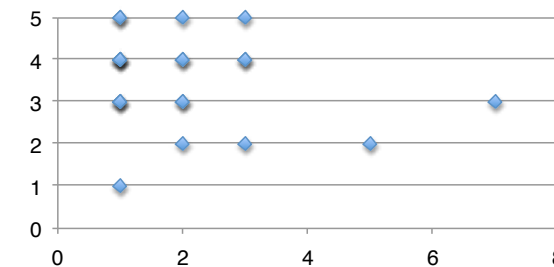


Figure 8. Comparing appeal of additional manipulation options (y axis) with number of interaction sessions (x axis)

tings with the appeal of additional content reveals that users who have interacted more with *AV Clash* tend to find the additional content very appealing, with a more varied range of responses for those who have interacted less (Figure 6). This leads to the conclusion that the diversity of content in *AV Clash* may remain undiscovered for novice users.

5.3 Flexibility, Usability and Intuitiveness

Besides increasing the amount of content compared to *AVOL*, *AV Clash* also aimed to increase the amount of sound manipulation capabilities, such as “echo” and “filter” audio effects and sound trimming. A section of the questionnaire was dedicated to assessing if the test users valued these developments. Comparing *AV Clash* to *AVOL*, approximately half of the test users consider the additional audio manipulation options in the former to be interesting, against 18% who did not. Nearly one quarter of the respondents are indifferent (Figure 7).

Approximately three quarters of the test users have spent more time interacting with *AV Clash* than with *AVOL*. When asked about the reason for this preference, in a multiple-choice question, 73% of the respondents mentioned the larger amount of manipulation options, while 40% mentioned the larger amount of content. 47% of the users indicated “other”, and these were asked to elaborate. One of the users stated that “the interface felt clearer, and easier to learn and manipulate”. To assess if more time spent interacting with *AV Clash* would lead to a higher interest in audio manipulation options, the number of interaction sessions were compared with the appeal of the added functionalities (regarding *AVOL*). Unlike the added audio content, appreciation for the extra audio manipulation options does not seem to increase with more interaction sessions (Figure 8). One possible explanation is that most of the audio manipulation options are immediately

available (simply by dragging faders on the IAVOs), unlike most of the added content, which requires further exploration (accessing the settings area).

The additional options in *AV Clash*, compared to *AVOL*, created a challenge: how to add functionalities to *AVOL* while improving the usability? A section of the questionnaire compared the ease of use of *AVOL* and *AV Clash*. The answers are evenly split. Approximately one third of users consider *AV Clash* to be more intuitive to use, whereas a similar percentage reply that *AVOL* is more intuitive. More than one-fourth of respondents consider that they are on the same level regarding intuitiveness. When asked the reasons behind their choices, six out of the eight users who considered *AVOL* more intuitive mention the simpler interface and fewer options as the reasons for their choice. Three of the users who found *AV Clash* more intuitive manifested preference in the project’s UI.

5.4 Creativity and Experience

All the previous aspects—multisensoriality, type and amount of content, manipulation options, ease of use—aim to contribute to engagement, playfulness and expressiveness. Particularly important was to evaluate the degree of expression allowed by *AV Clash*: did the new features added to *AV Clash* contribute to a more creative experience than *AVOL*, as it aimed to?

As previously mentioned, nearly three quarters of the users have spent more time interacting with *AV Clash* than with *AVOL*. More than half (59%) of the respondents consider that *AV Clash* gives a higher feeling of creativity, whereas two respondents chose *AVOL*. Around one quarter answer both, and two test users answered that they do not get a feeling of creativity from either. Of the 13 respondents who consider that *AV Clash* gives a greater feeling of creativity than *AVOL*, seven mention more control or more options and one respondent mentions more variety in sound as reasons for

their choice. One of the respondents who consider that both projects give the same feeling of creativity considers that both projects shape the sound and visuals too much to allow for their own creativity, and one of the users who did not get a feeling of creativity from either mentions that the projects are “too structured”. One of the two test users who consider *AVOL* to offer a more creative experience mentions that the selected sounds “fit together nicely”, adding that switching between them created interesting results.

5.5 Future Developments

The final section of the questionnaire was dedicated to exploring possible future developments of *AV Clash*. Test users were questioned regarding what functionalities they found attractive to be added to the project, by selecting from a list or writing their own suggestions.

Regarding suggestions for new functionalities, recording audio/video or saving options (chosen by 64% of the respondents) and sharing recordings by e-mail or social networks (selected by 73% of the users) are among the most desired additions. Visual customization (drawing or uploading visuals) is important for 73% of the respondents, whereas sound input is relevant for 59% of the test users. The lower diversity of visuals in *AV Clash* compared with the diversity of sounds can explain a stronger wish for visual customization. Concerning other platforms for using *AV Clash*, 64% of the respondents would like to use it as installation, whereas approximately half would wish to see *AV Clash* adapted to other devices, such as games consoles or mobile phones. Collaborative functionalities would also be important for approximately half of the respondents. Users seem to be less interested in increased manipulation capabilities (46% consider it important), higher diversity of content (only 19% consider useful to add more tags to the 12 existing ones) and more random functionalities (one third regard this as an

important aspect).

When asked to freely suggest future developments for *AV Clash*, three of the respondents suggested usability improvements, such as: better indication of what areas can be clicked on; increasing the size of the buttons; adding more explanatory texts to interactive elements; adding keyboard shortcuts; and adding an “intro mode” with more explanations and tool tips. Five other test users suggested feature additions. Some of these additions coincided with the ones presented in the multiple answer questions, while others went beyond those, such as: using the spatial coordinates of the screen to affect some parameters; using physics when throwing; adding a sound synthesis engine with short midi patterns; and adding a master volume slider.

6. Conclusions

The answers to the questionnaire might be biased towards favouring *AV Clash*. As it was the most recent project, and the focus of most of the questions, respondents might have spent more time interacting with it than with *AVOL*. Additionally, the number of the respondents to the questionnaire was not high (22), limiting the extrapolation of results and the achievement of more generic conclusions. The length of the questionnaire (81 questions) might have intimidated other potential respondents. Despite this, the results offer insights to a wide range of important issues related to interactive audiovisual projects, and also point the way for future developments in this path. Taking into account experience-focused HCI perspectives in the evaluation of the projects, while considering usability issues, was important in order to cover a wide range of topics.

One of the most important contributions of the projects is the concept of Interactive Audiovisual Objects (IAVOs) as a modular approach to visual music projects: each sound is combined with a matching animation visualizing it, containing GUI elements. Those GUI elements are embedded in the visuals,

and aesthetically integrated with the animation style and with the overall visual character of the project, adding to a coherent experience. The projects implement this IAVO approach differently, leading to important distinctions. The IAVOs in *AV Clash* contain a larger number of GUI elements than *AVOL*, which results in diverse levels of satisfaction for different types of users.

The results of the questionnaire show that *AV Clash* was more successful than *AVOL* in most of the aspects analysed: integration of sound and visuals; amount and diversity of content; flexibility of manipulation; creativity and experience. Some important exceptions arise, however. In terms of audio, comparing the chaotic and diverse approach of *AV Clash* with the more conventional and synchronized nature of the music loops in *AVOL* leads to nearly balanced results (41% prefer the former, and 32% the latter). Notably, *AV Clash* seems to have not succeeded in improving the usability of *AVOL*. When asked which one was easier to use, users were evenly split between the two projects. The improvements in usability that were introduced (“info tips”, colour coding of IAVOs) seem to have been offset by the complexity of the added functionalities.

Although *AV Clash* was the most successful project for the majority of users, in most of the sections of the questionnaire, it is important to analyse why a still significant minority of users preferred *AVOL*. As was presented above, *AVOL* obtained similar results to *AV Clash* in terms of ease of use. When asked for the reasons behind their answer, six out of the eight users who consider *AVOL* more intuitive mention the simpler interface and fewer options of the project. Four of the six users that prefer the connection of sound and visuals in *AVOL* favour its “simplicity”, while two find the end result more appealing (presumably on the sonic side, as the visual side is aesthetically similar). The one third of respondents who prefer the sonic approach of *AVOL* appreciated the syn-

chronization and harmony of sounds (“they fit together nicely”, as one user put it) and rhythmical nature. A project with a limited set of options and simple interface, and with a harmonious, well-synchronized audiovisual content, can be as appealing as a more complex and diverse one. For some (although a minority according to this study), more content and more manipulation options do not lead to a higher engagement. Adding functionalities and content might be attractive for some users, but others prefer a simpler, more curated approach. *AVOL* and *AV Clash* represent a trade-off: simplicity of usage, synchronization and harmony of content in the former, versus diversity of options, variety and unpredictability of content in the latter, with users positioning themselves differently in their preferences.

There appear to be three groups of users: those who prefer the simpler and more “harmonious” approach of *AVOL*; those who are happier with the higher diversity and options of *AV Clash*; and one third group of users that feel that they are “too structured to allow for creativity”, as one of the users expressed. Future interactive audiovisual applications (such as further developments of *AV Clash*) could contemplate this third group, by providing more customization options and more content (particularly on the visual side). The identification of these three groups, with different demands regarding content and functionalities, might be important in terms of targeting future interactive audiovisual projects.

Paths for future developments of *AV Clash* should contemplate wishes expressed by the respondents, and these might be relevant for other audiovisual projects. Recording audiovisual sessions and sharing these by email or social networks would be attractive features for, respectively, 63% and 73% of the users. This could be accomplished by adding a “sequencer” (editable or not) that would record all the steps taken by the user, retrievable with a custom URL, or simply by

recording video or audio files, with the option of uploading them to sites such as YouTube or SoundCloud. Possibly due to the lower variety of the visuals compared with the audio in *AV Clash*, developments in visual customization would be important for 73% of the respondents. A solution for this could be the creation of a drawing area within the project that would generate vector animations, or the creation of a vector drawing and animation database, which would be an adequate counterpoint to the sound database provided by Freesound.org. Other platforms should also be explored for *AV Clash*, or similar future interactive audiovisual projects. Nearly two thirds of the respondents would like to use it as installation, and approximately half would enjoy using *AV Clash* in other platforms such as games consoles or mobile devices. Multitouch screen platforms such as iOS and Android devices seem to be particularly appropriate to the IAVO approach, as users would be manipulating the visualizations more directly with their fingers. Collaborative functionalities, allowing for networked composition for example, could also be added, as these are considered important for approximately half of the respondents.

However, care should be taken when adding new functionalities. Users seem to be less attracted to more manipulation options, or to adding content, than to improvements in ease of use. Usability problems seem to be quite relevant—it is an issue that often appears under the open-ended questions, even in the section related to future developments. These problems confirm the importance of user studies in art projects, as Höök et al. have advocated [12]. Improvements in the interaction design should encourage users to better “experiment and learn the possibilities through active exploration” ([15], p. 183). Future developments of *AV Clash*, and similar audiovisual projects, should particularly foster the explorability of content.

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List of performances and presentations

Presentations of projects developed in the scope of the present study, in international festivals and events:

AV Clash

- Pluto Festival, Opwijk, Belgium (installation and performance, 2012);
- FILE, São Paulo, Brazil (screening, 2012);
- Cut&Paste Festival, Korjaamo, Helsinki, Finland (performance, 2012; *Master and Margarita* also presented).
- ACM Multimedia, Interactive Art Exhibition, Scottsdale, USA (installation, 2011);
- Speed Show Exhibition, Milan, Italy (installation, 2011);
- South by Southwest Festival, Mexican American Cultural Center, Austin, USA (performance, 2011; *Master and Margarita* also presented).

Master and Margarita

- Lunchmeat Festival, Meet Factory, Prague, Czech Republic (performance, 2010);
- Pärnu Film and Video Festival, Pärnu, Estonia (performance, 2009);
- Pöff Festival, Kanuti Gildi Saal, Tallinn, Estonia (performance, 2009);
- Future Places Festival, Maus Hábitos, Porto, Portugal (performance, 2009; won Honorable Mention award);
- Mapping Festival, Geneva, Switzerland (performance, 2009);
- PixelAche Festival, Kiasma Theatre, Helsinki, Finland (performance, 2009);
- Electro-Mechanica Festival, St. Petersburg, Russia (performance, 2008; project preview; *AVOL* and *Heat Seeker* also presented).

AVOL

- Abertura Festival, Lisbon, Portugal (performance, 2008);
- Live Herring Festival, Jyväskylä Art Museum, Jyväskylä, Finland (installation, 2008);
- Create, London, UK (installation, 2008);
- Re:new, Copenhagen, Denmark (installation, 2008);
- Cartes Flux Festival, WeeGee, Espoo, Finland (installation, 2008).

Heat Seeker

- Le Cube Gallery, Paris, France (DVD screening, 2008);
- FILE, São Paulo, Brazil (DVD screening, 2007);
- Digital Entertainment Jam, Beijing, China (DVD screening, 2007);
- Abertura Festival, Lisbon, Portugal (performance, 2007);
- Videofestival, Bochum, Germany (performance, 2007);
- WRO 07 Festival, Wroclaw, Poland (performance, 2007);
- Optronica festival, British Film Institute, London, UK (DVD screening, 2007).

Annex 2

Guide to web content and documentation

This annex aims to present an introduction to the main areas of the Video Jack website, and related sites relevant for this study (such as my own webpage and social networks). All links can be easily accessed from <http://www.videojackstudios.com>.

2.1 Projects

All projects included in the scope of the study (and earlier projects) can be accessed from:

- www.videojackstudios.com

In the list of projects, simply click “ENTER PROJECT” to access a specific project, or click the project name to visit the documentation page.



2.2 Music

Soundtracks to the projects (released under my alias “Codem”) can be listened to here:

- www.videojackstudios.com/c/music

By clicking on a specific soundtrack, a page is shown with a SoundCloud player embedded, where the soundtrack can be streamed.



2.3 Events - documentation of presentations

In this section, documentation can be found regarding major Video Jack presentations (such as the ones presented in Annex 1), usually including video, photos and a descriptive text:

- www.videojackstudios.com/c/events



2.4 Press

Press clippings, quotes and videos relative to Video Jack projects (essentially Portuguese press for *Heat Seeker* and *AVOL*, Finnish TV for *Master and Margarita*, and international media coverage for *AV Clash*, complemented by links to spontaneous feedback regarding this project on Twitter):

- www.videojackstudios.com/c/press



2.5 Vimeo

Vimeo is our preferred web video repository. Besides the good design, functionalities and high quality videos, the community is very vibrant, and we often engage in a constructive discussion on the website. There is a good overlap between our audience and Vimeo's. I have created albums of videos per project, making it easier to navigate. Vimeo videos are embedded in the home page of Video Jack.

- www.vimeo.com/videojackstudios



2.6 YouTube

Although the video quality of YouTube is not as high as Vimeo, it allows us to reach a broader (if not as specialized) audience. I also upload to YouTube certain videos that are of lower quality than the ones found in Vimeo, such as documentation of performances. I believe that the quality expectation in YouTube is not as high as in Vimeo. YouTube also makes it easier to embed and filter multiple videos on our website than Vimeo (these videos are embedded throughout our site). I have created playlists of videos per project, aiming to make it easier to navigate in the website.

- www.youtube.com/videojackstudios



2.7 Flickr

Flickr is our repository of choice for images, from documentation of presentations to screenshots, press clippings, posters, etc. Flickr images are embedded thoroughly in our website.

- www.flickr.com/videojackstudios



2.8 Facebook, Twitter, Google+

We use Facebook, Twitter and Google+ to distribute any content that has been uploaded to Vimeo/YouTube or Flickr, and to post news regarding projects and presentations. Our presence in Google+ is still in its infancy (as is Google+ itself). We have recently canceled our MySpace page, since I felt we no longer had an audience there.

Facebook is particularly effective as a promotional tool (see Annex 3) and as a means of engaging in discussion with our audience. Twitter, due to its search tools, allows to track tweets mentioning Video Jack and our projects, which is an excellent means to gather feedback.

- www.facebook.com/videojackstudios

- www.twitter.com/videojack
- <http://plus.google.com/110661121360134013081>

2.9 NunoCorreia.com and related sites

My own website can be seen as the “laboratory” for Video Jack. While some of the sections in my personal webpage overlap with the Video Jack website, other sections provide more research related elements that might interest some audience members:

- www.nunocorreia.com

such as:

- the “Events” section, containing mostly documentation of talks and presentations in universities and conferences;
- the “Publications” section, where my publications are listed, and public access ones are embedded;
- the “Teaching” section with an overview of my teaching.

More in-depth teaching materials can be found in my teaching website at Media Lab Helsinki:

- <http://mlab.taik.fi/mediacode>

Other related sites function as repositories of different elements on the topic of audiovisual art:

- The AudioVisual Clash blog has notes on research related activities, and also on viewings, such as audiovisual-related DVDs, exhibitions and iOS apps:

o <http://avclash.wordpress.com>

- My own Vimeo and YouTube channels collect videos on the web related to audiovisual art:

o www.vimeo.com/channels/audiovisions

o www.youtube.com/nunocorreiatv

These websites are dynamic – they have been changing substantially throughout the years. I will continue to reorganize the materials between the different sites, and also to adopt new relevant web tools as they appear.

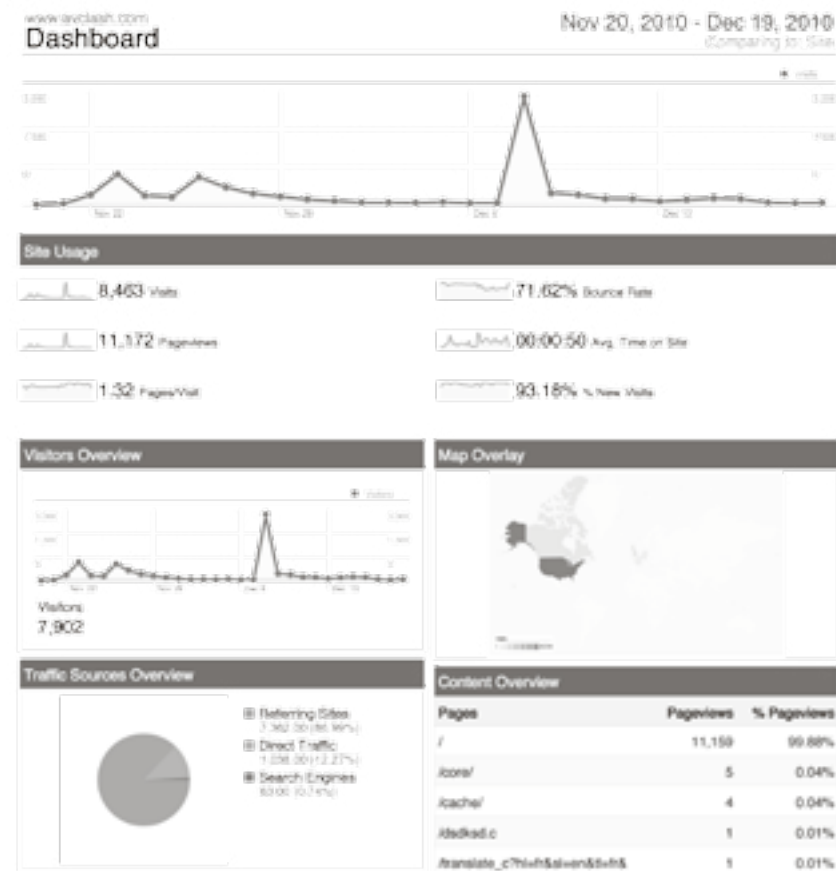


Annex 3

AV Clash web statistics

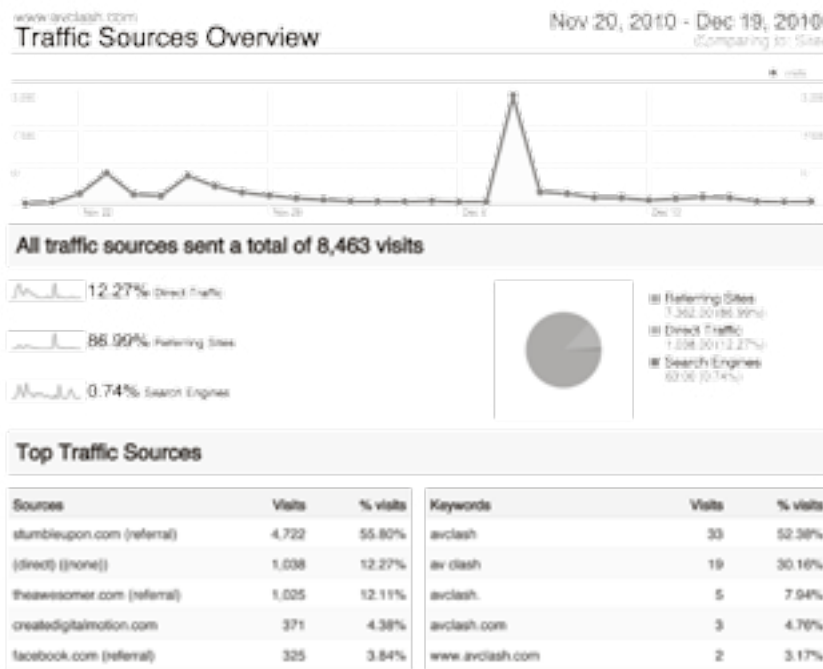
3.1 Visits in the first month

The following graphic is a Google Analytics summary from of the visits in the first month after the project was launched.



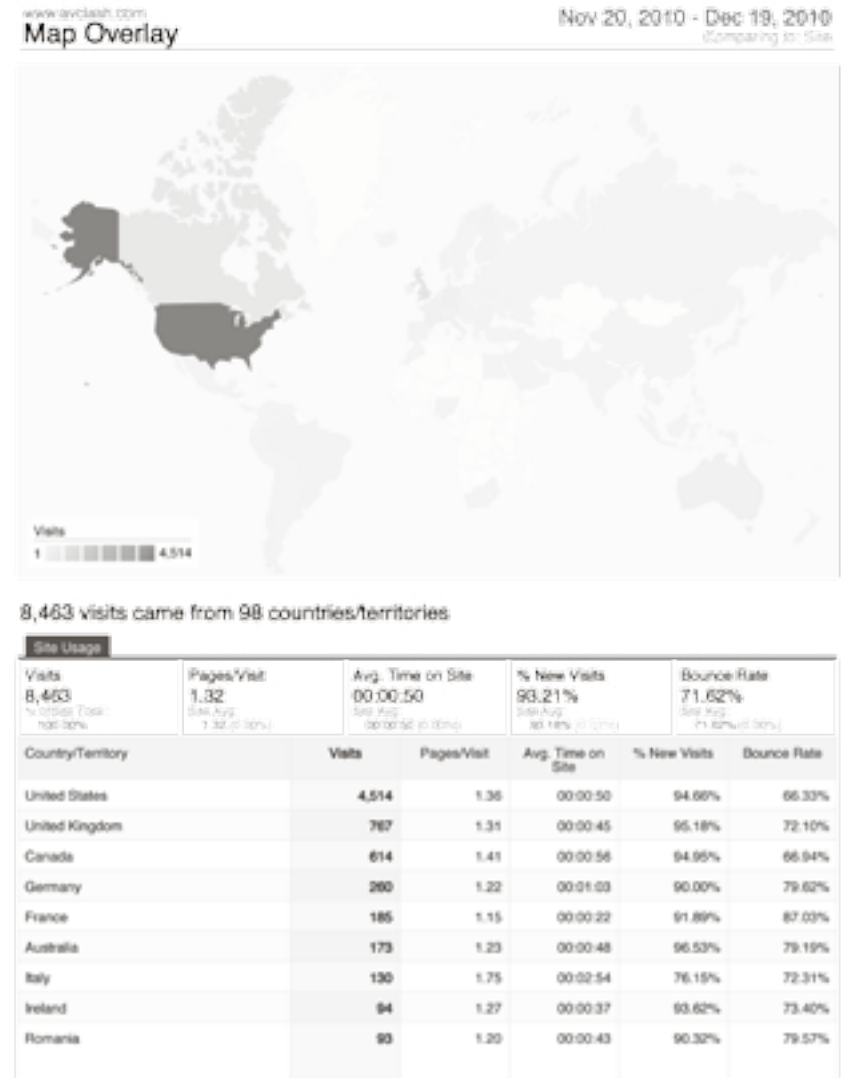
3.2 Traffic sources in the first month

The following graphic shows which ten sites drove the most traffic to *AV Clash* in the first month. It can be seen that the impact from media coverage (The Awesomer, Create Digital Motion, Creative Applications Network and The Creators Project) drove a substantial amount of traffic. Surprisingly, most of the traffic was directed from StumbleUpon (note the peak on December 8th). Promotion through Facebook (via my page, André Carrilho's, and Video Jack's) was also effective.



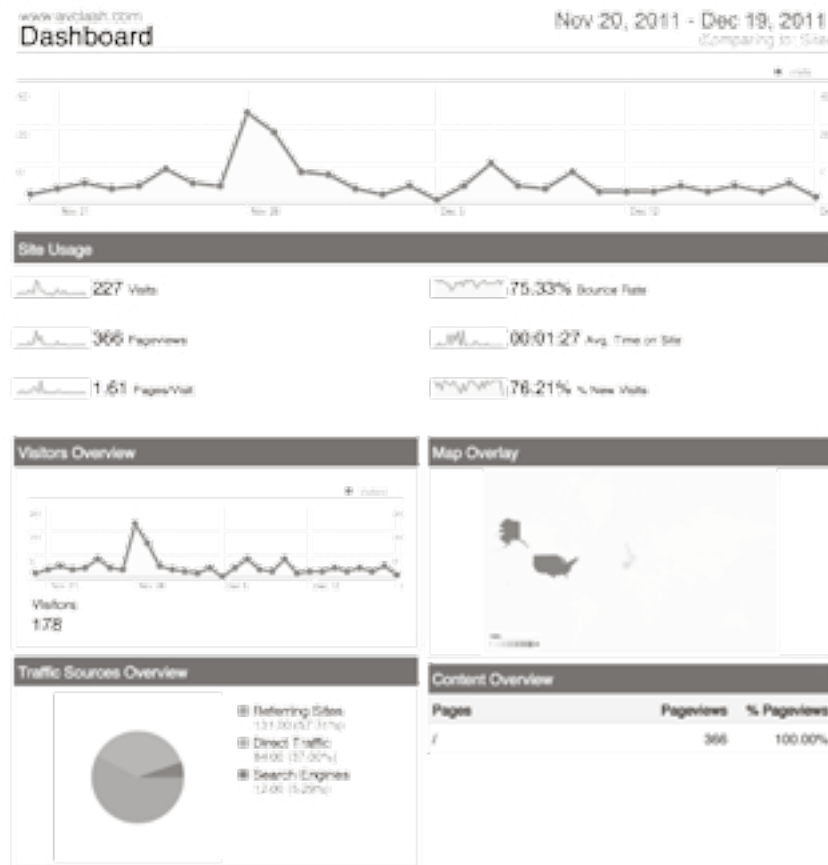
3.3 Country of origin in the first month

The following map reveals that the majority of visits came from the USA, with the second country (United Kingdom) at a large distance.



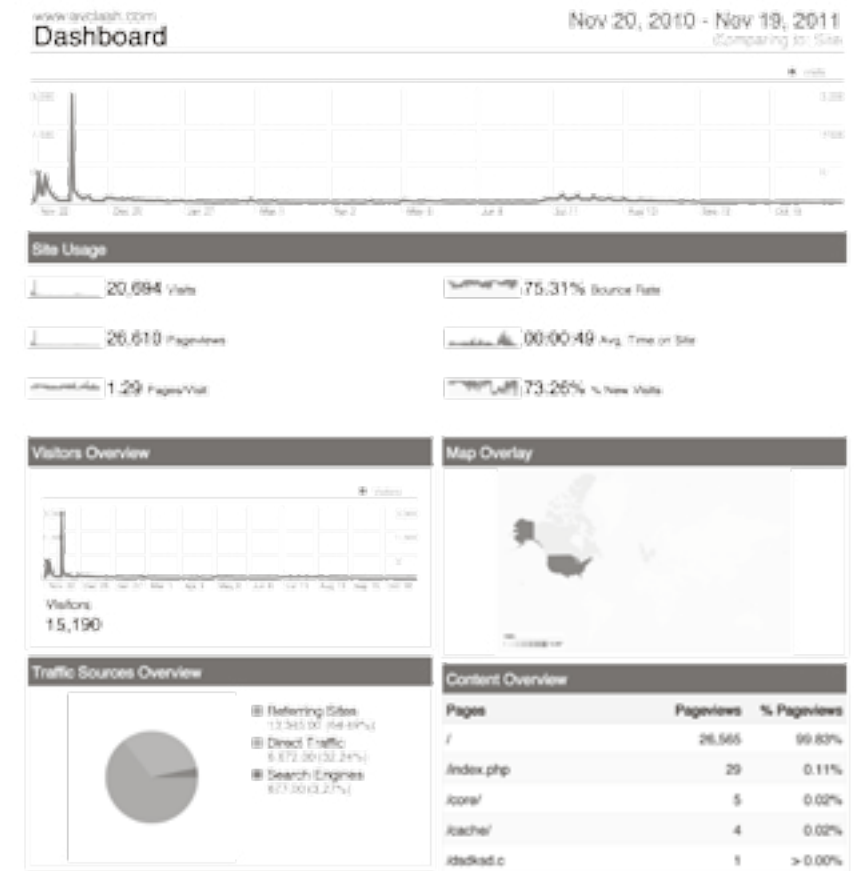
3.4 Monthly visits one year later

The following graphic shows that visits to *AV Clash* have slowed down considerably one year after its launch (227 visits in the 13th month, compared with 8463 visits in the first month). Still, *AV Clash* continues to have a steady amount of visitors per day.



3.5 Visits in the first year

In its first year online, *AV Clash* received more than 20,000 visits.



Annex 4

Questionnaire

The original questionnaire was divided into pages, one per section, which made navigation more usable. It included a header with direct links to each of the projects and a UI diagram (referenced throughout the questionnaire). These elements were now removed to facilitate a print-friendly layout. Google Docs was used to create the questionnaire, although the Google Docs form was embedded in a file within the *AV Clash* server (in the URL <http://www.avclash.com/survey>).

* Required

1. AV Clash - Generic Info (1/7)

1.1 Age *

1.2 Sex *

- Male
 Female

1.3 Country of residence *

1.4 What is your current occupation? *

1.5 What is your educational level? *

Please mark the highest educational stage you have concluded

- Secondary education
 Bachelor degree or equivalent
 Masters degree
 Doctoral degree or higher
 Other:

1.6 Do you / did you work or study in information technology or arts sectors? *

- Yes, in information technology
 Yes, in arts
 Yes, in both
 No

1.7 Do you have experience as musician or DJ? *

- Yes, as musician
 Yes, as DJ
 Yes, as both
 No

1.8 Do you have experience as visual artist or designer? *

- Yes, as visual artist
 Yes, as designer
 Yes, as both
 No

1.9 Do you have experience as new media artist or designer? *

New media is meant here as multimedia / digital media / interactive media

- Yes, as new media artist
 Yes, as designer
 Yes, as both
 No

1.10 Do you have experience as viewer/listener of a new media art project? *

- Yes
 No

1.11 Do you have experience as viewer/listener of a web art project? *

- Yes
 No

1.12 How did you find out about AV Clash? *

- Read about it in the Internet
 Through a friend
 Through one of the authors
 Other:

1.13 How many times have you used AV Clash? *

1.14 On average, how many minutes do you spend per visit to AV Clash? *

2. AV Clash - Sensorial aspects (2/7)

2.1 Do the visuals add (or detract) to your enjoyment of the sound in AV Clash? (compare with image not visible / monitor turned off) *

1 2 3 4 5

Detract very much Add very much

2.2 Does the sound add (or detract) to your enjoyment of the visuals in AV Clash? (compare with sound turned off) *

1 2 3 4 5

Detract very much Add very much

2.3 Do you feel that sound and visuals have equal importance in AV Clash, or is one more important than the other? *

1 2 3 4 5

Sound is much more important Visuals are much more important

2.4 In general, do you feel the visuals are well suited to the sound in AV Clash? *

1 2 3 4 5

They are very badly suited They are very well suited

2.5 Does the connection of visuals with sound limit your imagination, compared to a purely sonic or visual experience? *

- Yes, it limits
 No, it doesn't limit

Comparison and conclusions

Compare AV Clash with:

AVOL - <http://www.videojackstudios.com/avol>

Master and Margarita - <http://www.videojackstudios.com/masterandmargarita>
(functional links on top)

2.6 Which project integrates sound and image better, AV Clash or Master and Margarita? *

- AV Clash
 Master and Margarita
 They are both in the same level regarding this issue

2.7 (If you answered AV Clash or Master and Margarita) Why?

2.8 Which project integrates sound and image better, AV Clash or AVOL? *

- AV Clash
 AVOL
 They are both in the same level regarding this issue

2.9 (If you answered AV Clash or AVOL) Why?

2.10 What are the areas that influence positively or negatively your appreciation of the combination of sound and image in AV Clash? *

Examples: use of color; rhythmical relationship; etc

2.11 In case you have comments related to a specific tag (*), please add them here, pointing out the tag(s) in question

(* Tags identify each of the circular elements/objects in AV Clash, and its name appears when you move the cursor over them: "Drums", "Glitch", "Ambient", etc. There are 12 tags in AV Clash.

2.12 In general, do you find you find appealing the idea of combining visuals and sound in artistic projects? *

- Yes
 No

2.13 (If you answered no) Why?

3. AV Clash - Diversity of content (3/7)

3.1 Were the sounds diverse enough for you to keep interested for a satisfactory amount of time? *

1 2 3 4 5

I lost interest very quickly I would continue playing for much longer

3.2 Were the visuals diverse enough for you to keep interested for a satisfactory amount of time? *

1 2 3 4 5

I lost interest very quickly I would continue playing for much longer

3.3 Would using your own sounds within the project be important for you? *

1 2 3 4 5

Not at all important Very important

3.4 Would using your own visuals (drawings or other images) within the project be important for you? *

1 2 3 4 5

Not at all importan Very important

Comparison and conclusions

Compare AV Clash with:

AVOL - <http://www.videojackstudios.com/avol>

(functional link on top)

3.5 Did you find the possibility of accessing more sounds and visuals in AV Clash appealing, compared with AVOL which has less choice of visuals and sounds? *

1 2 3 4 5

Not at all appealing Very appealing

3.6 Did you spend more time interacting with AV Clash or with AVOL? *

- More time interacting with AV Clash
 More time interacting with AVOL
 Approximately the same time

3.7 (If you answered AV Clash) Why?

(MULTIPLE CHOICE)

- Because of the larger amount of content
 Because of the larger amount of manipulation options
 Other:

4. AV Clash - On the nature of the visuals and sounds (4/7)

4.1 Within each tag (*) in AV Clash, did some sounds appear out of place, out of context with the others? *

(*) Tags identify each of the circular elements/objects in AV Clash, and its name appears when you move the cursor over them: "Drums", "Glitch", "Ambient", etc. There are 12 tags in AV Clash.

Many sounds were out of place with the others The sounds were very homogenous

4.2 Was the overall sound experience pleasant or unpleasant? *

Very unpleasant Very pleasant

4.3 Did the animations of the different tags integrate well with each other, creating a coherent whole? *

Did not integrate with each other at all They integrated very well with each other

4.4 Would you prefer less or more variation of visual style of the animations? *

Much less variation Much more variation

4.5 Would you prefer non-abstract visuals, such as more figurative elements (for example, flowers, planets, animals, objects...)? *

- Yes, I prefer non-abstract
 No, I prefer abstract
 I prefer abstract and non-abstract, mixed

Comparison and conclusions

Compare AV Clash with:

AVOL - <http://www.videojackstudios.com/avol>

Master and Margarita - <http://www.videojackstudios.com/masterandmargarita>
(functional links on top)

4.6 Comparing the different VISUAL approaches of AV Clash and Master and Margarita, which one contributes, in terms of image, to a more enjoyable experience? *

The visuals of Master and Margarita are much more enjoyable
The visuals of AV Clash are much more enjoyable

4.7 (Related to the previous question) Why? *

4.8 Comparing the different SOUND AND MUSIC approaches of AV Clash and AVOL, which one contributes, in terms of sound, to a more enjoyable experience? *

The sound of AVOL is much more enjoyable The sound of AV Clash is much more enjoyable

4.9 (Related to the previous question) Why? *

5. AV Clash - Interactivity (5/7)

5.1 How much do you use the "shuffle" functionality (*) in AV Clash and let the project run automatically / semi-automatically? *

(*) second button on the upper left-corner of AV Clash

I don't use it at all I use it as the main interaction option with the project

5.2 In AV Clash, do you prefer interacting with sounds and manipulating them, or to listen to a sound recording of AV Clash from beginning to end? *

Compare with AV Clash sound recordings, following "sound recordings" link on top, or by accessing: <http://soundcloud.com/video-jack>

I strongly prefer listening to a sound track without interaction
I strongly prefer interacting with the sounds

5.3 In AV Clash, do you prefer visuals, or to watch one video from beginning to end? *

Compare with AV Clash video files, following "video recordings" link on top, or by accessing: <http://vimeo.com/album/1477004>

I strongly prefer listening to a sound track without interaction
I strongly prefer interacting with the sounds

5.4 Is the degree of audio and visual manipulation suitable for you, or would you like more or less options? *

There are too few options There are too many options

5.5 Do you feel that the functionalities of the interface are clear enough? *

They are not clear at all They are very clear

5.6 Does the project behave as you expect, when you interact with it? *

It does not behave at all like I expected It behaves exactly as I expected

5.7 Do you feel that you have control over the project? *

I feel I have no control at all over the project I feel I have total control over the project

5.8 Was it enough for you to explore the interface and discover by yourself, or did you have to read instructions? (accessible by clicking in the logo in the upper-right corner) *

- Yes, it was enough to explore for myself without instructions
 No, I needed to check the instructions
 No, it was not enough just to explore, and I didn't find the instructions

5.9 Do you feel that the integration of the interface (buttons, sliders) with the animations is positive? *

- Yes, integration of the interface with the animations is positive
 No, location of the interface confusing, and the interface should be located somewhere else (away from the animations themselves)
 Indifferent

5.10 Do you like the one screen/one area approach of AV Clash, where all the visuals and interaction takes place? *

Or would you prefer that the interface was split from the audiovisual result (for example, split them into two different screens/areas, one for animation, another for interface)?

- Yes, I like all the visuals and interactive elements are on the same screen and the same area
 No, I would prefer that the interface was split from the visuals
 Indifferent

5.11 Which functionalities of AV Clash did you try? Please check which functionalities you played with: *

(MULTIPLE CHOICE) To see diagram with names of functionalities, please click the "diagram" link on top or go to: <http://www.avclash.com/diagram>

- Track change
 Volume slider
 Effect buttons (echo, filter)
 Effect slider
 Dragging and throwing (by clicking and dragging outside "ring")
 Settings button
 (Settings) > Change tag
 (Settings) > Change sound
 (Settings) > Trim sound
 (Settings) > Change animation
 (Settings) > Reactivity control
 (Settings) > Cycle on/off

Comparison and conclusions

Compare AV Clash with:

AVOL - <http://www.videojackstudios.com/avol>

(functional link on top)

5.12 Comparing to AVOL, are the additional audio manipulation (*) options in AV Clash interesting? *

(*) By "additional manipulation options" it is meant: the audio effects (cyan and magenta buttons, and respective faders) and sound trimming options (sliders over the sound wave image in the object's menu, by pressing the middle button of an object)

1 2 3 4 5

Additional manipulation options are not interesting at all Additional manipulation options are very interesting

5.13 Which is easier / more intuitive to use, AV Clash or AVOL? *

- AV Clash
 AVOL
 They are on the same level regarding intuitiveness

5.14 (Related to the previous question) Why? *

5.15 Comments regarding positive and negative aspects of interactivity to control sound and visuals in AV Clash

Do you see interactivity as interesting in audio or visuals? Do you prefer to experience these media from beginning to end, passively?

6. Experiencing AV Clash (6/7)

6.1 Do you feel creative when playing with AV Clash? *

1 2 3 4 5

No, not at all creative Yes, very creative

6.2 Do you feel that you are creating your own work? *

1 2 3 4 5

No, I don't feel at all that the end result was my creation Yes, I felt it was very much my creation

6.3 Do you feel that you are performing (even if you don't have an audience)? Or at least rehearsing for a performance? *

1 2 3 4 5

No, I didn't feel I was performing at all Yes, I felt very much I was performing

6.4 Did you have fun? *

1 2 3 4 5

No, I didn't have fun at all Yes, I had a lot of fun

Comparison and conclusions

Compare AV Clash with:

AVOL - <http://www.videojackstudios.com/avol>

(functional link on top)

6.5 Which project gives you a higher feeling of creativity? AV Clash, AVOL, none *

- AV Clash
 AVOL
 They both gave me the same feeling of creativity
 I didn't get any feeling of creativity from either

6.6 (Related to the previous question) Why? *

6.7 In a few words, how would you describe/qualify the experience of playing with AV Clash? *

6.8 Would you use AV Clash again? *

- Yes
 No

6.9 (Related to previous question) If not, why not?

7. AV Clash - Suggestions for future developments (7/7)

7.1 To save and load your own options (favorite sounds, sounds playing, volume and effect settings)? *

1 2 3 4 5

Not important at all Very important

7.2 Record what you have done in AV Clash (a session)? *

1 2 3 4 5

Not important at all Very important

7.3 Share these recordings, by e-mail or social networks? *

1 2 3 4 5

Not important at all Very important

7.4 Have sound input and sound recording? *

1 2 3 4 5

Not important at all Very important

7.5 Customize the visuals, as audio is customizable in AV Clash (loaded from an external database), or draw? *

1 2 3 4 5

Not important at all Very important

7.6 Have more sound and visual manipulation capabilities (for example, more effects, for audio and visuals)? *

1 2 3 4 5

Not important at all Very important

7.7 Have more tags (*), besides the 12 existent ones? *

(*) Tags identify each of the circular elements/objects in AV Clash, and its name appears when you move the cursor over them: "Drums", "Glitch", "Ambient", etc. There are 12 tags in AV Clash.

1 2 3 4 5

Not important at all important

7.8 Play with other users (each manipulating different objects) in the same session of AV Clash? *

1 2 3 4 5

Not important at all Very important

7.9 Have more "automatic" playing / generative functionalities for projects, that would reduce the need for interaction (for example, a more advanced and more change-inducing shuffle functionality)? *

1 2 3 4 5

Not important at all Very important

7.10 Use AV Clash in other platforms (game consoles, mobile devices, etc)? *

1 2 3 4 5

Not important at all Very important

7.11 Play with AV Clash in a larger installation, in a public space, controllable with gestures, for example? *

1 2 3 4 5

Not important at all Very important

7.12 Other suggestions for future developments

Problems with the questionnaire?

7.13 Please report any problems you found filling in the questionnaire here, together with the relevant question number (if applicable).

Annex 5

Summary of the answers to the questionnaire

5.1 Answers to close-ended questions

1.1 Age

33 35 31 50 29 30 52 30 33 39 28 31 52 33 36 39 35 31 35 27 35 45

1.2 Sex



1.3 Country of residence

Finland Finland Finland Finland Finland Finland Finland Finland Finland Finland Finland germany Finland Finland Denmark Estonia Finland Lithuania Sri Lanka

1.4 What is your current occupation?

Video designer teacher Researcher office rat Student Researcher Project manager researcher/developer student/entrepreneur Doctoral student Student artist Project manager researcher Self Employed Researcher Student ...

1.5 What is your educational level?



1.6 Do you / did you work or study in information technology or arts sectors?



1.7 Do you have experience as musician or DJ?



1.8 Do you have experience as visual artist or designer?



1.9 Do you have experience as new media artist or designer?



1.10 Do you have experience as viewer/listener of a new media art project?



1.11 Do you have experience as viewer/listener of a web art project?



1.12 How did you find out about AV Clash?



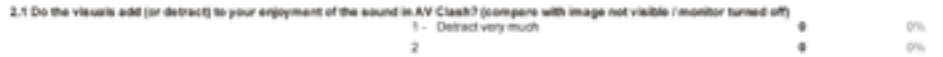
1.13 How many times have you used AV Clash?

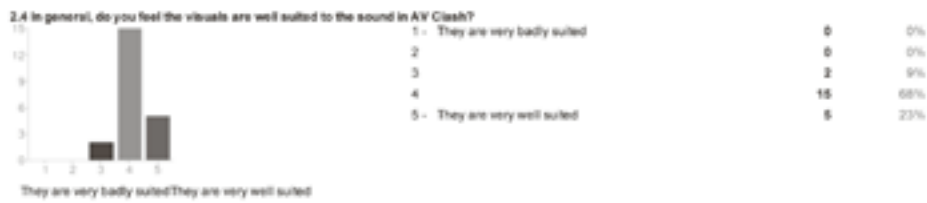
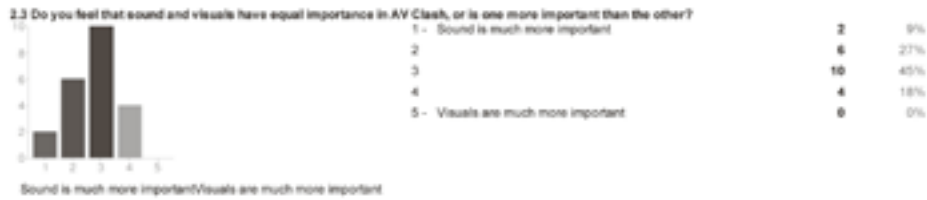
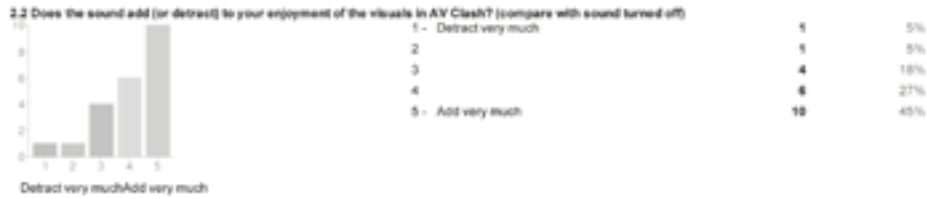
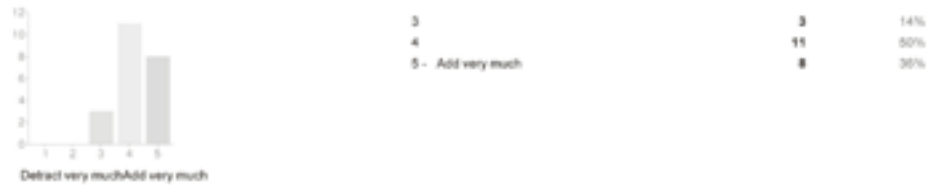
1 1 2 1 1 one 7 2 1 1 2 2 a few three times 2 1 only once so far 5 1 3/4/2011 3 2

1.14 On average, how many minutes do you spend per visit to AV Clash?

5 15 30 15 3 10 10 5 3 10 15 10 15 mins 5 minutes 5 60 15 10 5 10/20/011 10 15

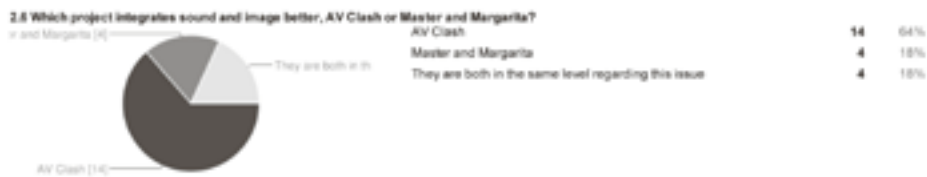
2. AV Clash - Sensorial aspects (2/7)





Comparison and conclusions

Compare AV Clash with AVOL - <http://www.videojackstudios.com/avol> Master and Margarita - <http://www.videojackstudios.com/masterandmargarita> (functional links on top)



2.7 (If you answered AV Clash or Master and Margarita) Why?

(please check section 2 of this annex - answers to open-ended questions, page 233)



2.9 (If you answered AV Clash or AVOL) Why?

(please check section 2 of this annex - answers to open-ended questions, page 233)

2.10 What are the areas that influence positively or negatively your appreciation of the combination of sound and image in AV Clash?

(please check section 2 of this annex - answers to open-ended questions, page 234)

2.11 In case you have comments related to a specific tag (*), please add them here, pointing out the tag(s) in question

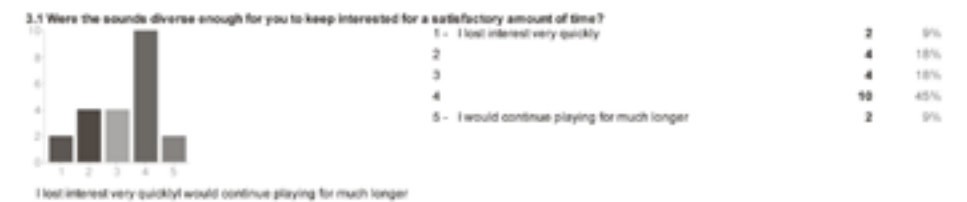
(please check section 2 of this annex - answers to open-ended questions, page 235)



2.13 (If you answered no) Why?

(please check section 2 of this annex - answers to open-ended questions, page 236)

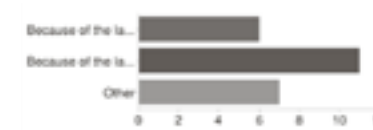
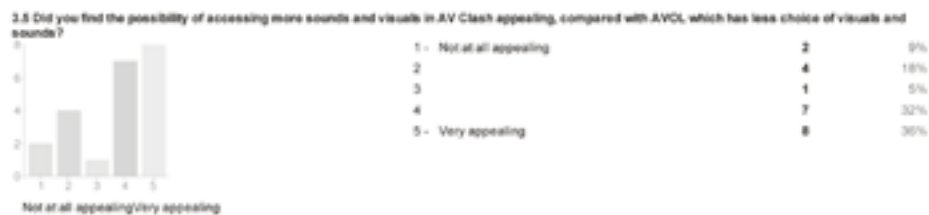
3. AV Clash - Diversity of content (3/7)



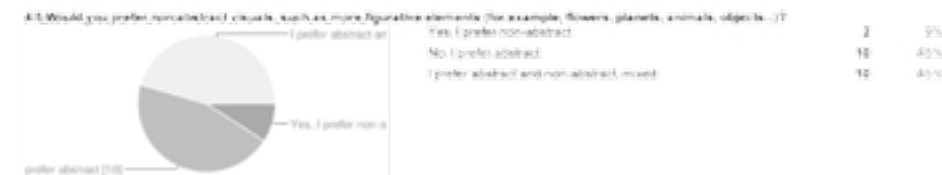
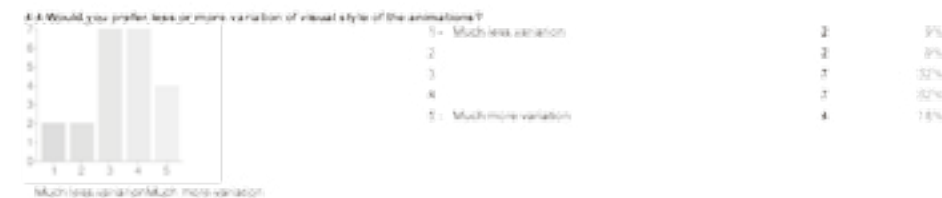
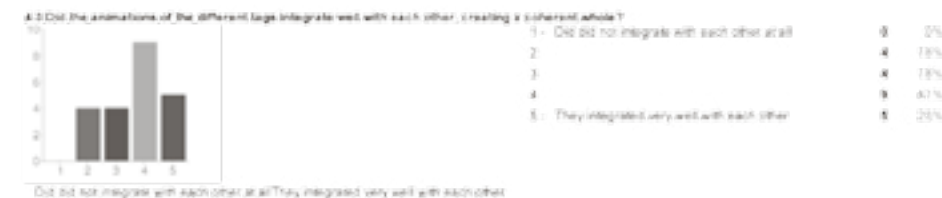
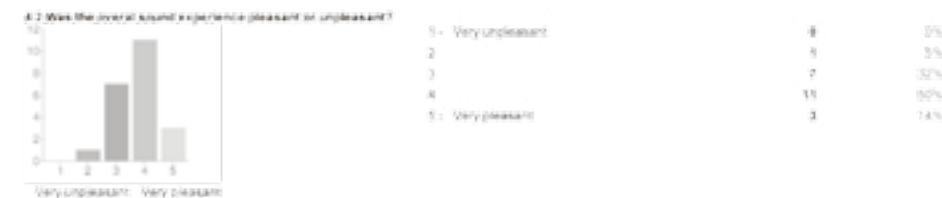
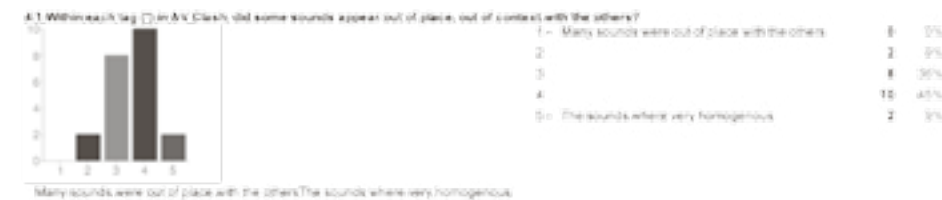


Comparison and conclusions

Compare AV Clash with AVOL - <http://www.videojackets.com/avol/> (functional link on top)



4. AV Clash - On the nature of the visuals and sounds (47)



Comparison and conclusions

Compare AV Clash with AVOL - <http://www.videojackets.com/avol/> Master and Margarita - <http://www.videojackets.com/masterandmargarita/> (functional links on top)

4.6 Comparing the different VISUAL approaches of AV Clash and Master and Margarita, which one contributes, in terms of image, to a more enjoyable experience?



4.7 (Related to the previous question) Why?

(please check section 2 of this annex - answers to open-ended questions, page 236)

4.8 Comparing the different SOUND AND MUSIC approaches of AV Clash and AVOL, which one contributes, in terms of sound, to a more enjoyable experience?



4.9 (Related to the previous question) Why?

(please check section 2 of this annex - answers to open-ended questions, page 237)

5. AV Clash - Interactivity (5/7)

5.1 How much do you use the "shuffle" functionality (⌘) in AV Clash and let the project run automatically / semi-automatically?



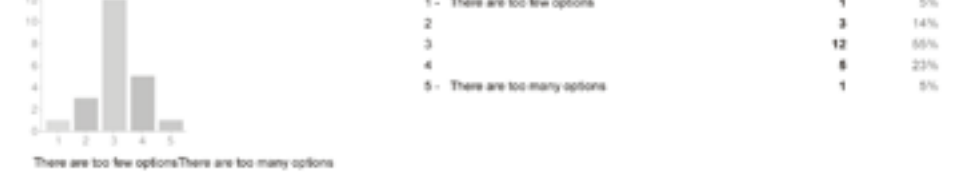
5.2 In AV Clash, do you prefer interacting with sounds and manipulating them, or to listen to a sound recording of AV Clash from beginning to end?



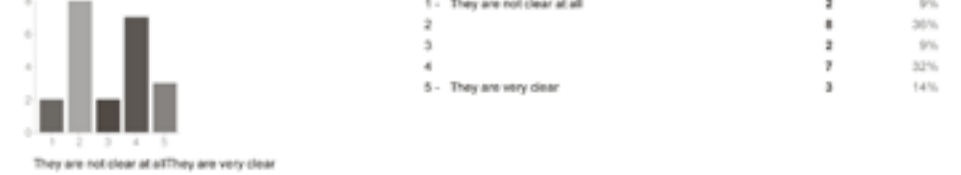
5.3 In AV Clash, do you prefer visuals, or to watch one video from beginning to end?



5.4 Is the degree of audio and visual manipulation suitable for you, or would you like more or less options?



5.5 Do you feel that the functionalities of the interface are clear enough?



5.6 Does the project behave as you expect, when you interact with it?



5.7 Do you feel that you have control over the project?



5.8 Was it enough for you to explore the interface and discover by yourself, or did you have to read instructions? (accessible by clicking in the logo in the upper-right corner)



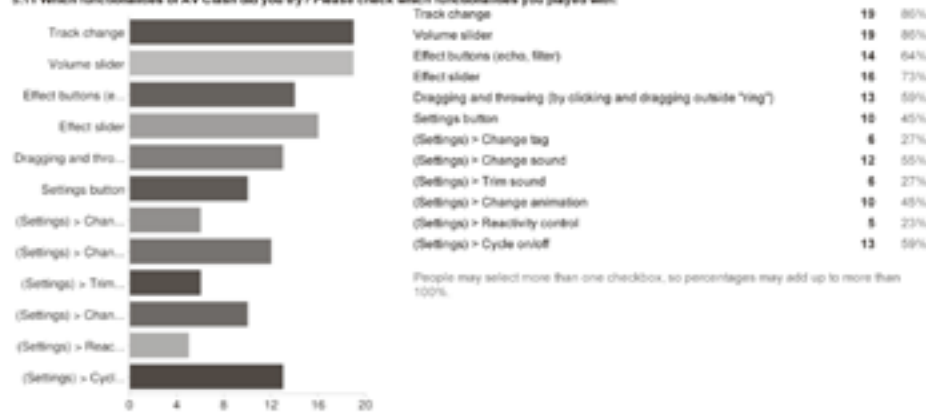
5.8 Do you feel that the integration of the interface (buttons, sliders) with the animations is positive?



5.10 Do you like the one screen/one area approach of AV Clash, where all the visuals and interaction takes place?



5.11 Which functionalities of AV Clash did you try? Please check which functionalities you played with:



Comparison and conclusions

Compare AV Clash with: AVOL - <http://www.videojackstudios.com/avol/> (functional link on top)

5.12 Comparing to AVOL, are the additional audio manipulation (?) options in AV Clash interesting?



5.13 Which is easier / more intuitive to use, AV Clash or AVOL?



5.14 (Related to the previous question) Why?

(please check section 2 of this annex - answers to open-ended questions, page 237)

5.15 Comments regarding positive and negative aspects of interactivity to control sound and visuals in AV Clash

(please check section 2 of this annex - answers to open-ended questions, page 238)

6. Experiencing AV Clash (5/7)

6.1 Do you feel creative when playing with AV Clash?



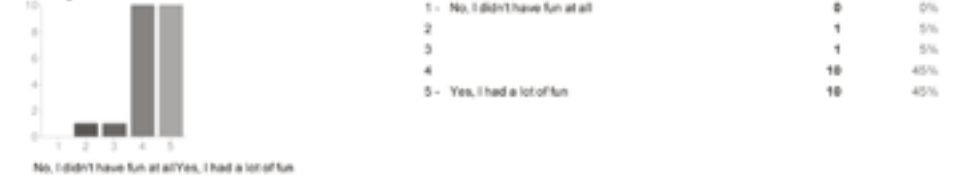
6.2 Do you feel that you are creating your own work?



6.3 Do you feel that you are performing (even if you don't have an audience)? Or at least rehearsing for a performance?



6.4 Did you have fun?



Comparison and conclusions

Compare AV Clash with: AVOL - <http://www.videojackstudios.com/avol/> (functional link on top)



6.6 (Related to the previous question) Why?

(please check section 2 of this annex - answers to open-ended questions, page 238)

6.7 In a few words, how would you describe/qualify the experience of playing with AV Clash?

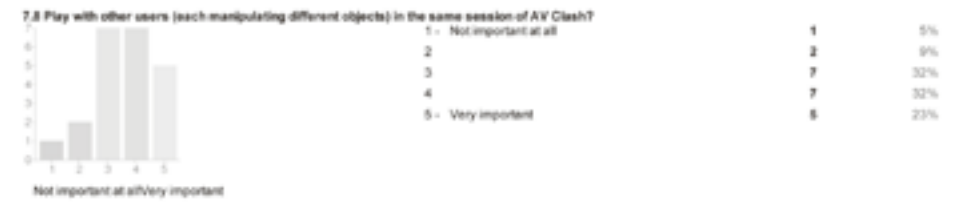
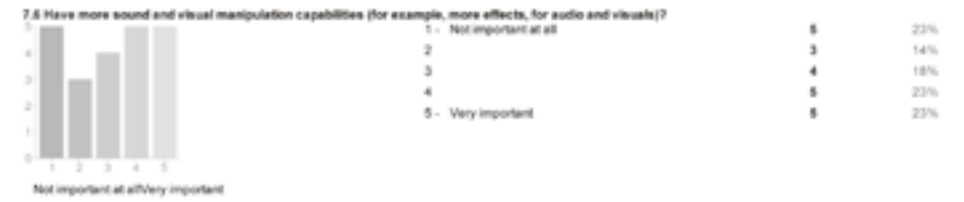
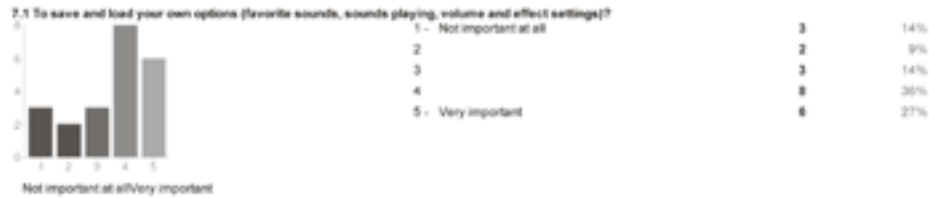
(please check section 2 of this annex - answers to open-ended questions, page 239)

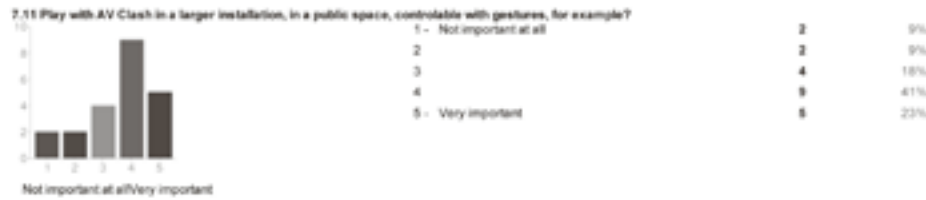


6.9 (Related to previous question) If not, why not?

(please check section 2 of this annex - answers to open-ended questions, page 240)

7. AV Clash - Suggestions for future developments (7/7)





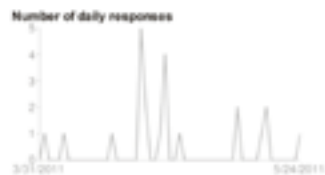
7.12 Other suggestions for future developments

(please check section 2 of this annex - answers to open-ended questions, page 240)

Problems with the questionnaire?

7.13 Please report any problems you found filling in the questionnaire here, together with the relevant question number (if applicable).

(please check section 2 of this annex - answers to open-ended questions, page 241)



5.2 Answers to open-ended questions

2.6 Which project integrates sound and image better, AV Clash or Master and Margarita?

2.7 (If you answered AV Clash or Master and Margarita) Why?

They are both in the same level regarding this issue
AV Clash
AV Clash

There is a clear link between the two. In M&M a rather arbitrary connection. Cause AVClash is more an integrated system, it seems to be thought more into the direction of having an audiovisual experience, than a visual accompanied with sound (effects) as it is in M+M
Master and Margarita Because they are icons that come to represent the sound, instead of patterns reacting differently to sounds.
I like the dynamism and free flow in AV clash

AV Clash
They are both in the same level regarding this issue
AV Clash
AV Clash
AV Clash

The relation between visuals and audio is more obscure in Master and Margarita. margaritas visuals have no sense although they look like they would
Somehow the visual format of AV Clash seems more organic. For example, the fact that there is no visual grid allows the visuals to integrate together more easily, in my view.
Master and Margarita The visual accompaniment to the sound is simpler and this seems to work well.

They are both in the same level regarding this issue
AV Clash

the rhythm of visuals and sounds match more exact in AV Clash.
It was very exciting when the objects meet and produce different visuals and sound.

AV Clash

M&M seems much more complex, which makes it hard to enjoy it on a whim (essential requirement for web interaction). M&M's interface is also slightly confusing.

Master and Margarita

Perhaps because I did not quite understand how it worked, it had an element of randomness about it that made "me" do/see stuff I did not plan myself and I like the grid!
and since Master and Margerita is more an art piece than a tool(in my eyes), I feel a better link between sound and vision. where AV clash seem to feature more generic sounds and visuals... M&M have more edge

AV Clash

Clach was leaier to manipulate. I finaly understood what to do. In Master and Margarita it was bit messy.

They are both in the same level regarding this issue
AV Clash
AV Clash

AV Clashed looks more neutral.
Alas, a boring answer here.
It depends..

I think the connection, from a passive viewer's perspective, between audio and visual sense is closer in Master and Margarita because it seems the audio was more designed with a particular narrative - including the visuals for it - in mind.

And I think the connection, from an active user's/viewer's point of view, between aaudio and visuals is closer in AV Clash, since I feel there's much closer mapping between interacting with the interface and producing particular sounds. That is, one quickly gets a sense from the AV Clash interface, of what actions produce which sounds. Thus the creative experiene is a bit easier.

I might have explored Master & Margarita too little, but getting the hang of the interface takes somewhat more effort, than for AV Clash.

Master and Margarita
AV Clash

the visuals give more context to the sound
M+M's narrative structure is interesting (possibility to choose any thematic area at any time), but once you are in the area, the narrative seems to loose structure.
The interaction and variability of the flying saucer controllers in AV Clash is interesting (especially when you set them into independent motion).

AV Clash

I liked the abstract nature of AV Clash better

2.8 Which project integrates sound and image better, AV Clash or AVOL?

2.9 (If you answered AV Clash or AVOL) Why?

They are both in the same level regarding this issue
They are both in the same level regarding this issue

They look pretty much the same

AVOL	Just a gut feeling...
AV Clash	Av Clash logic is easier to understand
AVOL	They are more restrained, which works with the audio.
They are both in the same level regarding this issue	
They are both in the same level regarding this issue	
They are both in the same level regarding this issue	
AVOL	simpler
AV Clash	Somehow the visual format of AV Clash seems more organic. For example, the fact that there is no visual grid allows the visuals to integrate together more easily, in my view.
AVOL	The connection again with the sound is more simple and more obvious.
AV Clash	av clash is easier to understand and the interface feels more coherent.
AV Clash	The reasons are the same than in earlier. The feeling is that the beat matches better in AV Clash.
AV Clash	Bouncing bubbles with buttons that resemble a mixer work better than the rather abstract icons of M&M.
AV Clash	it seems like the little editor makes it possible to tweak the sound more, thus increasing the the palette of sounds possible
AVOL	Maibe because the outcome of the Avol was nicer (both sound and animation). Clach has 2 different options how t change the sound. It was confusing in the beginning. AVOL is more simple.
AVOL	AVOL in general was more appealing to me. I enjoyed the combination of visuals and sound.
AV Clash	AV Clash looks more like an evolution of AVOL.
AV Clash	Again, my answer is the same as for question 2.7 . The interface is considerably - at least for little old me - easier to comprehend in AV Clash. What I found to help make the interface more comprehensible, are the following aspects: The reduction of interface elements, The more immediate and clear feedback from interface interactions, and the addition of text labels, explaining what different interface elements do. The mapping between interface elements and the feedback the give, i find, is important when making an instrument/tool. Again, perhaps I'm very slow, but the clarity of the consequence to various actions, was somewhat unclear in the projects preceding AV Clash. With AV Clash, I feel things work quite ok. It is quite clear what different actions do, after one has tried them once or thereabouts.
They are both in the same level regarding this issue	
AV Clash	Sorry, I remember I used AVOL once before + liked it. But now I'm forgetting exactly what it looks like and it is loading too slowly at the moment, so can't include any comments for this survey.
AV Clash	more sounds, fx and animations to choose from, multiple moving objects. Animations felt more reactive to the audio. However, AVOL has the edge of being tempo-synced, and better suited for my laptop in terms of CPU load.

2.10 What are the areas that influence positively or negatively your appreciation of the combination of sound and image in AV Clash?

The scaling versus sound volume levels work really well.
The symbolic link between any particular sound and image seem very well suited.
The thing what I feel after playing a while is a sort of repetitive nature of the visualizations, in the circular form. It could be disturbed at some points
+ Clear, recognizable mapping of sound events to visual change
+ Different sound sources look Different
- Gets repetitive without active interaction
rhythmical relationship, size according to amplitude
Can't see how much stuff is in there - you just go on and find things. This is mostly positive, partly not.
I appreciate the limited vector style in your project, but I don't think that I would perform with it, since it is so limited and distinct.
Use of movement and rotations
rythmical relationship
It's a bit difficult to grasp what all the controls actually do.
n/a
Color combination and rhythmical relationship. Rhythmical structure has more influence.
I really wasn't that focused on the visuals, I was more concerned with how to compose something and trying to figure out that interaction, perhaps with more usage I would start to appreciate the use of the visuals but I was too focused on

the compositional possibilities and I didn't, or at least I don't think I did, use the visuals to help me do this.

style of the visuals is very vector-arty, constructed, thus a bit too technical. also somewhat old-fashioned.

The positive is that the rhythm and the animation do match perfectly. Also the the form of graphics do fit well with the sound.

In general the floating bubbles are a good idea for representing independent sample objects, but the relationship between the forms of these objects with the samples contained by them is not very clear. Does it stem from the audiowave images or somewhere else? As a user, I relate the sounds much more to their symbolic origins (i.e. the sea from the ocean sounds etc.).

I like that I can change the loops in AV clash (perhaps I could in the others too, I didn't figure it out though) and Amen break :)

flash is seemingly not the best sample player when it comes to adjusting the loop-points, where a consistent loop is not possible (very short loops don't end in a consistent "tone")

I have a little difficulty placing AV-clash, I think I will end up defining it as online art. as such it is nice.

If not art, it is close to an online toy such as Infinite wheels dub selector: <http://www.infinetwheel.com/dubselector8.html>

If it is to be considered a tool for music, I would consider the sonic and visual possibilities too limited, it is too difficult to tweak the sound and look to my taste.

online, burnstudios audiotool does a better job of creating VERY tweakable sound <http://burn-studios.audiotool.com> but has not option for tweaking visuals.

So basically I don't think I am the intended audience for AV clash
not negative

The way how different visuals worked together is very alluring, tempting, hypnotising and just simply beautiful.

Colours, graphical shapes, ambient sounds.

the graphics have a fun playful quality to them.

they combine certain elements of being very technical, yet also being very soft and cuddly :)

makes them fit well with much music.

perhaps also the repetitive nature of them, and the semi-random quality to their movements/pulses, also help.

the movement of the image in the rhythm of sound helps to create that connection, colors are also very interesting - create the playfulness

positive: random motion; inability to totally control the objects (sometimes tricky to catch them when they are floating); color choices; design of interactive components of the disks

negative: sometimes when mini audio players of the objects is in grid format and you hover over the center of the disk, the type from the disk layer shows through and blurs the type on the audio player grid layer

positive:

+ different animations for different tags

+ possibility to influence sensitivity and to add audio fx

+ moving objects and collisions

negative:

- tempo sync between samples, delay was not tempo synced (might be difficult though)

- did the audio fx have an effect on animations ?

2.11 In case you have comments related to a specific tag (*), please add them here, pointing out the tag(s) in question

I did not pay much attention to the tags, just focused on doing something
It was not possible to reach all the tags... some sort of weird error in the script, I guess... (the avclash tag e.g. was too high up to reach with the cursor, the menu just disappeared). Some of the tags were too unspecific...

Tags were fine but the menus were a little difficult to use, the scroll bar doesn't work so well for me on safari and the text is tiny!

Nice that real world audio elements are included in Field Recording and Voice objects (although similar sounds are also found in other objects like Electronic).

2.12 In general, do you find you find appealing the idea of combining visuals and sound in artistic projects?

2.13 (If you answered no) Why?

But... I think that directing dance party energy in one direction to one screen is limiting. We should think about 360° visuals with surround sound.

Lools like a "normal" future in entertainment.
Well, it depends on the context.
Some audio/visual work better when only one of the two is there. Meditative and contemplative work might genres where this is more often the case.
Some work better when the two are there together.

I would suppose, as we, in a 'natural state' take in both audio and vision at the same time, it would seem there's more often the case a good reason to combine audio and visuals.

4.6 Comparing the different VISUAL approaches of AV Clash and Master and Margarita, which one contributes, in terms of image, to a more enjoyable experience?

4.7 (Related to the previous question) Why?

- 2 I like the variation of material and narrativity. The visual style is distinct and original in the Master and Margarita.
- 3 They look pretty similar
- 5 hmmm
- 4 ?
- 2 I didn't play with avclash enough to get the motion interaction.
- 4 They are more malleable in a way, free flowing
- 4 I like abstract figures, 'cause the music and the image play together well
- 3 I think the overall visual style is pretty similar.
- 5 margaritas visuals do not have a reason
- 2 It's hard to choose. Each set of visuals creates a different ambiance. The Master Margarita visuals made me want to dance, for some reason.
They seemed more conducive to bodily movement. The AV Clash visuals to me seemed more meditative.
- 2 They are just more fun, AV clash is more serious, but that doesnt mean fun is better.
- 1 it stirs my imagination / fantasy much more than just technical interface elements.
- 4 May be because of the abstract sounds. It would be very difficult to put other than abstract visuals, if not trying to avoke certain feeling, like for example ambient sound when seeing pictures from space ship.
- 4 The visual style is slightly more consistent, although I would prefer in both a bit less detail. It's perhaps just my style, but too tiny details on a computer screen are quite tiring for my eyes.
- 1 as previously stated, the less understandable and less predictable behavior of the elements in M&M makes it more interesting to watch
- 5 Clach was more simple to use.
- 5 I just didn't like the symbols at all.
- 4 They are more abstract and neutral.
- 2 This is more of a genre answer.
I feel that Master and Margarita did something for visual performance/live cinema, that few others had managed. Namely to use iconic depictions - if in a cartoonish manner - that can be manipulated variously, for visual-narrative purposes.
Adding to the previous sentence, the visual elements themselves were also a great interpretation of the novel's content, which made them outstanding in themselves. That they can be manipulated, live, for dramatic-narrative effects, just adds to the punch.
- Comparing the two works is like asking which of two genres is the better one. I feel the two belong to two different sub-genres of the a/v performance field. in either genre, they're great.
However, privately, I like Master and Margarita more, as it did perhaps more to expand the visual performance scene than AV Clash.
- 1 M&M somehow tells the story.
i like both, but when i have to choose - M&M is nicer, and more interesting to play around with.
- 5 Although I really liked some of the visuals in M+M, overall they did not seem very original and harmonious (or even make a strong inharmonious impact).
I remember one that was kind of a transparent gradient that seemed particularly out of place.
- 5 I liked the abstract thing more, it leaves space for imagination

4.9 (Related to the previous question) Why?

- 4 AV Clash had more variety. I think also the better usability of AV Clash affects the perception of the overall image, meaning the sound in general.
- 3 It's easier to get a better harmony with a pre-selected set, but on the other hand the variety is more interesting
- 2 beat-synced always feels better at first...
Too less control possibility (at least that I found) in AVClash to actually control fades, etc...
- 4 ?
- 2 A curated starting place.
- 3 I have no opinion on that
- 3 i liked both pretty much the same
- 2 Avol is more instrumental.
- 3 n/a
- 2 Both are equally enjoyable. But AVOL to me was more stimulating, in terms of audio. Percussive elements I enjoyed.
- 4 More choice and control
- 5 Wider spetrum of sounds, once again more space for imagination.
- 5 I found the sounds in AVOL rather monotonous and that's why it very soon came dull.
- 2 I think they are quite similar, but for some reason AVOL works better together. I like both of them for their combination of laid-back ambient and strange samples.
- 4 Amen Break and editing
- 1 Avol was even more simple to use.
- 5 It is the combination of all elements.
- 5 They are more abstract and neutral.
- 3 again, I'm afraid it's the same answer as the previous question.
i feel the two works are in different genres, and do very well in either one.
- 2 combination of sounds reminded me of Radiohead and Moderat, i even left the music play for some time. I would like to have a recording option, just in case something nice would turn out from playing around with AVOL (or AV CLASH)
- 5 AVOL froze while loading.
- 3 This depends on the genre / tags: for rhythmic stuff AVOL is better with its sync, but for ambient / rubato / sound fx AV Clash is better. It has more content, and audio fx. The audio fx could be made parametrized though, eg. set delay time/ feedback, or filter steepness/amount of resonance.

5.13 Which is easier / more intuitive to use, AV Clash or AVOL?

5.14 (Related to the previous question) Why?

- AV Clash better ui
- AVOL Less functionality - less confusion
- AVOL more self-explanatory
- AV Clash Depends of one's own personality and experience, I guess.
- They are on the same level regarding intuitiveness ...
- They are on the same level regarding intuitiveness For a non expert like me (no music or DJ/VJ experience at all), they were both equally intuitive
- They are on the same level regarding intuitiveness Wery good, both intuitively playable
- AVOL Just the fact there are less things to manipulate.
- AVOL simpler
- AV Clash The visual configuration of the interface made it more compelling. It was like opening flower petals.
- They are on the same level regarding intuitiveness There is no visually obvious way to use either when you start without instructions. They both operate similarly, you click in very tiny areas and something happens and at least I learned like that using both, click in the little areas that seem clickable and then see what happens.
dont know. feels more intuitive somehow.
- AV Clash In AVOL it was rather difficult to find the on/off switch and then put the animation go around on the screen. However in AV Clash these was found intuitively.
- AVOL Much more simple interface.
- They are on the same level regarding intuitiveness the two are very similar, and the added functionality in AV Clash is relatively intuitively made.
- AVOL less options
- AVOL The whole experience was much more enjoyable
- AV Clash I'm not so deep into AVOL so AV Clash looks more easier.

AV Clash sorry to seem cheap, but I think I answered this question previously. in donald norman's terms, there's better mapping and feedback in AV Clash.

They are on the same level regarding intuitiveness i might have not discovered everything, since i didn't know until now there was a file with directions on how to use the projects in a correct way.. most important, i think, i managed to realize the interconnection of my actions and the sound.

AV Clash AVOL froze while loading.
AVOL AVOL is much simpler. AV Clash opens up fully only after reading instructions

5.15 Comments regarding positive and negative aspects of interactivity to control sound and visuals in AV Clash

took a little while to understand the functionality of different things, but the learning process was pleasant.
Interactivity itself was interesting, but most of the times you just needed to blindly try what each widget would do. At times there was no immediate feedback, so it was hard to tell whether something you did affected the outcome. At times there were changes I didn't initiate.

Interactivity is very positive factor

I like to set up the audio and visuals and then watch it passively.
The controls are a little cryptic even after I saw the diagram above, the nature of the changes in the sound at least, does not seem to bear an obvious relation with the control mechanism. This mainly has to do with the circular sound settings (effects, volume) tool, its a bit confusing, but the visual settings and trimming mechanism is more straight forward.
I believe interactivity is highly supported, but it should be designed to be highly accessible and with a low learning curve. I would also like more game-like and humorous aspects to the interface. I know projects should be compared to each other, but here is a link to an audio interaction game that I enjoyed using for a while (you probably know this already). <http://www.incredibox.fr/>
it is a bit difficult, I generally don't really like interactive art like this, I prefer to either experience skilled performers performing or alternatively for me to keep interest have potential as a tool for my self (I can't make a song or a video with it)

The alternative should be more like a game, and there the game play is perhaps too abstract to be a game(you can't win, no goal).

:)
i loved playing with the project to try producing my own "music", but it is also very interesting to sit back and watch the professional do it
In this digital interface context, it seems interactivity is essential. It is not enjoyable to watch anything from start to finish on a computer screen. And in a performance context, improvisation would be the most interesting element.
I prefer to explore the thing interactively. In the future when people can start adding their own animations (not sure if this is the intention), I wouldn't mind watching them passively. Perhaps a short preview of the full-length playback would then be useful to get the idea of the content.

6.5 Which project gives you a higher feeling of creativity? AV Clash, AVOL, none

6.6 (Related to the previous question) Why?

AV Clash More variety in sound makes it more versatile and feels like my own creation..
AV Clash More control over the outcome made me feel ownership of the piece.
They both gave me the same feeling of creativity the basic concept is very much the same; there focus is on different musical aspects. The tool, though, shapes the sound/vision?
AV Clash ?
They both gave me the same feeling of creativity I guess the interaction isn't clear in the small time I have used it.
AV Clash Mybe because I preferred the visuals and the movement
AV Clash felt like having more options
AV Clash It's less controlled and doesn't force structure.
I didn't get any feeling of creativity from either although it feels chaotic, it is too structured
AV Clash Seems AV Clash interface reveals more creative options.
AV Clash More control equals more creativity.
AV Clash as it feels more intuitive, i also easier get into a flow and forget about the tool itself.
I didn't get any feeling of creativity

from either Well I found it so that I experience your (the real creators') work. The interactivity is part of the work and a tool how the artist invite viewers and listeners for the work. My creativity is only to experience and get enjoyment of your ideas.

They both gave me the same feeling of creativity I like playing with samples, especially when each tweak creates a nice twist to the audio stream.
AV Clash I feel I have some more creative options with the editing of sound clips and visuals
AVOL The outcome of AVOL was more enjoyable. Maybe because of selected sound tracks. They fitted together nicely. And when switching them the it created interesting transactions.
AVOL AVOL in general was more my cup of tea
AV Clash Looks more flexible.
They both gave me the same feeling of creativity i don't think my goal was to do something in specific, but just play around. perhaps i would have felt more creative had i been using either tools several times, with the aim of doing something. having few encounters with either I still felt i was learning them, and felt either had equal opportunity for being creative.
They both gave me the same feeling of creativity i don't strongly distinguish between the two, i think they are rather alike.
AV Clash AVOL never loaded.
AV Clash more options, although I felt like was performing more with AVOL (question 6.3, because of tempo sync)

6.7 In a few words, how would you describe/qualify the experience of playing with AV Clash?

fun
Nice to experiment, hard to get out the exact outcome you want. Some functionality such as "solo" is pretty dramatic, since with only one click you can stop everything else - which you didn't want necessarily.
it's fun :) but also quite bound to how the designers thought about how the sounds/visuals should look like. This is by no means a bad thing, it's just something to mention.
Surprising, creative, high
It is like suddenly finding myself at the controls of a strange starship with no idea how to drive.
fun
fun, will recommend to my dj hubby :)
Fun way to produce random soundscapes.
after getting the hang of it, it loses interest
Quite meditative. I can get into a groove very easily.
Its a good immersive experience to explore the different sounds as there is good choice. I mainly focused on the sound so I will have to try it again with the visuals but in my initial experiences the visuals are secondary.
like a kid playing with a colorful musical toy-instrument - a playful approach to create a fascinating experience
it is fun to find rhythm from the crashes and the beat, the randomness of the sound.
It felt like a fun exploration into the sounds, although it was also slightly alienating since aesthetically the interface seemed to be made more for audio professionals instead of amateur players.
clicking the mouse --> editing only one parameter at the time
er ... home DJ? :)
technical, masculine,
On-line fun which gives you an inspiration to perform with it on-stage.
i think my academic words do the experience of playing with an a/v tool injustice.
i really should brush up on my creative vocabulary.
i'll get back to this after i've taken up reading poetry again, for a while :)
it is a very complicated tool (for me), it's super interesting, but i feel i do not know so much about it, and in order to feel the interactions more time is needed
The AV Clash gadgets are simple and yet surprising. It is relatively easy to get oriented within the logic of the interface, but I never felt completely in control.
This might be the ideal balance for an artistic project. I would be interested to be able to add my own elements. But it might also be equally satisfying if there was a wider variety of elements to choose from (not necessarily a much greater quantity, but rather more of a range).
engaging, fun, opens up a new perspective to freesound

6.8 Would you use AV Clash again?

6.9 (Related to previous question) If not, why not?

Yes
 Yes
 Yes
 Yes
 Yes
 Yes
 My answer is: maybe - I don't usually create music, so this interface was fun and easy, even though I probably did not get all the possibilities it offers. I could use AV Clash to play with my nephews.

Yes
 Yes
 No
 for me too eyecandy and lacks substance. using it i ask my self, why am i doing this, what do i get from this. the idea is intresting, a semi-interactive piece with a interface that u have to learn to use. but why would i want to use it more than initial test.

Yes
 Yes
 Yes
 Yes
 Yes
 Yes
 No
 But I will use AVOL again

Yes
 Yes
 Yes
 Yes
 Yes
 Yes
 Yes
 Yes
 Yes

7.12 Other suggestions for future developments

Faster response times would make the changes more evident. Some indication as to what are the active parts you can click.
 make the buttons bigger. very hard to grasp.
 Try to add explanatory text to the sliders. maybe even add keyboard bindings to different buttons such that they can be triggered by keyboard.
 Maybe add an intro mode (with tooltips and all explanations on) and an expert mode (all off)
 Otherwise, very nice :-)

interaction with movement e.g. dancing, my hubby being dj and daughter dancer
 Chance to use overlay help boxes, that explain interaction.
 the tehcnical idea is interesting, learning to use a "chaotic" instrument. but the reason to use it after u've learnt it, ther isnt one. for me this work doesnt have any "meaning", i ask, why has this been made, what are to experiences the user gets, why would someone come back to this. also, have i seen similar ones before.

so, please think about the content and answer to the question: why is this made?

i believe to make it stand out and really be more than "eyecandy" (sorry for the provocation...) the ideas mentioned at the end are the keys: bring your own sounds/visuals/drawings and take it into the real world - interaction of many in front of a screen, maybe using body gestures. also towards a loop pedal, record ur own sounds live and play them with the visual. try to get it out from the laptop and mouse interface -- manipulate the object of a screen with lasers/shouts/movements etc etc etc.
 Create a version of this for Wii, in which interface is activated by body movement. Would be great fun, I think.

more tactile control, using the mouse easily end up being very limiting, for all the same reasons people use midi controllers.
 I liked the temporary nature of the experiment. Because I'm not an musician I feel no need to record and share my creation. But I would like to share the tool and let others play with it. I think the experience is important. The process. Not the outcome.

Have fun too.
 maintain a good balance between play, clarity of interface, and number of 'features'. play, for the novice, depends, i believe, very much on how well one understands and can manipulate the interface.
 oftentimes more features come at the price of there being a steep and long learning curve to use the interface, and a lack of sense of play with the interface.
 so, less can be more ;) and it's important to keep the balance in mind.

i suppose doing interactive and user studies, is a general help even for designing 'intuitive' things :)
 the recording and sharing i think is very important! also possibility to listen/view the results on the mobile device (iPhone) would be nice.

- xy position can affect more parameters, eg. panning / change looping
- option to use physics when throwing so that the objects ease down after a while
- I liked the direct manipulation (controls on top of the object), but it was difficult to see what the animations looked like. In the global/backstage view, perhaps the controls could be located below the object
- abstract sound synthesis engine + short midi patterns In addition to sample-loops
- possibility to add custom animation / sound synthesis / fx plugins
- (master volume slider)
- when selecting a sound from the list, the preview button could stay pressed

7.13 Please report any problems you found filling in the questionnaire here, together with the relevant question number (if applicable)

Scrolling problem, blank long pages. A few complicated questions or multiple questions combined into one (hard to answer both about sound and visuals with a radio button).

I would have liked more options (not just yes/no)

everything worked really smoothly, thanks!

this questionary is too long, do u really expect people to take one that might take 30 minutes*? not so many i guess

Too many questions.

Some times I want to answer something that is not possible in the choices I have. those questions can quite easily make my replies sound more negative. I really like the project for what it is although I feel a bit outside the target audience.

Mostly fine. In one question there was some repeating inside of the text. Don't remember where. Maybe group 6?