

'Chronovist' conceptualization method: exploring new approaches to structuring narrative in interactive

The Slade School of Fine Art

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**'Chronovist' conceptualisation method:
exploring new approaches to structuring narrative in interactive
immersive audio/visual media.**

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A Thesis submitted for the Degree of Doctor of Philosophy

'Chronovist' conceptualization method: exploring new approaches to structuring narrative in interactive

Declaration.

I, Anna Tchernakova, confirm that the work presented in this thesis is my own. Where information has been derived from other sources, I confirm that this has been indicated in the thesis.

Anna Tchernakova

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Abstract.

This research investigates whether the application of the initially literary concepts of Bakhtin's 'chronotope' and 'utterance' to the field of interactive narrative audio-visual media can lead to the development of new approaches to structuring narratives.

By extending Bakhtin's concepts to the analysis of interactive immersive audio-visual media I analyse interactive immersive cinema as a first-person experience of a chronotope. Further, I propose to approach chronotope as a real physical space or environment and I supplement the concept of chronotope with an architectural concept of Benedikt's isovist, expanding its definition from 'location-specific patterns of visibility' to a general term for calculating the distribution of a certain spatial or temporal attribute from a vantage point throughout the space.

The result is a new conceptualisation tool, which I call 'the dynamic isovist of a chronotope', or a 'chronovist'.

The research discusses the implications of this tool for interactive immersive cinema authorship and shows how it can lead to new narrative paradigms (models). It maps the practical uses of such approaches for interactive authors, as well as for authors migrating to interactive immersive cinema from conventional (non-interactive) filmmaking, and suggests how existing interactive works by other artists can be 'remixed' using the chronovist approach.

Using one of my feature films, 'Dog's Paradise', which was completed while undertaking this research, I analyse narrative devices used in the film that were developed using the chronovist approach and suggest how the film could be further developed as an interactive cinema piece.

The research also suggests how this conceptualisation tool can be extended to other 'genres' of interactive art and what its implications might be for future researchers and interactive authors.

Introduction.

This research began with my interest in the possibilities for audio-visual narrative storytelling provided by interactive media.

There has been a significant gap between professional filmmakers making 'conventional' films - both 'art-house/festival' and 'commercial' - i.e. films destined for public exhibition at cinemas, television broadcast and DVD or digital distribution, and artists experimenting in interactive immersive cinema, which is almost inevitably distributed for a very limited and specific audience. It is not only the distribution that sets these two areas apart. The whole craft of 'conventional' filmmaking from scriptwriting to editing is geared towards telling the most engaging stories in the most efficient and engaging ways. Authors strive to shape and to completely control and manipulate the audience's experience with the piece. Authorship is imposed on every inch of the screen – from the colour of the costumes of background extras to every element of the soundtrack.

It might appear that interactive art challenges the very concept of authorship for the benefit of the viewer's participation with the piece. It is still not uncommon to hear or read that interactive art doesn't aim at telling stories, but has a different purpose - a new experience, an exploration of a created world, collaborative expression and so on. However, a growing body of creative and academic work challenges this assumption and reinstates authorship in interactive art ranging from computer games to interactive installations. Already in 2001 Murray states:

The interactor is not the author of the digital narrative... Authorship in electronic media is procedural... [which] means writing rules by which the texts appear as well as writing the texts themselves... The procedural author creates not just a set of scenes but a world of narrative possibilities...

(Murray, 2001, p.152)

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The very definition of interactivity has also changed and:

...should no longer be defined by a specific formal language prescribed by the vocabulary of the 1990s. Today, most of all, it is a set of strategies that can be situated in multiple contexts.

(Interactive Art Jury statement, Ars Electronica, 2013)

Expanding the above definitions we can say that procedural authorship or 'a set of strategies' defines the rules by which the world described in the interactive text operates and by which it is revealed. Unlike any other artistic text an interactive text requires a reader/player to be actualised, and this actualisation is unique every time.

I will argue therefore that a reader/player inevitably becomes a protagonist ('the chief person in a drama; the principal character')¹ of an interactive text.

The task of this research, undertaken from the point of view of an actively working 'conventional' film director (after having graduated from the State Film Institute in Moscow in 1994, up to date I have completed four theatrically released art-house features, several documentaries, a few short films and an animation) is to investigate new approaches to authorship for interactive narrative audio-visual media and to show that interactive media can provide exciting opportunities for telling audio-visual stories in new ways.

As the theoretical basis of my research I use the concepts developed by the Russian philosopher Mikhail Bakhtin for the analysis of artistic discourse - those of artistic utterance and 'of chronotope'.

Bakhtin insists on a three-part structure of discourse – the author, the utterance and the interlocutor - and its historicity. He states the author's responsibility and answerability for the utterance, and he argues for the non-reiterative nature of artistic utterance and the primacy of 'theme' (or 'content') of the utterance (as a part of 'live-speech') over its reiterative formal elements. Originally developed for the analysis of literary discourse, Bakhtin sketched the possibility of extending these concepts to other types of artistic text and cultural communication. The application of his framework allows interactive

¹ as defined in Brown, L. ed., 2007. *Shorter Oxford English Dictionary*, 6th ed. Oxford: Clarendon Press, p.2386

'Chronovist' conceptualization method: exploring new approaches to structuring narrative in interactive immersive audio/visual media to be placed within a broader context of artistic discourse.

The concept of chronotope was developed by Bakhtin for the analysis of literary texts and the relations between the tempo-spatial structure, the plot and the genre in a novel. However, the properties of an interactive text - which can be defined as a space of possibilities actualised in time by the actions of the reader/player and forming a first-hand experience of the piece - echoes the definition of chronotope by Bakhtin, especially the narrative potential inherent in the text structure. As shown in Bakhtin's analysis of forms of chronotope in literary texts (Bakhtin, 1981) the chronotope is characterised by two main features: (1) altered spatial and temporal characteristics; (2) narrative potentials (chronotope predetermines which events can happen and how). Bakhtin argues that chronotopes are:

the organising centres for the fundamental narrative events of the novel. The chronotope is the place where the knots of narrative are tied and untied. It can be said without qualification that to them belongs the meaning that shapes narrative.

(Bakhtin 1981, page 86)

While there is a small but growing body of academic scholarship applying Bakhtin's ideas to audio-visual media, new media and games (discussed in Chapter 1), this thesis seeks to contribute to this knowledge by demonstrating how Bakhtin's ideas can be developed and used not just as a tool for the analysis of existing artistic texts, interactive or not, but as a conceptualisation method for the inception and creation of new interactive audio-visual texts.

By extending this concept to the analysis of interactive immersive audio-visual media, and by suggesting to approach interactive immersive cinema as a first-person experience of 'chronotope', I describe discourse in interactive immersive cinema as a conversation – or exchange of 'utterances' - between the author and the reader, taking place within a specially created time-space continuum consisting of several fused

'Chronovist' conceptualization method: exploring new approaches to structuring narrative in interactive 'chronotopes'. To empathise this dialogue aspect of the relationship with the author of the text I use the term 'interlocutor'² rather than 'reader' or 'player'.

I further propose to call this time-space continuum an 'environment' and use the architectural concept of 'isovist' first defined by Benedikt (Benedikt, 1979) to describe and to model this environment. I call the proposed novel conceptualisation method 'chronovist'. I argue the 'chronovist' method privileges content over formality, is technology and platform-independent, can use existing or yet-to-be discovered tools, and provides a consistent and systematic strategy for creating an interactive audio-visual piece from inception to production. I further suggest how this method can lead to the development of new narrative models in interactive media.

While I suggest that this framework can be used across many interactive media, from hyper-texts to creating shared trans-media 'story worlds', I concentrate chiefly on audio-visual interactive story-telling, which I will define as 'interactive immersive cinema'.

The research is informed by the analysis of existing interactive art but also by my own practical work - two interactive pieces - *Unified Theory of the Universe*, (2006, 16mm, digital) authored using Korsakov software, and *Monica* (2007, video) authored using Micromedia Director software, experience with writing interactive fiction texts using Inform 7 natural language software - as well as my practical work as a 'conventional' script writer and film director. One of the feature films I made during the years of the research, *Dog's Paradise* (2014, 35mm, Russia, RWS), was developed using the approaches described here.

Chapter 1 discusses Bakhtin's main concepts and gives an overview of the academic research that uses Bakhtin's ideas to discuss narrative in audio-visual media.

Chapter 2 introduces the suggested application of Bakhtin's ideas to interactive immersive media and sketches their application.

Chapter 3 discusses contemporary interactive media relevant for this research.

² from Latin *interloqui* to speak between, 'someone who is involved in dialogue or conversation' according to Cambridge Advanced Learner's Dictionary.

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Chapter 4 looks into existing interactive authoring systems/ concepts and scholarship that deal with interactive narrative construction, analyses them, and argues the need for a new conceptualisation method.

Chapter 5 and Chapter 6 describe how conceptual methods based on Bakhtin's ideas can be applied to interactive narrative design.

Chapter 7 introduces an additional concept - of Isovist - and combines it with chronotope to create a novel conceptualisation method – 'chronovist'.

Chapter 8 analyses how the 'chronovist' conceptualisation method was referred to in the development of a conventional fiction 'Dog's Paradise' and suggests how the project can be developed into an interactive audio-visual piece following the proposed framework.

Chapter 9. The Conclusion discusses other possible practical applications of the novel 'chronovist' method and the types of narratives it can produce. It also outlines possible future research questions and contemplates the role of Bakhtin's ideas in contemporary artistic discourse and summarises the original contribution made to the field by this research.

1. Chapter 1. Bakhtin's concepts of 'chronotope' and 'utterance' and audio-visual media.

Premise.

In my research I use two concepts developed by Mikhail Bakhtin in his studies of literary texts and cultural communication: the theory of 'utterance' and the concept of 'chronotope'. I argue that the application of these concepts leads to the development of a new narrative model and a new practical approach to narrative construction in interactive immersive cinema.

I approach discourse in interactive immersive cinema as a 'non-verbal conversation' – or exchange of 'utterances' - between the author and the interlocutor, taking place within a specially created time-space continuum where the 'chronotope' of the interlocutor for the time of the interaction is fused with the overlying 'chronotope' of the text and its situational 'chronotopes' allowing for these chronotopes to be subjectively and directly experienced in their unique spatio-temporality by the interlocutor.

The suggested approach has a two-fold effect. It allows the analysis of existing works as well as the development of a model of 'ideal' discourse in interactive immersive cinema. It also leads to the development of a practical framework for the creation of new works in the media, suggesting a step-by-step approach for future authors.

1.1. Theoretical grounding.

The theoretical framework used in my research is based on the interpretation of the methodology of human sciences suggested by Mikhail Bakhtin within the body of his work and specifically in the essay entitled 'Toward a Methodology for the Human Sciences', (Bakhtin, 1986 pp.159 – 176), which was the last text that Bakhtin wrote. Before discussing the concepts of 'chronotope' and 'utterance', I need to briefly outline several general ideas underpinning Bakhtin's theoretical framework.

Firstly, Bakhtin states the distinction between the natural sciences and human sciences, insisting that the object of the human sciences is 'man as producer of texts' (Todorov, 1984, p.17). Todorov continues that 'in the natural sciences we seek to know an

'Chronovist' conceptualization method: exploring new approaches to structuring narrative in interactive *object*, but in human ones, a *subject*' (Todorov, 1984, p.18). Bakhtin stresses the difference between the monological form of knowledge present in natural sciences and the dialogical form of knowledge inherent in human sciences:

The exact sciences are a monological form of knowledge: the intellect contemplates a *thing* and speaks of it. Here, there is only one subject, the subject that knows (contemplates) and speaks (utters). In front of him there is only a *voiceless thing*. But the subject as such cannot be perceived or studied as if it were a thing, since it cannot remain a subject if it is voiceless; consequently, there is no knowledge of the subject but dialogical.

(Bakhtin, as cited in: Todorov, 1984, p.18)

The logical consequence of this proposition is Bakhtin's definition of the aims in human sciences research: it is not knowledge, as in natural sciences, but understanding. According to Bakhtin, understanding is active and dialogical (Todorov, 1984, p. 22). Bakhtin describes understanding as:

setting in relation with other texts and as reinterpretation in a new context (mine, that of my epoch, the future's)... True understanding (...) is always historical and personal.

(Todorov, 1984, p. 23; Bakhtin, 1986, p. 161)

He further writes:

Understanding as the transformation of the other's into "one's own/another's". The principle of out-sideness. The complex interrelations of the understood and the understanding subjects, of the created and understanding, and of the creatively rejuvenating chronotopes. The importance of reaching, digging down to the creative nucleus of the personality (in the creative nucleus the personality continues to live, that is, it is immortal).

(Bakhtin, 1986, p. 168)

He describes 'accuracy' in human sciences as consisting of 'overcoming the other's strangeness without assimilating it wholly to oneself' (Todorov, 1984, p. 24; Bakhtin, 1986, p. 168). He also stresses that the 'criterion is not the accuracy of knowledge but

'Chronovist' conceptualization method: exploring new approaches to structuring narrative in interactive the depth of the insight' (Todorov, 1984, p.23), while in natural science accuracy is paramount: 'The limit of accuracy in the natural sciences is identification ($a=a$)' (Todorov, 1984, p. 23; Bakhtin, 1986, p.161).

Once again, Bakhtin firmly separates his position from Formalism, blaming its approach for 'the lack of understanding of historicity and change' and 'ignoring content' (Bakhtin, 1986, p.169), and from Structuralism, arguing against its 'mechanical categories', 'formalization' and 'depersonalization':

In structuralism, there is but one subject: the scholar himself. Things are changed into *notions* (of variable abstraction); but the subject can never become a notion (he speaks and answers for himself). [In reality] meaning is personal: there is always within it a question, an appeal to, and an anticipation of, the answer; there are always two subjects in it (the dialogical minimum).

(Todorov, 1984, p. 21)

Finally, he establishes that the interpretation of artistic discourse:

is forced to go deep into the infinity of symbolic meanings; that is why it cannot become scientific, in the sense of the term in the *exact* sciences. The interpretation of meanings cannot be scientific, but is profoundly cognitive.

(Todorov, 1984, p. 23; Bakhtin, 1986, p.160)

It seems justified therefore that in my analysis of interactive immersive cinema as a 'non-verbal conversation' – or exchange of 'utterances' - between the author and the interlocutor, taking place within a specially created time-space continuum of 'fused chronotopes,' I supplement Bakhtin's theories with the framework developed by cognitive narratology and namely cognitive film studies (Bordwell 1985, Branigan 1992) and Grodal 1997). I also use the studies of cinematic narrative by Grodal (Grodal, 1997, 2009), Bordwell (Bordwell, 1985, 1989, 2002, 2007) and Branigan (Branigan, 1992, 2006) in my analysis of image and montage as components of interactive immersive cinema.

1.1.1. Bakhtin's theory of 'utterance'.

Description of the concept.

Bakhtin's notion of 'utterance' can be traced back to what Saussure called the 'parole' aspect of language, but 'made specifically social, historical, concrete and dialogized' (Bakhtin, 1981, p. 433). Bakhtin defines 'utterance' as a basic unit of communication, ranging from a single non-verbal sound or gesture to a full-length novel, produced by an individual subject (author) in response to and in anticipation of other utterances by other, real or imagined, specific communicating subjects (interlocutors). His theory of 'utterance' in literary discourse (Bakhtin 1978, p. 249-255) can be summarised in the following way:

- artistic discourse is always composed of utterances;
- utterance has two parts: a reiterative part defined by 'basic artistic material' and a non-reiterative, unique part, which is: the speaker, the space and time of the utterance, the object and the relation of the interlocutor ('the utterance as nonreiterative whole, historically unique and individual' (Bakhtin, in Todorov, 1984, p. 26));
- utterance is *limited* - the boundaries of each concrete utterance 'are determined by changes in the subjects of the discourse, that is, the speakers' (Bakhtin, 1978, p.249); *complete* - every utterance has a specific interior completion as a possibility of responding to it; *expressive* – it doesn't merely refer to the subject, as proposition does, but it expresses its subject in addition; *intertextual* – enters in relationship with past utterances that had the same object, and with those of the future, which it foresees as answers;
- utterance is always a part of a dialogue and is always addressed to someone;
- utterance has an axiological horizon – it is endowed with values - and theme (meaning);
- the *axiological* aspect is the most important feature in the organization of the literary (and generally artistic) work.

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The focus of Bakhtin's inquest is not with language, but with the dynamic nature of (artistic) communication. As Michael Holquist notes in his article 'Answering as Authoring: Mikhail Bakhtin's Trans-Linguistics':

Utterances provide building blocks for the logosphere just as atoms do for the material world [...] 'Utterance' is Bakhtin's overall term for a duality of roles that previously has been obscured by the assumption that speaking and listening were mutually opposed, unitary activities: a person did either one or the other. In fact, of course, we do both simultaneously. Discourse is an action.

(Holquist, 1981, p. 311)

Interactive immersive media makes this communication between the author and the interlocutor the core part of the experience of the piece, and therefore is especially suitable for analysis through Bakhtin's lens.

Difference between Bakhtin's approach and formalists. Bakhtin's 'living speech'.

It is important to note that Bakhtin's approach to communication and 'utterance' is fundamentally different from the formalist approach suggested by his contemporaries, structural linguist Ferdinand de Saussure and the Russian formalists of the Prague and Moscow schools (Roman Jakobson and others). As Tzvetan Todorov points out

We find in [Bakhtin's writing of] 1928 a precise prefiguration of the critiques addressed today to the purely 'communicational' model of language. Bakhtin doesn't fail, in any case, to reformulate this critique himself, forty years later, and to extend it to all of the nascent semiotics.

(Todorov, 1984, p.56)

Bakhtin opposes the model of communication described as 'the transmission of ready-made messages by means of ready-made codes' and argues that 'in living speech, messages are, strictly speaking, created for the first time in the process of transmission and ultimately there is no code' (Bakhtin 1979a, p.352). Bakhtin's critique of Saussure and the Jakobsonian model of language communication can be extended to the critique of the subsequent structuralist and post-structuralist approach to artistic discourse found in the writings of Ronald Barthes, Jacques Derrida and others – an approach which ignores the axiological horizon of artistic utterance and the temporal

'Chronovist' conceptualization method: exploring new approaches to structuring narrative in interactive and historical character of communication. According to Bakhtin, the artistic discourse (and interactive immersive media as one of the examples of it) cannot be reduced to the structure of signs or symbols.

This research argues that Bakhtin's notion of 'utterance' as a part of 'living speech' not reducible to the structure will allow, as will be shown, for a new perspective on narrative construction in interactive immersive cinema.

As stated in Bakhtin's theory of 'utterance', the most important part of the 'utterance' is its axiological horizon and 'theme' (or meaning). I propose to analyse the theme of the 'utterance' in interactive immersive cinema by using the concept of 'chronotope'.

1.1.2. Bakhtin's theory of 'chronotope'.

The concept.

Bakhtin's application of the categories of space and time to culture is derived from Kant's theory of knowledge (Brandist 2002, p. 123). However, while for Kant these categories don't fundamentally change, for Bakhtin each epoch has specific senses of space and time, expressed and distilled in the artistic discourse of the time and also affect the perception of previously produced discourse. Brandist also points out that Bakhtin's usage of the concept is largely based on his extension of Cassier's analysis of space and time intuition as represented in language and myth (Brandist, 2002 p. 123).

The term 'chronotope' – conceived first by Bakhtin or borrowed by him from Ukhtomskii as the most recent scholarship and publications have suggested (Taylor, 2004) - allows him to link aesthetic form and history:

We will give the name of 'chronotope' (literally, time space) to the intrinsic connectedness of temporal and spatial relationships that are artistically expressed in literature [...] It expresses the inseparability of space and time (time as the fourth dimension of space) [...] Time, as it were, thickens, takes on flesh, becomes artistically visible; likewise, space becomes charged and responsive to the movements of time, plot and history. This intersection of axes and fusion of indicators characterizes the artistic chronotope.

(Bakhtin, 1998, p. 84)

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The notion of 'chronotope' was developed by Bakhtin for the analysis of literary texts, but since it is concerned with the expression of space/time continuum, it seems to be particularly suitable for the analysis of time-based media. As shown in Bakhtin's analysis of forms of chronotope in literary texts (Bakhtin, 1981) the chronotope is characterized by two main features: (1) altered spatial and temporal characteristics; (2) narrative potentials (chronotope predetermines which events can happen and how).

Bakhtin argues that chronotopes are:

the organizing centres for the fundamental narrative events of the novel. The chronotope is the place where the knots of narrative are tied and untied. It can be said without qualification that to them belongs the meaning that shapes narrative.

(Bakhtin 1998, page 86)

According to Bakhtin, the construction of space and time in artistic discourse is never accidental, unmediated or 'realistic' but always ideological, historical and constitutive of genres. The relationship between time and space is not always symmetrical – certain chronotopes privilege time, others privilege space. Bakhtin stresses that spatio-temporal relationships in 'chronotope' are not formal but are event-related and 'impregnated' with narrative possibilities. This notion of 'chronotope' as a narrative device is very important for the application of the concept to this research.

'Layers of chronotopes' in artistic text.

Bakhtin distinguishes the following 'chronotope layers' in an artistic text:

1. General – 'overlying' - chronotope of the text. This chronotope, in Bakhtin's analysis, defines the text's genre and expresses the historical particularity of time and space perception.
2. Multiple 'situational chronotopes' (Bakhtin also calls them 'individual motifs') existing within a single text, some being more dominant than others at different historic periods.

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For example, the motifs of 'meeting/parting', 'loss/acquisition', 'search/discovery', 'recognition/non-recognition':

Such motifs enter as constituent elements into plots [...]. By their very nature these motifs are chronotopic (although it is true the chronotope is developed in different ways in various genres).

(Bakhtin, 1981, p.97)

These are the event-triggering chronotopes where, as referred above, 'knots of narrative are tied and untied'. When these 'situational' chronotopes appear in the narrative, their familiarity allows for the interlocutor to supplement the causality of the text with their own emotional experiences, values and knowledge.

When discussing the motif of meeting in the Greek novel, Bakhtin writes that

In different works the motif of meeting may have different nuances depending on concrete associations, such as emotional valuation of meetings (a meeting can be desirable or undesirable, joyful or sad, sometimes terrifying, perhaps even ambivalent). [...] It may assume a multiply metaphoric or singly metaphoric meaning and may, finally, become a symbol.

(Bakhtin, 1981, p.98)

He uses the motif of meeting as an example and shows how a chronotope can be traced not only in literature, but also in 'other areas of culture and in various spheres of public and everyday life'.

3. In the course of cultural communication, the 'utterance' (text) is received by the interlocutor, and so the complex system of chronotopes inherent to text is further shaped by the chronotope of the interlocutor. This is a combination of the physicality of the immediate time/space situation and the broader chronotope of the interlocutor's epoch. The two elements of this chronotope can have different weight in different situations.

These three types of chronotope determine not only spatio-temporal continuum of the text, but also its narrative structures.

1.2. Extension of literary concepts.

While Bakhtin himself concentrated on verbal discourse and literature, he envisaged the possibility of extending the concepts he developed to other kinds of artistic and social discourse and wrote about it, listing cases of cultural communication. His grounding in neo-Kantian philosophy meant that even when writing about specific cases and texts, he was concerned with developing a framework that can be extended to explain the whole of cultural communication. Todorov notes that Bakhtin 'even sketches out, but without developing, a general typology of discourses, of which literary discourse would be but one instance' (Todorov, 1984, p.57)

Therefore it is justifiable to apply initially literary concepts to artistic discourse in other areas – in the case of this research, to 'authored' interactive media, treating it as a special case of cultural discourse (in Bakhtin's meaning of the word) where the interlocutor is physically present and the discourse always consists of at least two utterances (the utterance of the author and the response of the interlocutor) happening within the limited timeframe and in the same space.

In the last decades of the twentieth century Bakhtin's ideas, translated and interpreted by scholars from Julia Kristeva (Kristeva, 1986) and Todorov (Todorov, 1984) to Shepard and Holquist (Shepherd, 2004, Holquist, 1983, Bakhtin, 1981 and other texts) have been extended and applied to the analysis of artistic texts and socio-cultural phenomena outside literature.

A significant paper discussing the application of Bakhtin's 'chronotope' concept is an article 'Towards the Theory of Space in Narrative' by Gabriel Zoran (Zoran, 1984). Zoran modifies the concept of 'chronotope' in order to use it in his discussion about the representation of space in literary discourse and suggests an additional framework for the analysis of the implications of a chronotopic organisation of narrative space. This text is referenced to and referred in subsequent chapters of this research.

The attraction of the term 'chronotope' became such that it has been extended to unexpected areas. One example is organisational studies (Lorino, 2006), another example is a paper on chronotope in computer programming by Ivar Ørstavik, where the researcher uses the concept of chronotope and Bakhtin's analysis of 'hero' and

'Chronovist' conceptualization method: exploring new approaches to structuring narrative in interactive 'adventure time' in ancient Greek novels to analyse how programmers create their perceptions of a 'programme' and its 'run-time environment' (Ørstavik, 2005).

In some of the appearing texts, as Alexander rightly points out, researchers misinterpret or simplify Bakhtin's ideas and apply them too generously and/or too generally: 'suggesting there is a 'documentary chronotope' (Chanan) is similar to proposing that there should be the chronotope of fictional cinema and that of animation', she remarks (Alexander, 2007, p.61). However, it is significant that researchers from different cultural fields are turning to Bakhtin, and that his synthetic - one can say 'holistic' - approach to artistic text seems to become more and more in demand.

1.2.1 Bakhtin, intertextuality and hypertext.

The notion of intertextuality was developed by Julia Kristeva in the 1960s, notably in her 1966 essay 'Word, Dialogue and Novel' (Kristeva, 1986, pp. 35-49) as her interpretation of Bakhtin's dialogism. While this research is not based on intertextuality, it seems important to outline the specifics of the concept as it constitutes the most frequently occurring application of Bakhtin's theories to new media analysis, and, as I will demonstrate, it is not always entirely justified.

Lesic-Thomas in her work on Bakhtin and French structuralists writes:

The new term was introduced to replace Bakhtin's own notion of dialogism, and the conceptual change which accompanied this terminological change is probably one of the great intellectual repackaging and marketing schemes in recent history. It served the double purpose of helping Kristeva establish herself as a voice to be reckoned with in the French structuralist circles, as well as introducing those same circles to the world of Bakhtinian thought.

(Lesic-Thomas, 2001, p. 144)

Kristeva combined Bakhtin's 'dialogism' (or 'heteroglossia') with Ferdinand de Saussure's semiotic theory that signs derive their meaning within the structure of a text.

At the time most of Bakhtin's works were unknown outside his own country, which lead to the concept being isolated from the rest of Bakhtin's thought and ultimately used as a formalistic device, which is the opposite to what Bakhtin believed in and proclaimed. Separated from the rest of Bakhtin's theory, and especially taken without

'Chronovist' conceptualization method: exploring new approaches to structuring narrative in interactive reference to the neo-Kantian roots of Bakhtin's cultural philosophy, the use of his concepts seems to be devoid of the meaning intended by the author. Bakhtin's 'intertextuality' is one of the characteristics of 'utterance' in cultural communication, and it is defined by the exact (historical) place of the utterance in that communication. Utterance has intertextuality because 'it enters in relation with past utterances that had the same object, and with those of the future, which it foresees as answers' (M. Bakhtin cited from Todorov, 1984, p.53). This intertextuality is not general, but non-reiteratively actualized during each particular reading of the text (communication with the interlocutor).

Kristeva strips intertextuality of its temporality and describes it as a three-dimensional structure of the text, consisting of the author, the addressee and the exterior texts. Each word belongs to a horizontal axis between the author and the addressee, and to a vertical axis, connecting with the preceding or simultaneously occurring texts. Consequently 'any text is constructed as a mosaic of quotations; any text is the absorption and transformation of another' (Kristeva, 1986, p. 37). Lesic-Thomas call this a deliberate misinterpretation on Kristeva's behalf:

her [Kristeva's] attempt to 'market' Bakhtin to French intellectual circles was compromised by her willingness to 'shape' his thought to accommodate their interest in textuality and reluctance to talk of intersubjectivity or history.

(Lesic-Thomas, 2001, p.158)

This understanding of intertextuality, however, has become standard in modern semiotics:

'Intertextuality' thus has a double focus. On the one hand, it calls our attention to the importance of prior texts, insisting that the autonomy of texts is a misleading notion and that a work has the meaning it does only because certain things have previously been written. Yet in so far as it focuses on intelligibility, on meaning, 'intertextuality' leads us to consider prior texts as contributions to a code, which makes possible the various effects of signification. Intertextuality thus becomes less a name for a work's relation to particular prior texts than a designation of its participation in the discursive space of a culture: the relationship between a text and

'Chronovist' conceptualization method: exploring new approaches to structuring narrative in interactive the various languages or signifying practices of a culture and its relation to those texts which articulate for it the possibilities of that culture.

(Culler, 1976, p.17)

The concept of 'intertextuality,' with almost inevitable reference to Bakhtin, has been used extensively in analyses of new media, especially in relation to cybertext and hypertext in particular, since hypertext makes this modern notion of 'intertextuality' visible by making the internal connections visible and accessible via external links to related texts. The famous proponent of hypertext George Landow combines the notion of intertextuality with the idea that Barthes' announcement of 'death of the author' leads to the 'birth of the reader' and claims that hypertext is the new form exemplifying this readership. In his book 'Hypertext' Landow credits Bakhtin with the invention of hypertext:

Bakhtin's description of the polyphonic literary form presents the Dostoevskian novel as a hypertextual fiction in which the individual voices take the form of lexias.

(Landow, 2006, p.56)

Landow confuses 'lexia' – a separate and unrelated unit of information (the term he borrows from Barthes) - with what Bakhtin understands as 'voice' – the continuous expression of subjectivity in an artistic text. Applied to the analysis of Dostovesky's novels Bakhtin's concept of dialogism and polyphony suggests that fictional characters can speak in their own voice, a voice not subject to the single authorial control of their creator. This concept implies a known source of each voice, and this source is lost in a reading implied by a hypertext structure.

In support of his claim of Bakhtin's premonition of hypertext, Landow states that Bakhtin has used the words 'links', 'linkage', interconnectedness' and 'interwoven' (Landow, 2006, p.63). However, he does not explain the context in which these words were used. Landow also claims that 'Bakhtin's concept of textuality anticipates hypertext.' (Landow, 2006, p.112) Landow justifies this statement with quotes from one of Bakhtin's translators, Caryl Emerson, that for Bakhtin 'the whole is not a finished entry; it is always a relationship. Thus the whole can never be realized and set aside;

'Chronovist' conceptualization method: exploring new approaches to structuring narrative in interactive when the whole is realized, it is already by definition is open to change' (Landow, 2006, p.112).

This reading of Bakhtin's thought ignores yet another of Bakhtin's fundamental definitions. For Bakhtin 'whole' is not an individual text but cultural communication: the process of the dialogue between the author of cultural utterance and the reader/interlocutor. The text – the author's utterance – is a part of it. One of the defining characteristics of utterance is its completeness (realization) and the possibility for it to be answered.

As has been shown above, the open structure of a hypertext and its conscious demise of the author making way for 'active readership' are the opposite to Bakhtin's ideas about the ontological essence of an artistic utterance and the author's answerability. Therefore it might not be justifiable to use Bakhtin's theory of artistic discourse in the analysis of open participatory structures like hypertext.

1.2.2 Bakhtin and cinema

Stam.

One of the first works outside Russia extending Bakhtin's ideas to the analysis of films was the book 'Subversive Pleasures: Bakhtin, Cultural Criticism and Film' by Robert Stam (Stam, 1992). While the four major conceptual areas of interest for him are 'language, carnival, the body and dialogism' (Stam, 1992, p.23), he uses the concept of chronotope in his discussion about the perception and interpretation of films:

The chronotope mediates between two orders of experience and discourse: the historical and the artistic. [...] Bakhtin shows how concrete spatiotemporal structures in literature limit narrative possibility, shape characterisation, and mild a discursive simulacrum of life and the world. [...] Since the chronotope provides fictional environments implying historically specific constellations of power [...] it is ideally suited to a medium where 'spatial and temporal indicators are fused into one carefully thought-out concrete whole'

(Stam, 1992, p.40-41)

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Stam combines Bakhtin's ideas with Metz' treatment of cinema as *language* (language) and film as a discourse (Metz, 1974), and suggests that

A chronotopic approach might be of help in constructing a more comprehensive model for the analysis of time-space in the cinema, one that would simultaneously take into account questions of history, genre, and the specifically cinematic articulation of space and time.

(Stam, 1992, p.42)

Stam's idea that the notion of chronotope can help to put the discussion about filmic genre into a historic context has since been successfully applied by others: for example, McWilliams (2001) who analyses films by Spike Lee using the Bakhtin notion of discourse; Massood (1998, 2003) who applies the notion of chronotope to the analysis of cinematic representation of African-American cities; Alexander (2007) who suggests a chronotope of rise and fall as the framework for the analysis of 'Nights of Cabiria', 'Outcry' and 'Andrey Roublev'; and Flanagan's book on chronotope in Hollywood cinema (2009). The texts of Alexander and Flanagan will be discussed further in this chapter.

Stam supports Bakhtin's view of dialogism as the basis for the very existence of human discourse, and contemplates Bakhtin's view that no artistic utterance is completely original but that it always contains previous and subsequent discourse to which it responds:

Within a Bakhtinian approach, there is no unitary text, no unitary producer, and no unitary spectator; rather, there is a conflictual heteroglossia pervading producer, text, context and reader/viewer.

(Stam, 1989, p.221)

He applies Bakhtin's concepts of the interlocutor, the author and the artistic utterance to the perception of cinema and raises the question about the 'rights of the viewer' and the possibility of 'aberrant' readings

that go against the grain of the textual discourse. Although fiction films are constructed as persuasive machines designed to produce specific impressions and

'Chronovist' conceptualization method: exploring new approaches to structuring narrative in interactive emotions, they are not all-powerful; they may be read differently, and even subversively, by different audiences.

(Stam, 1989, p.42)

The main significance of Stam's work is that he showed the ways in which 'Bakhtin's language-based tropes' can be extended to media outside literature.

Flanagan.

Another substantial book using Bakhtin's language-based tropes in the analysis of audio-visual media was Flanagan's 'Bakhtin and the Movies: New Ways of Understanding Hollywood Film' (Flanagan, 2009). Drawing on the major categories developed by Bakhtin and his circle, Flanagan addresses the question of perception and interpretation of narrative in film, using, as the core of his framework, the notion of chronotope to analyse narrative formulas in Hollywood films. Expanding Stam's ideas Flanagan places Bakhtin's theory within contemporary film discourse (semiological and Freudian), and analyses different types of chronotope present in cinematic narrative of representative action films (*Die Hard* and *Speed* among others).

Flanagan argues that Hollywood genres, as expressed in spatio-temporal configurations, 'sustain (and occasionally deconstruct) the institutional values of Hollywood, and apprise viewers of a particular sense of history' (Flanagan 2009, p.1). He also argues that 'a commercial mode of production engenders the Hollywood' (Flanagan, 2009, p.181). He further suggests, following Stam, that 'a Bakhtin-inspired film theory can develop platform for the analysis not only of textual specificity (via chronotope and polyphony) but also of *spectatorial* specificity (via dialogism) (Flanagan, 2009, p.186). It is exactly this *spectatorial* specificity, which leads to different 'readings' of the same film by different audiences - "we shape the film as it shapes us" (Flanagan, 2009, p.187):

Hollywood film texts involve us in practices of watching and understanding that mobilise a field of discursive relations [...] identified as 'dialogic' [...] Bakhtin suggests that the project of dialogism encompasses all expressions of socio-ideological life and is without limit in space and time.

(Flanagan, 2009, p.181)

Road movies.

The paper by Alexandra Ganser, Julia Pühringer and Markus Rheindorf entitled 'Bakhtin's Chronotope on the Road: Space, Time, and Place in Road Movies Since the 1970s' (Ganser and al., 2006) discusses the genre of road movies using the description of Bakhtin's 'chronotope of the road'. It is a descriptive text, which diligently applies Bakhtin's framework to more than twenty American films made in 1970s-2000 and classified by the authors as 'road movies' or, at least, movies with some elements of the road (*Taxi Driver*, *American Graffiti* and *Night on Earth*, for example, are analysed as 'taxi films'). As a result the authors conclude that no film (or no artistic text) could be described by one chronotope but inevitably contain several chronotopes of different significance. They also state that

There is no longer such thing as a single chronotope of the road (as originally described by Bakhtin), even less there is a unified definition of 'the road movie'.

(Ganser and al., 2006, p.15)

I have mentioned earlier that a chronotope as defined by Bakhtin is not just a spatio-temporal narrative-defining structure of an artistic utterance, but also reflection of a historic socio-cultural situation that produces and interprets this utterance. The authors don't take this second part of the chronotope into consideration and fail to expand their analysis to discuss what the announced 'death' of the chronotope of the road signifies and reflects.

Alexander.

The relationship between a chronotope and its socio-cultural context is explored by Lily Alexander in her article "Storytelling in time and space: Studies in the Chronotope and Narrative Logic on Scree" (Alexander, 2007). There she analyses three classic movies - *Nights of Cabiria* by Fellini (Italy, 1957), *Outcry* by Antonioni (Italy, 1957) and *Andrei Roublev* by Tarkovsky (Russia, 1967) - using Bakhtin's framework of chronotope and Eisenstein's concept of cinematographic 'architectonics' which connects the composition and vertical and horizontal movements. She identifies a new chronotope, which she calls 'the chronotope of rise and fall', and argues that this chronotope foreseen by the three outstanding filmmakers independently from each

'Chronovist' conceptualization method: exploring new approaches to structuring narrative in interactive other in their works, has become very significant for the present cultural situation, helping to grasp the historical dynamics of the modern condition:

The chronotope of rise and fall implies not only the postmodern, but also the post 9/11 condition: it is a form of 'anticipatory reflection' of art. It forestalls the modalities of displacement of human beings and meanings (geographical and semantic), and an inevitability of the movement-lunge through an unstable and decentralised universe. An absent sacred centred and a void of the pivotal point of ethics within any social spatio-semantic model prove to be essential factor for the chronotope of rise and fall revealing itself in culture.

(Alexander, 2007, p.59)

She further suggests that the new task for modern narratologists and film scholars is to discover new types of chronotopes or to rediscover old ones, to name them and to identify their properties.

Alexander's text combines very detailed analysis of the dramatic structure of the films with the Bakhtinian notion that artistic utterance exists in the context of ever-lasting cultural dialogue. She describes how a new chronotope first articulated and embodied in an artistic text acts a premonition and a nucleus around which historical socio-cultural time and space subsequently restructure themselves, which is a novel and interesting hypothesis that has not been developed by any other researches, and I will come back to it in Chapters 7 and 8.

Tarkovsky.

There are several other texts exploring the concept of chronotope in relation to the films by Andrey Tarkovsky, which seem to perfectly fit the chronotopic framework.

Tarkovsky himself did not use the term chronotope when talking about his work. However, in his book *Sculpting in Time* (Tarkovsky, 1987) he explores the notion of cinematic time, space and memory in similar terms. For him cinema is a recording of an event, which has been reconstructed or provoked by the director. This event, as a subjective rendering of an artist's memory or perception, has its own tempo-spatial organisation with its own rhythm. Tarkovsky situates rhythm inside the frame rather than relying on editing to create it. He insists that a 'cinema image' - or, using

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Bakhtin's term, an artistic utterance - embodying a specific tempo-spatial arrangement - or chronotope - is created by the artist, is self-sufficient and contains its own reality. It should not require a mental reconstruction/ synthesis from different elements by the viewer:

Nor can I accept the notion that editing is the main formative element of a film, as the protagonists of 'montage cinema', following Kuleshov and Eisenstein, maintained in the 'twenties, as if a film was made on the editing table. The cinema image comes into being during shooting, and exists *within* the frame. [...] Editing brings together shots, which are already filled with time, and organises the unified, living structure inherent in the film; and the time that pulsates through the blood vessels of the film, making it alive, is of varying rhythmic pressure. The idea of 'montage cinema' - that editing brings together two concepts and thus engenders a new, third one - again seems to me to be incompatible with the nature of cinema. Art can never have the interplay of concepts as its ultimate goal.

(Tarkovsky, 1987, p. 114)

Natasha Synessios in her analyses of Tarkovsky's *Mirror* (Synessios, 2001) argues that Tarkovsky has captured the sense of the fullness of chronotopic time-space described in Bakhtin's definition. While she rightly identifies the chronotope of childhood as the most important overlaying chronotope of the movie, she is mistaken when she calls the first scene of the movie "a chronotope" – the episode portraying a therapist session during which a teenage boy is cured from stuttering. A chronotope, according to Bakhtin's definition, is a time-space continuum capable of producing meanings and plots. Narratives are formed from the combination of different varieties of these characteristics. While it is a powerful scene, the opening episode of *Mirror* it is not a chronotope. Alexander warned against similarly too generous and too general application of the term (Alexander, p. 42).

In another text on the same film 'Memory and Exile: Time and Place in Tarkovsky's *Mirror*', Peter King uses *Mirror* to contemplate the notion of dwelling, memory, space and time. He explores 'this idea of remembrance, of how we seek to remember and memorialise a place to which we can no longer return' (King, 2008, p. 68).

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I will return to the discussion of Tarkovsky's *Mirror* later in this thesis when I discuss possible applications of the 'chronovist' framework.

1.2.3. Bakhtin and new media

There has been a growing body of academic scholarship applying Bakhtin's ideas to new media and games.

Geoffrey Rockwell in 'Gore Galore: Literary Theory and Computer Games' (Rockwell, 2002) sets a task of developing 'a topology of games and a theory of computer games as rhetorical artefacts suitable for critical study'. He argues that while there are three different perspectives on computer games - the psychological perspective, the literary perspective and the hypertext theory perspective - and suggests using Bakhtin's idea of dialogism as a theoretical framework for computer games analysis. He also suggests using chronotope - which he mistakenly calls 'near-metaphor' - 'to categorise hypermedia works' (Rockwell, 2002, p.354). Although he rightly notices that chronotope 'provides the unity to the game' and that is more than the physical setting of the game, but incorporates 'the experience of time and pace in which the game unfolds' (Rockwell, 2002, p.355), he does not develop these ideas.

An essay by a PhD student James Barrett 'Chronotope and Cybertexts: Bakhtinian Theory for Tracing Sources of Narrative in Interactive Virtual Environments: From *Naked Lunch* to *Fast City*' (Barrett, 2002) compares chronotopes in an early post-modernist text and in three cybertexts, following Bakhtin's idea that a change in the nature of chronotope leads to a related change in the genre of the narrative text. Barrett dutifully follows the framework developed by Bakhtin for the study of genres in novel, and even though the texts in question are cybertexts, Barrett's analysis stays within the boundaries of literary discourse and offers no new perspectives.

Eladhari in her Masters thesis 'Object oriented story construction in story driven computer games' (Eladhari, 2002) attempts to apply the concept of chronotope, together with the ideas by ludologists including Juul and Aarseth to story-driven computer games. She identifies three levels of structure: 1/ code level, containing engines, framework and game programming; 2/ story level, which consists of the

'Chronovist' conceptualization method: exploring new approaches to structuring narrative in interactive overall story (if there is one), the deep structure and the individual story-carrying objects; and 3/:

discourse level, which consists of the states of the individual elements in the now of the playing, and the sequential order created between the different parts of the narrative simultaneously with the movements of the player through the game. It is in this layer that the surface structure of the narrative is visible.

(Eladhari, 2002, p.23)

Eladhari employs this three-level structure to suggest an object-oriented programming where each element is conditioned by its spatio-temporal situation in the game. However, her understanding of chronotope is one of 'story-carrying objects' which is a significant simplification of the concept:

In the chronotope of story driven computer games it is the wandering between, and the interaction with, the story-carrying objects of the game world that create the narrative. The narrative time is brought forward by the movements of the player, in the geographical room as well as through the player's interaction with the story-carrying object.

(Eladhari, 2002, p.44)

She believes that a chronotope can be created by a combination of 'story-carrying objects'

I believe that by forming the chronotope of the story driven game in an object-oriented way one can achieve a more synthetic and less mechanical chronotope than if one applies a whole narrative structure of internal causal dependencies on a game world.

(Eladhari, 2002, p.45)

Eladhari explains the game design stages and contemplates 'how a utopian game can be contracted'. Her suggestion to use the concept of chronotope at the conception and development stage of game design is novel in computer games research literature, but she fails to develop it into any consistent framework and to fully connect it with Bakhtin's ideas.

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Up to the present time, the most significant paper that applies Bakhtin's concepts to digital media is 'Time and Space in Digital Game Storytelling' by Wei, Bizzocchi and Calvert (Wei and al., 2010). The researchers suggest a model of spatio-temporal structure in games building on Zoran's interpretation of Bakhtin's idea.

Our starting point is to examine how time and space are structured in narrative in general, then incorporate insights from the field of game design and game studies, and finally reach a game-specific description of the structural aspects of time and space in game narratives. After an overview of the foundational concepts we use for game narrative analysis, we will delineate in detail how these aspects characterize narrative time and space in games, and how time and space converge in the construction the plot.

(Wei and al., 2010, p.4)

The authors devise a novel classification of time and space in interactive digital games, which I will refer to when discussing the proposed 'chronovist' tool in Chapters 5 and 6. These concepts were first introduced in the 'How Story Can Tell Games: Narrative and Micro-narrative as Components of Game Experience' by Grant and Bizzocchi (Bizzocchi, 2005), but it is the 2010 text which I will be referring to in this research.

Besides this small body of research, the application of Bakhtinian theories to new media has been mostly limited to the analysis of cybertext and electronic literature using Kristeva's concept of 'intertextuality', partially based on Bakhtin's concept of dialogism or 'heteroglossia' in cultural texts - for example, 'Telling Interactive Stories', a doctoral thesis by Sarah Atkinson (Atkinson, 2009). The text lists Bakhtin's idea of dialogism as Kristeva's 'intertextuality' as one of possible approaches to the theory of interactive storytelling, but ignores the concept of chronotope all together.

There are various possible reasons for this current lack of scholarship. One might be the appropriation of Bakhtin's concepts by scholars of literary discourse (there is a significant body of research on dialogism, polyphony, heteroglossia and Bakhtin's 'meta-linguistics'). Another reason might be that any fruitful application of Bakhtin's ideas requires thorough scholarship and knowledge of the whole body of his work, but

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it is only now that the main body of texts by Bakhtin and Bakhtin's circle is becoming fully available in translation.

1.2.4 Difference between chronotope and 'storyworld', chronotope and 'simulation'.

It is important to stress that the complex nature of 'chronotope' and its structure-defining and narrative-defining properties (as has been shown earlier) distinguish the concept of 'chronotope' from what is defined as 'storyworld', 'gameworld' and 'simulation'.

The term 'story world' is used in different contexts.

In cognitive narratology the 'story world' is a cognitive model of the represented worlds created in storytelling as explicitly argued in David Herman's book 'Cognitive Storyworlds' (Herman, 2002). Herman defines 'storyworld' as a mental construct, a world evoked in the reader's mind by a narrative. As has been shown above, the concept of 'chronotope' is related to the structure of artistic discourse, not to the cognitive interpretation of it. Therefore 'chronotope' and 'storyworld' in Herman's sense describe different entities.

In ludology and game design practice the term 'storyworld' (or 'game world') is widely used as the ensemble of all elements of the game – the characters, the objects and the space. Game designer Chris Crawford defines it as

a complete dramatic universe embracing all the dramatic truths the artist wishes to communicate. This storyworld is not a spatial region populated with walls, tunnels, and characters; it is certainly not a set of specifications for a physical simulation. It is instead a collection of stages, populated with objects and characters. The artist specifies many kinds of interactions between the characters, who then execute these interactions according to their personalities, relationships, and histories.

(Crawford, 2005, p.69)

Yet another meaning of 'storyworld' is suggested by George P. Landow, who defines 'storyworld' as an environment of a multitude of potential narratives, which 'only disclose their stories in response to the reader's actions' (Landow, 2008, p.349). This definition seems to echo Murray's definition of 'simulation' as a computer-generated

'Chronovist' conceptualization method: exploring new approaches to structuring narrative in interactive 'dense narrative world' 'enticing us into exploring [...] from every possible perspective' (Murray, 1997, p. 181).

The first difference between 'storyworld', 'simulation' and 'chronotope' is that the concept of 'chronotope' implies a spatio-temporal continuum, while in the concepts of 'story world' or 'simulation' spatial and temporal characteristics are separated.

The second difference is the inherently representational function of chronotope. Bakhtin writes:

the chronotope, functioning as the primary means for materializing time in space, emerges as a centre for concretizing representation, as a force giving body to the entire novel [text]. All the novel's [text's] abstract elements--philosophical and social generalizations, ideas, analyses of cause and effect- gravitate toward the chronotope and through it take on flesh and blood, permitting the imaging power of art to do its work. Such is the representational significance of the chronotope.

(Bakhtin, 1981, p. 250)

Thirdly, the 'chronotope' has structural and narrative consequences, unlike 'storyworld' and 'simulation', which do not offer a systematic framework for structuring an artistic text.

1.3 Conclusion.

This chapter introduced literary concepts of chronotope and utterance developed by Mikhail Bakhtin, and discussed the current body of research where these concepts are extended to the analysis of non-verbal media. All reviewed works use Bakhtin's concepts as an analytic tool applied (more or less successfully) to existing artistic texts.

The novelty of my research is that the proposed Bakhtin-based apparatus is used as a conceptualising tool for conception and creation of new artistic texts. I argue that the application of Bakhtin's concepts of 'chronotope' and 'utterance' will not only allow us to approach interactive immersive cinema as a sub-type within the general context of cultural communication, but also to re-establish the concept of authorship, to find new perspectives on author/ interlocutor relationship and to develop new approaches to narrative construction in interactive immersive cinema. The next chapter will show the path to these new approaches.

2. Chapter 2. Designing with chronotope. Application of the concepts of 'chronotope' and 'utterance' to interactive immersive cinema.

Premise.

As stated in Bakhtin's theory of 'utterance', the most important part of the 'utterance' is its 'theme' (or meaning). I propose to analyse the theme of the 'utterance' in interactive immersive cinema by using the concept of 'chronotope'.

I argue that the meaning of utterance in interactive immersive cinema is directly related to chronotope. Further, I intend to describe discourse in interactive immersive cinema as a conversation – or exchange of utterances - between the author and the interlocutor, taking place within a specially created time-space continuum. This is the continuum where the chronotope of the interlocutor is fused with the overlying chronotope of the text and its situational chronotopes, allowing for these chronotopes to be subjectively and directly experienced in their unique spatio-temporality by the interlocutor. This 'holistic' model of interaction in interactive immersive cinema places emphasis on organically fused reality, not on a collection of pre-defined entities cleverly combined together.

The actions of the interlocutor in interactive immersive cinema have consequences. They do not attain full materiality as in the real world, but these actions are more affecting and powerful than in non-interactive media or interactive games because of their non-reiterative and irrevocable affect on the story progression (even in interactive games there is always the possibility of starting with a 'new life'). It is through these irrevocable actions performed by the interlocutor within the fused conglomerated chronotope that the interlocutor gains first-hand (first person) embodied experience of it.

What are the consequences of this framework for the practical task of narrative construction? How can these embodied experiences be structured and manipulated?

2.1. 'Utterance' in interactive immersive cinema. 'Non-verbal conversation'.

As suggested in the previous section, discourse in interactive immersive cinema can be analysed in the following way:

- the space of the encounter between the author and the interlocutor is the fusion between the general (overlying) chronotope(s) of the text, its situational chronotopes and the chronotope of the interlocutor;
- the interlocutor is immersively present ('embodied') in this space;
- artistic discourse is the event that takes place in this space;
- the theme of this discourse is chosen by the author; it is expressed through the chronotopes of the text and in the course of the communication (interaction) between the author and the interlocutor;
- the way communication develops is predetermined by the fused chronotopes;
- through this 'encounter in the chronotope' the interlocutor can experience the chronotope first-hand subjectively.

The nature of the experience in interactive immersive work can therefore be described as a (non-verbal) conversation taking place in a chronotopic environment: the author tells a story/ develops an argument, while the interlocutor empathizes with the story - follows it, asks questions, prompts for more details, agrees, argues³.

2.2. The structure of 'chronotope' in interactive immersive cinema.

Another set of questions arise when the definition of the interlocutor's experience is rephrased and completed in the following way: an interactive immersive work can be described as a (non-verbal) conversation between an author and an interlocutor taking place within a specially created time-space continuum where the 'chronotope' of the interlocutor for the time of the interaction is fused with the overlying 'chronotope' of the text and its situational 'chronotopes' allowing for these chronotopes to be

³ Beryl Graham (Graham, 1997) discussed the use of 'conversation' metaphor to describe the human-computer interaction in interactive computer-based art, limiting it, however, to the mechanics of communicational exchange. The framework used in this research is different - rooted in Bakhtin's interpretation of artistic utterance and the nature of author/interlocutor communication via artistic text; it is concerned with how author/interlocutor interaction reveals the meaning of artistic utterance.

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The practical application of Bakhtin's concept of 'chronotope' to interactive immersive media requires the breaking down of the notion of 'chronotope', to discover how it can be structured and implemented in the chosen media, and through what formal devices its specific spatio-temporal continuum is expressed.

Lorino calls the chronotope 'the tacit matrix of situated meaning-making' (Lorino, 2010). As a matrix, according to Lorino, the chronotope consists of:

an integrated spatio-temporal framework, including, as Deleuze suggests: order (sequences, milestones, cycles, time scales, continuity and discontinuity, acceleration and deceleration); mapping (aims, means, trails, obstacles); a temporal order inscribed in a map and a map evolving in a temporal process; generic activities (actual, potential and projected activities, which provide possible futures) and generic roles and characters (with their identities and values, genres of discourse and tools), corresponding to the spatio-temporal framework; boundaries and crossings.

(Lorino, 2010, p.8)

Gabriel Zoran in his article 'Towards the Theory of Space in Narrative' (Zoran, 1984) attempts to interpret and develop the notion of 'chronotope' as the verbalised structure of story space, as well as to address the problems of spatial and temporal representation, suggesting several categories useful for the purpose of this research. He ignores the narrative loading of the chronotope and concentrates on those formal devices through which the space and time are expressed, which makes his finding important for this research.

Zoran suggests that there are two types of structural relationships determined by the chronotope. The first one is 'synchronic' – of motion (movement) and rest, affecting both objects and characters. Zoran stresses that 'movement' and 'rest' are relative terms: 'rest is the state of being bound to a given spatial context, while movement is the ability to cut oneself off from spatial context and to switch over to different contexts' (Zoran, 1984, p.318).

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The second type of relationship is 'diachronic', expressed through directions, axes and powers, and imposed by the chronotope:

One may state that space, on the chronotopic level, is structured as a network of axes having definite directions and a definite character. Axes may or may not be determined by motions, which actually take place in the world of the text. An actual movement is a result of several powers: will, obstructions, ideal, characters' intentions, and so forth. These powers can also act in space when there is no real movement. In Kafka's *The Castle*, for example, the line stretching between the village and the castle is the central axis in the spatial structure of the novel, focusing all the powers acting in the 'world', despite the fact that it is never actively traversed by the main character. Chronotopic structure of space does not mean an occasional movement on a neutral scene, but rather a conception of the entire space in terms of a field of powers.

(Zoran, 1984, pp.318-319)

Contrary to Bakhtin, however, Zoran separates the space of the story and the structure of the space imposed on the space by means of the discourse (in his case, a verbal text). According to him, the structured space belongs to the reconstructed world, but the structure itself is imposed by the (linguistic) nature of the text. He compares this relationship to the relationship between the 'fabula' and the 'sujet':

Both belong to the reconstructed world, both may be regarded as levels of organization of elements of reality (events), but the fabula retain their natural arrangement whereas the sujet forces on the motives the verbal order of the text. Still, the sujet in itself is not identical to the verbal level. Here, too, at the level of textual structure, there are patterns of organization imposed on the reconstructed world, which are not natural to it, neither as space nor as space-time, but are rather forced onto it because of its being signified in a verbal text.

(Zoran, 1984, p. 320)

Zoran lists those aspects of language that determine the properties of the imposed structure – they are '(1) the essential selectivity', '(2) the temporal continuum and (3)

'Chronovist' conceptualization method: exploring new approaches to structuring narrative in interactive 'the point of view and the perspective structure of the reconstructed world due to it' (Zoran, 1984, p.320).

The same properties can be found in the structures produced by audio/visual media. The essential selectivity of audio/visual media in interactive immersive cinema is expressed through the opposition of 'on screen'/'off screen', or "in the frame'/'outside the frame' - if we consider the frame to be the border of the projected image (which, in interactive immersive cinema, can be of any shape, not necessarily rectangular like in cinema). The properties of the frame and framing have been explored in cinema theory and can inform this research. For example, Deleuze suggests that 'the closed system determined by the frame can be considered in relation to the data that it communicates to the spectators: it is 'informatic' (Deleuze, 2005a, p.18). Cubitt writes that 'events inside the frame are not only incomplete in time but fragmentary as percepts, so that each event of projection evokes a new assemblage of focalized and marginal imagery' (Cubitt, 2004, p.30). While these ideas can be applied to interactive immersive cinema, it should be noted that in the chosen media the 'essential selectivity' of the 'frame' can sometimes be complicated by simultaneous multiple-screen projection. The properties of the 'frame' established in cinema theory will need to be re-examined, to establish how this altered 'essential selectivity' can support and express the 'chronotope'.

The temporal order implies the sequential linear character of discourse as experienced by the interlocutor. In cinema the temporal order is actualized through montage. The concept will need an adjustment to take into consideration potential pauses or gaps in the discourse due to the interaction with an interlocutor, as well as the possibility of simultaneous multiple-screen projection.

The properties of devices such as the point of view and the perspective structure ('here-there relationship') in interactive immersive cinema will need to take into consideration the central position of the interlocutor, requiring a different degree of subjectivity than cinema (compared, for example, with Branigan's 'invisible observation' model of the viewer – 'observer' – in cinematic narrative (Branigan, 1984, p. 163).

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Apart from the aspects of audio/visual media determining the spatio-temporal structure as have been discussed, another important device through which the chronotope can be structured and expressed in interactive immersive cinema is its plot-inducing properties, both experienced 'subjectively' - as potential interactions with the interlocutor - and 'objectively' – as events shown to the interlocutor.

Once these devices of chronotope in interactive immersive cinema have been investigated and described, it will be possible, I argue, to create a comprehensive framework for practical narrative construction.

2.3. Sketches of the concepts' application.

2.3.1. 'March'.

As a sketch of what the application of these concepts can entail in interactive immersive cinema, I will look here into an existing interactive audio/visual work, whose characteristics place it in the 'interactive immersive cinema' category as defined earlier. The work is 'March' by Grahame Weinbren produced in 1995-1997. This is an early work and might be technologically simplistic compared to the possibilities offered by today's technology. However, I have chosen it because the characteristics of interactive immersive cinema are very prominent here, and because Weinbren has provided detailed documentation on the project, clearly stating his intentions, as well as referring to it in his theoretical texts (Weinbren, 1995, Weinbren, 1999, Weinbren, 2004, also on his website <http://www.grahameweinbren.net>)

In 'March', a complex two-folded interaction is controlled by the tempo and the direction of movement of the visitor and his/her position in space. Several story streams appear and combine as a result of the viewer's walking on the ramp. The movements of the viewer are mirrored on a big screen by the corresponding camera movements around Rembrandt's painting 'Sacrifice of Isaac', which not only allows the viewer to choose what part of the painting he/she wants to look closer at, but also provides a clear visual guidance as to how the interface worked. Weinbren called it 'dancing with a painting' (Weinbren, 2004).

Below the big screen, there is a small monitor showing video footage of an actor playing the character of the Angel on his way to prevent Abraham's sacrifice of his son.

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The Angel's walk is composed of several different 'phases'. The movements of the viewer on the ramp cause the transition from one phase of the Angel's walk to another, revealing different facets of the Angel – his thoughts, his desires, his fears. As the viewer moves around the ramp, the Angel's thoughts become less and less noble. The desires that led to his previous falls resurface.

The viewer is involved in a complex communication structure, existing simultaneously in two communicational contexts. First, it looks like the piece is set up to satisfy the viewer's desire to investigate the painting, with the interlocutor being the protagonist of the piece and the talking Angel simply accompanying this investigation. However, once the interlocutor has started paying attention to the Angel, the roles change. The interlocutor becomes a 'supporting character' who 'accompanies' the Angel on his walk, even though there is no direct communication between the Angel and the interlocutor (the Angel talks to himself, not to the visitor). The connection between the viewer's movements on the ramp and the change in the Angel's thoughts is not immediately apparent.

As the walk progresses, the author demonstrates that the very same non-verbal 'utterance' in a different context has completely different consequences. The visitor's innocent curiosity to see the painting has led the Angel astray, while if the viewer had remained still, the Angel would have stayed on his course and reached his destination.

Weinbren states that the aim is to entice the interlocutor into 'travelling around the painting' stating that the painting depicts several moments simultaneously, 'moments that could not have occurred at the same instant'. If the viewer travels around the ramp 'making the right series of moves', he/ she can 'bring it back from an impossible representation of a single moment to a representation of a series of moments in time' (Weinbren, 2004). However, 'the right direction' of the interlocutor's movements leads to the Angel getting distracted and losing his 'right direction'.

The structure of the piece as it is can be confusing. While the interlocutor's movements on the ramp can be quite physical and immersive, the connection between the movements and the zooms and pans in the painting projection is artificial: it breaks the immersion and the illusion of 'marching with the Angel'. Once the illusion of the

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'march together' is broken, the connection between the viewer's movements and the Angel's monologue cannot be easily discerned.

2.3.2. 'March' remixed.

It can be suggested that the piece is built on 'the chronotope of the road' (it is also stressed by the title of the work). 'The chronotope of the road' is closely linked with the 'motif of meeting'. Bakhtin writes:

[o]f special importance is the close link between the motif of meeting and the chronotope of the road ('the open road'), and of various types of meeting on the road. In the chronotope of the road, the unity of time and space markers is exhibited with exceptional precision and clarity.

(Bakhtin, 1981, p.98)

Chance is another motif closely connected with the chronotope of the road. Chance and meeting are both plot-generating devices:

Should something happen a minute earlier or a minute later, that is, should there be no chance simultaneity or chance disjunctions in time, there would be no plot at all.

(Bakhtin, 1981, p.92)

If the structure of the chronotope of the road were to be applied to the piece, the author would perform the following structural tasks:

1/ the physical space of the presentation and the virtual space of the interactive story would need to be bridged either through interface devices or VR devices to create technologically enhanced immersion;

2/ the bridged space would need to have special characteristics/altered geometry corresponding to the story;

3/ the order of events/ utterances in this space as revealed through the interaction would need to correspond to the altered temporality of the story;

'Chronovist' conceptualization method: exploring new approaches to structuring narrative in interactive 4/ the props and characters and the logic of events would need to correspond to the chronotope – with a certain familiarity of the interlocutor being required for understanding.

Therefore retaining the immersive connection between the marching Angel and the marching interlocutor would be a priority for the author. The image of the painting could be projected on the ramp, so that the visitor could physically 'approach' its various parts. The sense of spatial amplitude and distance could then be increased by applying zooms and pans, which are synchronised with the viewer's movements. The marching and talking Angel could be then presented as a holographic projection following the interlocutor in his/her trajectory around the painting.

The author could also use 'meeting' and 'chance' as plot-generating devices: for example, the Angel's apparition and disappearance could be connected with a certain position and with the actions of the interlocutor.

This is a brief outline of a proposed 'remix' of the piece, but it demonstrates that an application of the chronotope framework to practical narrative construction would focus the author's narrative intentions, suggest new possible narrative structures and lead to a very different narrative experience for the interlocutor.

2.3.3 Landscape One.

'Landscape One' by Luc Courchesne (1997) is a well-documented interactive audio-visual installation⁴ which has special interest for this research as it is, in my view, the closest example to a 'chronovist' dramatic structure in existing interactive work (even though it was created prior to this investigation).

The installation is a multi-screen 360-degree projection of a crossroad in Mont-Royal Park in Montreal. The visitor to an installation can communicate with different characters that appear from out of the bushes using multi-choice suggestions presented on screen. Depending on the success of the communication the visitor can be 'taken' by the character to a different part of the park or abandoned. No physical action of

⁴ A detailed description and footage are available, for example, from the artist's website: <http://www.courchel.net> [Accessed 2 August 2014].

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behalf of the visitor is involved, except turning around to see the 360-degree view (unlike in 'March' above, where the viewer is engaged in walking).

The filming is done so that there is an impression of the observer's view and a continuous passage of time congruent to the time of the visitor - there is no change of point of view or obvious cinema-style editing, the changes between shots are done using dissolves and mostly indicate the possibility of choice (branching points of narrative).

The installation can be described as a rendition of a chronotope of 'crossroad', which is the underlying chronotope of the installation. It is expressed visually - the initial position of the visitor is on the crossing of alleys in the park. It is also expressed narratively - the place produces encounters with strangers, who may, or may become, acquaintances and who would inevitably part pursuing their own route. The strangers may or may not provide new narrative turns (a cyclist takes the visitor to a look-out point or a girl runs away into the bush when the visitor jokingly threatens to tickle her) but all events are conditioned by the place and time.

The virtual characters that appear in the piece speak French with Quebecois accents and perform activities typical of what people do on Mont Royal in real life. In a way they are a generalised representation of francophone inhabitants of Montreal - I lived in Montreal for three years, two streets away from Mount Royal Park (Parc du Mont-Royal).

Mount Royal has been a significant symbol of Montreal, starting with the foundation of the city. The city of Montreal was founded in 1642 by Paul Chomedey de Maisonneuve, an aristocrat and a officer, and Jeanne Mance, a nun, who left Europe for New France following the religious calling which both, independently from each other, had in their dreams (Desjardins, 1979, Linteau, 2013). Both recalled a vision of a mountain which later, once they had travelled along the St. Laurence river, they recognised as Mont Royal. In 1643 the settlement was threatened by severe floods. De Maisonneuve prayed to the Virgin Mary, and when the floods subsided, he made a pilgrimage to the top of Mont Royal and erected a cross, which is still maintained there.

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Mont Royal was also a location for the cult Quebec film *Jesus de Montreal* by Denys Arcand (1989, Canada) in which the Passion story is retold in modern Montreal with the main character dying after being crucified on top of Mont Royal.

There are many cultural, both official and non-official activities taking place in Mont Royal park, for example, in the summer there is a weekly tam-tam (African drums) gathering (called 'Les Tams-tams du Mont Royal) at the foot of Mont Royal, in front of the monument to George-Etienne Cartier.

From the lookout point on top of the mountain there is a breath-taking view of the city, the St. Laurence river valley and surrounding countryside, which is mostly flat so it is rumoured that on a clear day one can see as far as the Atlantic Ocean.

In 2010 the National Film Board of Canada created an interactive web documentary exploring the cultural, historical, religious and geographical significance of Mount Royal, as well as personal contemplations, memories and photographs.

One can also contemplate the significance of the mountain as a landmark and vantage point, especially being located in the middle of a relatively flat expanse, and a reflection of this in the existing narrative, including myths and fairy tales.

Unfortunately, most of this significance and the symbolism of the place remain unexplored in Courchesne's piece (there is one episode where a virtual cyclist brings the visitor to the viewing point and explains what can be seen in different directions).

Landscape One remixed.

While there is no doubt that 'Landscape One' is an engaging interactive immersive piece, its structure is anamorphic and has no narrative progression. There is also a sense of 'an open ending' - the piece can continue forever, the ending is brought up by an external intervention when, for example, the viewer calls for night or for rain, the sound of thunder follows and all virtual characters run away from the park. The exploration of possible interactions and locations has no real purpose except that of curiosity.

It can be suggested that the chronotope of crossroad already embodied in the piece is supplemented with one of the other chronotopes evoked by the settings: the

'Chronovist' conceptualization method: exploring new approaches to structuring narrative in interactive chronotope of a mountain, chronotope of a sacred place, or chronotope of rise and fall (suggested by Alexander), to name a few.

The progression through the piece can, for example, be connected with the gradual descent into the past, where the virtual characters come from further and further back in time, and the landscape changes subtly, 'undoing' for example the effects of European civilisation on natives. This temporal descent into the past can be combined with the spatial ascent towards the cross and the mountain top, when each character with whom the viewer successfully engages takes the viewer higher and higher along the path.

Mirror and Aspen Movie Map remixed.

'Aspen Movie Map' is an iconic piece produced in late 1970s as a part of military-funded research by an MIT undergraduate student Peter Clay together with Bob Mohl and Michael Naimark (with many others involved in production) and was the first example of interactive virtual reality - a city tour of Aspen, Colorado⁵. The city was filmed using a complex setup of stop-frame 16mm cameras on a camera car and an encoder that triggered cameras every 10 feet. The sound was also recorded. Viewers could move freely along the streets, check their position on an overlying map and change the seasons from autumn to winter. The piece did not have any narrative intention but demonstrated the potential of the virtual representation of an environment and raised questions about the mechanics of interaction and immersion. The technologies and concepts employed in the piece have since been developed and used in various fields from Google Earth maps to interactive installations, but Aspen Movie Map remains, in my opinion, not only the first but the purest example of interactive virtual space.

It can be suggested that Tarkovsky's 'Mirror', considered, as demonstrated earlier, a rendition of a chronotope-based narrative in a linear non-interactive form, could be combined with the Aspen Movie Map concept to create an interactive immersive chronotopic space.

⁵ The documentation is available from: <http://www.naimark.net/projects/aspen.html> [Accessed August 1, 2014]

'Chronovist' conceptualization method: exploring new approaches to structuring narrative in interactive Tarkovsky's idea of fragmented but persistent personal memories fused with places which have since disappeared can be embodied in an interactive space changing as it is being explored. Once acknowledged and 're-remembered', the images of the characters and spaces fill the background of a gradually appearing graphic 'mirror' where the visitor in the course of exploration will start discovering her own features.

2.4. Conclusion.

The purpose of this chapter was to introduce the chronotopic approach to the conceptualisation of interactive immersive texts. I have sketched how the chronotope can be structured and expressed in interactive immersive cinema, and how its plot-inducing properties, both experienced 'subjectively' - as potential interactions with the interlocutor - and 'objectively' - as events shown to the interlocutor - can be employed by the interactive immersive text author. Once these devices of chronotope in interactive immersive cinema are investigated and analysed in detail, they can be used to create a comprehensive novel framework for practical narrative construction, as will be shown in subsequent chapters.

I have also outlined concept applications to several existing and well-known audio-visual texts showing new narrative possibilities provided by the chronotopic approach. In the next chapter I will look into existing examples of interactive media to identify spatio-temporal and narrative elements relevant for this research.

3. Chapter 3. Contemporary interactive storytelling media.

The previous chapter mentioned several seminal iterative audio-visual works - 'March', 'Landscape One', 'Aspen Movie Map'. This chapter aims to look at other examples of interactive digital media outside interactive audio-visual installations to identify the boundaries and to contextualise the area of interest within contemporary new media discourse. It will list existing examples of interactive media, which informed my research and also those, which could benefit from its outcomes.

3.1. Interactive immersive cinema.

Definition.

The main focus of my study is a conceptualisation method, which can be used in creation of what I call 'interactive immersive cinema'. In the context of this thesis I define 'interactive immersive cinema' as an interactive immersive audio-visual environment employing pre-recorded live-action or documentary visual and audio data, and/or live computer-generated visual and audio data, aiming to provide the visitor with narrative experiences.

3.1.1. 'Cinema'

Using the word 'cinema' in the absence of a better term helps to limit the area of the study to the interactive immersive audio/visual media that has an author, uses both image and sound, has narrative intention and a representational function.

3.1.2. "Interactive".

The term 'interactive' has been used in different contexts over the last decades and it is necessary to clarify the definition as used in this research.

Aaron Smuts in his article 'What is interactivity?' (Smuts, 2009) analyses five definitions of interactivity. They are: 1/ 'control theory' by Rafferty which Smuts rejects as 'overly inclusive' (Smuts, 2009, p. 55); 2/ Ryan's 'making use of input' theory, which Smuts criticizes for lack of clear definition (in fact, instead of a definition Ryan offers several metaphors of what interactivity is – the metaphors of travel, kaleidoscope, supermarket and theatre stage), (Ryan, 2001, pp. 217-224); 3/ Saltz 'input/output' theory, which

'Chronovist' conceptualization method: exploring new approaches to structuring narrative in interactive inevitably connects interactivity with computers, 4/ Mclver Lopes' 'weak' and 'strong' interactivity and 'modifiable structure theory' and 5/ Murray's procedural/ participatory interactivity theory in which she makes no distinction between interactive and participatory. Smuts' own definition – 'that something is interactive for an individual if it responds in a way that is neither (1) radically random nor (2) almost completely controllable' (p 66) is also not satisfactory as it aims at defining interactivity, without, by his own admission, any relation to interactive art. Steuer (1992, p.84) defines interactivity as "the extent to which users can participate in modifying the format and content of a mediated environment in real time". Developing this definition further Cho and Leckenby suggest that 'different definitions [of interactivity] can be classified by whether they focus on user-machine interaction, user-user interaction, or user-message interaction' (Cho and Leckenby 1997, p.54).

The definition of interactivity in interactive art proposed in this research is based on the application of Bakhtin's theory of artistic discourse and utterance and the suggested analysis of interaction as a non-verbal conversation between the author and the interlocutor. The 'user-message' classification from the Cho and Leckenby's definition is interpreted here as the 'interlocutor (user) – author (the producer of messages)' interaction. This brings the definition of interactivity within the context of Bakhtin's analytical framework where an interlocutor is treated as an addressee of an artistic utterance participating in a 'conversation' with the author, in the course of which the meaning of an artistic text is revealed and interpreted. Therefore for the purpose of this research I define 'interactive' as 'requiring the interlocutor's participation to be actualised'.

3.1.3. 'Interactive' as opposed to 'participatory'.

By stressing the 'interactive' (as opposing to 'participatory') aspect in the definition and placing it into the context of Bakhtinian analysis of artistic text, I argue for the return of the author's responsibility for the interactive artistic text explored during the interaction by an interlocutor. This is as opposed to a distributed and therefore anonymous and annihilated responsibility presented in texts produced by participatory culture and 'collective intelligence' (the term developed by Pierre Levy in his book 'Collective Intelligence: Mankind's Emerging World in Cyberspace', appeared in original French in

'Chronovist' conceptualization method: exploring new approaches to structuring narrative in interactive 1994⁶ and in English translation in 1997)⁷ (Levy, 1997) and employed in what Jenkins defines as 'convergence culture' and 'participatory culture' (Jenkins, 2006).

In a White Paper entitled 'Confronting the Challenges of Participatory Culture: Media Education for the 21st Century' (co-authored by Jenkins with Ravi Purushotma, Katie Clinton, Margaret Weigel and Alice Robison) participatory culture is described as:

a culture with relatively low barriers to artistic expression and civic engagement, strong support for creating and sharing one's creations, and some type of informal mentorship whereby what is known by the most experienced is passed along to novices. A participatory culture is also one in which members believe their contributions matter, and feel some degree of social connection with one another (at the least they care what other people think about what they have created).

(Jenkins 2009, p. 3)

As Jenkins writes, the forms of participatory culture include: affiliations — memberships in online communities centred around various forms of media; expressions — producing new creative forms; collaborative problem-solving — working together in teams, formal and informal, to complete tasks and develop new knowledge; and circulations — shaping the flow of media (such as podcasting, blogging). Besides the problems listed in the White paper – such as the participation gap, the transparency problem and the ethics challenge, the need to overcome the digital divide and develop 'the cultural competencies and social skills needed for full involvement' (Jenkins. 2009, p. xiii), participatory culture raises an important issue of authorship, especially when it concerns 'producing new creative forms'.

3.1.3.1 Authorship.

This research concentrates on authorship and presumes the existence and the significance of the author (someone who implements the authorship). The problem of author as such rests outside the scope of this investigation. However, I feel it is important to briefly outline Bakhtin's concept of the author on which this research is based.

⁶ Lévy, P., 1994. L'intelligence collective. Pour une anthropologie du cyberspace. Paris: La Découverte.

⁷ Translated by Robert Bonono.

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The debate related to authorship and participation is not new to the academic community.⁸ The death of the author announced by Barthes in his famous essay (Barthes, 1977) is often referred to in discussion concerning collaborative interactive art. However, as Lesic-Thomas rightly reminds citing Sean Burke, 'not even the critics who took up the notion of the death of the author with enthusiasm fully believed in it' (Lesic-Thomas, 2001, p.191). She suggests that "La mort de l'auteur" is simply the highest expression of the frustrated and prolonged anti-positivist and anti-biographical sentiment.'(Lesic-Thomas, 2001, p.197) For Barthes the author is not the author of the text but an attribute of it that might stand in the way of the reader as an obstacle to the production of meanings. This view is fitting for participatory culture.

This research follows a different view, which is supported by Bakhtin's writings on the author and authorship, including 'Author and Hero in Aesthetic activity' (Bakhtin, 1990). According to Bakhtin, only the author can give unity to the artistic vision and to the work:

An author is the uniquely active form-giving energy that is manifested not in a psychologically conceived consciousness, but in a durably valid cultural product, and his active, productive reaction is manifested in the structures it generates - in the structure of the active vision of a hero as a definite whole, in the structure of his image, in the rhythm of disclosing him, in the structure of intonating, in the selection of meaning-bearing features.

(Bakhtin, 1990, p. 8)

As Lesic-Thomas stresses, 'for Bakhtin, the author is a 'form-giving energy' and the origin of the unity (where monologic or polyphonic) of a work of art' (Lesic-Thomas, 2001, p.233). The author is also the focus of his own historic and cultural chronotope and speaks from the point of view of 'unfinished contemporaneity'.

3.1.3.2. The resurrection of the author.

It seems noteworthy that such an adept of new media as Lev Manovich argues for the re-instatement of personal authorship in new media. In his article 'Models of Authorship in New Media' (Manovich, 2002) he discusses how interactivity and

⁸ From scientific debates related to authorship and participation credits, for example: Welker and McCue, 2007; Drazen and Curfman, 2002; Claxton, 2005 to new media debates: Diamond, 2005.

'Chronovist' conceptualization method: exploring new approaches to structuring narrative in interactive participation produce new models of authorship – namely, 'collaboration', 'interactivity as miscommunication between the author and the user', 'authorship a selection from a menu', 'authorship as collaboration between a company and the users', 'authorship as collaboration between the author and software', 'remixing' and 'sampling' (Manovich, 2002, pp. 1-8). He suggests a new model of authorship based on 'license' and 'kernel' concepts borrowed from the Open Source idea:

I think that the ideas of license and of kernel can be directly applied to cultural authorship. Currently appropriation, sampling, remixing and quoting are controlled by a set of heterogeneous and often out-dated legal rules. These rules tell people what they are *not* allowed to do with the creative works of others. Imagine now a situation where an author releases her/his work into the world accompanied by a license that will tell others both what they should not do with this work and also what they *can* do with it (i.e. the ways in which it can be modified and re-used). Similarly we may imagine a community formed around some creative work; this community would agree on what constitutes the kernel of this work. Just as in the case of Linux, it would be assumed that while the work can be played with and endlessly modified, the users should not modify the kernel in dramatic ways.

(Manovich, 2002, pp. 9-10)

Manovich cites OPUS (Open Platform for Unlimited Signification) as an example of the implication of this concept of 'license' and 'kernel' (OPUS employs the Free Art License (2007, <http://artlibre.org/licence/lal/en>).

The statement on the OPUS site reads:

The basic idea of the Opus project is to create a community of creative people from all over the world. Opus will give people the chance to collaborate and to present their work to an international public. Once you have published your work other members of Opus will be able to give their comments and reflections on your work through the attached discussion forums. You can inspire others and allow them to take your work as a starting point for a new artwork. Opus follows the same rules as those that operate in all free software communities - i.e. the freedom to view, to download, to modify, and to

'Chronovist' conceptualization method: exploring new approaches to structuring narrative in interactive redistribute. The source (code), in this case the video, image, sound, or text, is free to use, to edit, and to redistribute.⁹

While most of the reviewed discourse appears to concentrate on the issue of asserting or relinquishing authorship in new media, it is important to draw attention to the question of the author's answerability¹⁰ and responsibility for the artistic utterance. The line of argument outlined above allows to establish a clear distinction between 'participation' (promoting distributed authorship, collective intelligence and open access, but also leading to the disappearance of personal responsibility for the result) and 'interactivity' (understood as an author-lead conversation with the interlocutor) and to argue for the 'reinsertion' or 're-instatement' of the author in the artistic (interactive) text.

3.1.4. 'Immersive'.

'Immersion' in new media is commonly understood to involve those states of consciousness where the user's awareness of his/her own physical body is greatly diminished or lost because of the surrounding virtual environment.

For example, Murray in her book 'Hamlet on Holodeck' defines immersion as:

Immersion is a metaphorical term derived from the physical experience of being submerged in water. We seek the same feeling from a psychologically immersive experience that we do from a plunge in the ocean or swimming pool: the sensation of being surrounded by a completely other reality, as different as water is from air that takes over all of our attention our whole perceptual apparatus. We enjoy the movement of our familiar world, the feeling of alertness that comes from being in this new place, and the delight comes from learning to move within it.

(Murray, 1998, pp. 98-99)

However, in this study I will use Ryan's definition of 'immersive' as 'providing an emotional, temporal and spatial illusion of 'being transported' into the story world of the piece' (Ryan, 2001a, p.66)

⁹ <http://www.opuscommons.net/templates/doc/index.html>, [last accessed February 10, 2011]

¹⁰ as defined by Bakhtin (Bakhtin, 1990).

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It stresses the interlocutor's 'first-person' involvement with the artistic text (the interlocutor becomes a protagonist - or one of the protagonists in the artistic discourse).

Ryan develops the notions of immersion and presence in relation to interactivity and connects them to what she calls 'the embodied subject' and 'the perceiving subject' in the story-world space:

As for the terms immersion and presence, they capture two different but ultimately inseparable aspects of the total effect: immersion insists on being inside a mass substance, presence on being in front of a well-delineated entity. Immersion thus describes the world as a living space and sustained environment for the embodied subject while presence confronts the perceiving subject with individual objects. But we could not feel immersed in a world without a sense of the presence of the objects that furnished it, and the objects could not be present to us if they weren't part of the same space as our bodies. This approach means that factors that determine a system's degree of interactivity also contribute to its performance as immersive system.

(Ryan, 2001a, pp. 67-68)

This study builds further on Ryan's definition and adds the notion of an embodied presence within a chronotope created by a combination of immersion and interactivity. This is instrumental in the subsequent analysis of interactive immersive cinema through the lens of Bakhtin's framework – approaching the interactive immersive cinema as a 'chronotope experienced first-hand'.

3.2. Boundaries.

The definition of 'convergence culture' as 'a cultural logic involving an ever more complex interplay across multiple channels of distribution' (Jenkins 2008)¹¹ and 'a situation in which multiple media systems coexist and where media content flows fluidly across them' (Jenkins 2006, p. 322) justifies that the majority of critical discourse in new media is not genre- or field-specific. The notions of interactivity,

¹¹ The concept of what is now called 'convergence media' was first suggested by Ted Nelson in 1974 in his book *Computer Lib/Dream Machines* calling this 'transposability': 'There has always been, but now is newly, a UNITY OF MEDIA OPTIONS. You can get your message across in a play, a tract, a broadside, a textbook, a walking sandwich-board, a radio program, a comic book or fumetti, a movie, a slide-show, a cassette for Audi-Scan or the AVS-10, or even a hypertext.' (Nelson, 2003, p. 318)

'Chronovist' conceptualization method: exploring new approaches to structuring narrative in interactive immersion, narrative are often discussed across a broad range of examples, varying from video games to electronic literature. However, this study seeks to establish narrative models specific to a particular type of interactive media named 'interactive immersive cinema', as outlined earlier.

Interactive immersive cinema does not yet exist as a distinct entity, like, for example, 'conventional' cinema or theatre; however, traits of it can be found in different examples and genres of digital media as will be shown below.

3.2.1. New forms of cinema.

There are a variety of cinematic texts that do not offer a technologically enhanced immersion' and don't create a sense of presence in a virtual world (as defined earlier), but which explore interactivity and/or non-linear narrative construction. This overview will identify several examples and suggest how the analysis of these examples can be used for the development of new narrative models in interactive immersive cinema.

3.2.1.1. Complex narratives

This group consists of conventionally produced and exhibited films which do not change the mode of a viewer's engagement but require advanced comprehension techniques, presenting the viewer with a complex non-linear narrative construction. These films employ different approaches in order to change conventional narrative structures.

Alteration of point of view.

The alteration of point of view employs the change of the focalization and the mode of narration. 'Focalization' and 'mode of narration' are defined by Gérard Genette (Genette, 1980), both 'horizontally' - from one third-person character to another (Linda Aronson calls them 'multiple protagonist narratives', Aronson, 2010);¹² and 'vertically' – changing the diegetic 'plane', the distance and the perspective of the narrator. Examples are *Rashomon* (Akira Kurasawa, 1950), *Vantage Point* (Pete Travis, USA, 2008). The change of narrative focalization and mode shifts attention from the narrative to the narrator and promotes the viewer's detachment from the story.

¹² Aronson, L., 2010. *The 21st-century screenplay: a comprehensive guide to writing tomorrow's films*, Los Angeles: Silman-James Press.

Temporality alterations.

These structures concentrate on temporality and suggest alternatives to the linear progression of the story-time:

- reversed temporality like, for example, in *21 Grams* (Alejandro González Iñárritu USA, 2003), *Irreversible* (Gaspar Noe, France, 2002), *Memento* (Christopher Nolan, USA, 2000);
- dispersed temporality of a collage of events like in *Mirror* (Tarkovsky, Russia, 1975);
- disturbed temporality like the combination of the 'stopped' time of story-space and progressing story-time of the protagonists in *Groundhog Day* (Harold Ramis, USA, 1993).

These structures exploit a tension between the linear and irreversible time of the viewer and non-linear temporality of the narrative. A similar tension can be found in the relationship between the linear time of the interlocutor and the non-linear temporality of story-time in interactive media.

Causality alteration.

Another type of complex narrative structure in film explores alternatives to causality: forking-paths¹³ or 'variant' narratives like in *Blind Chance* (Krzysztof Kieslowski, Poland, 1987), *Smoking/ No Smoking* (Alain Resnais, France, 1993), *Sliding Doors* (Peter Howitt, UK/ USA, 1998) or *Run Lola Run* (Tom Tykwer, Germany, 1998). This type of narrative structure promotes the idea of 'multiple drafts of reality'. In film, it is done in a way that preserves cognitive coherence. Bordwell argues in his essay 'Future Films' (Bordwell, 2002) that:

forking-path movies, calling forth folk-psychological inferences and designed for quick comprehension, have stretched and enriched some narrative norms without subverting or demolishing them. Indeed, part of the pleasure of these films stems from their reintroduction of viewer-friendly devices in the context of what might seem to be ontologically or epistemically radical possibilities.

(Bordwell 2002, p.91)

¹³ term introduced by David Bordwell (Bordwell, 1985) and referring to *The Garden of Forking Paths*, a short story by Jorge Luis Borges.

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It should be noted that the construction of forking-path, 'variant' or 'multi-draft' narratives in film is different from the 'forking-path', 'branching' 'parallel-stream' narrative model in interactive media (referred to later) due to the temporal mode of viewing. In film, all available 'variants' are introduced to the viewer during the discourse. In interactive media, the interlocutor is confined to one chosen path. Bordwell makes an observation regarding the cognitive accumulation happening for the viewer in the multiple-draft structures:

the last future we encounter is privileged by its absorption of the lessons learned in an earlier one. Instead of calling these "forking-path" plots, we might better describe them as multiple-draft narratives, with the last version presenting itself as the fullest, most satisfying revision. Once more, this conforms to our propensity to weight the ending, to treat it as the culmination of what went before it...even if all of what went before could not really have come before.

(Bordwell 2002, p.102)

The function of 'multi-draft' narrative structures in film is therefore different from the possible application of this model to interactive narrative media.

Fractured 'collage' / 'puzzle' structures

In fractured 'collage'/'puzzle' structures the whole is assembled from seemingly unrelated and independent parts. Examples are films by Buñuel, for example, *Un Chien Andalou* (1929), *L'Age d'Or* (1930), *Short Cuts* (Robert Altman, USA, 1993), *Timecode* (Mike Figgis, UK, 2000).

The relation between these different parts reveals a new paradigm of film editing, from cross-screen referencing in *Timecode* to 'hot-spot' connections in Buñuel. The novelty of Buñuel's approach to cinematic narrative has been pointed out, with great insight, by Marsha Kinder:

To achieve subversive ruptures, Buñuel relies not primarily on montage but rather on common objects or incongruous details in an inappropriate setting that function as hot spots with considerable transgressive power. [...] In Buñuel's most radical films, he uses these objects as interface devices – that is, as "hot spots" or "warp zones" which enable the story, camera, character, or spectator to move

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from one scene or narrative realm to another - a strategy that creates the illusion of narrative cohesion even when the film has little or no plot.

(Kinder, 2002, pp.9-10)

Buñuel's use of 'common objects in inappropriate settings' as 'warp zones' or 'portkeys' to interconnect different tempo-spatial continuums in cinematic narrative will be analysed in the discussion about the application of chronotope concept to narrative in interactive immersive cinema.

Complex narratives in film and the purpose of this research.

This research is based on a premise argued (though in different ways) by two cognitive film narratologists David Bordwell (Bordwell, 1985) and Edward Branigan (Branigan, 1992 and Branigan, 2005) that the viewing of film is fundamentally cognitive, and that cinema spectatorship requires a certain 'competency'. However, once this competency has been attained, the viewer is potentially able to comprehend and re-construct the story from a variety of deviations from the linear narration.

Once the new narrative model for interactive immersive cinema is introduced and described, an analysis of narrative properties of non-linear structures in conventional cinema (introduced under the heading of 'complex narratives') will help to develop practical approaches to narrative construction in interactive immersive cinema authorship.

3.2.1.2. 'Deleted scenes' and 'alternative endings'.

This group of examples brings to attention the changes in a viewer's engagement with conventional cinema enabled by the availability of movies on DVD and Blue-Ray. This gives the possibility of a random-point entry to the movie, scene selection and various speeds of viewing, as well as access to a variety of additional features often offered as a supplement to the film itself (optional sound commentaries, deleted scenes, alternative endings, 'making of' films, interviews with creators and actors; and even an offer to re-edit a scene (on Wim Wender's DVD of the *Wings Of Desire*).¹⁴

¹⁴ List of special features on the 2008 release of 'Wings of Desire': feature length commentary with Wim Wenders and Peter Falk; out-takes and deleted scenes, conversations on 'Wings Of Desire', trailer, exclusive limited edition collector's booklet; interactive Berlin map, "The Angels Among Us" (a background featurette), original ad artwork (printed on the dvd cover).

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Aware of this spectatorship change, producers use special features on DVDs as an additional mode of engagement with the audience. Tom Brown uses the term 'DVD intratext' when he investigates aspects of the DVD audience address in his paper 'The DVD of Attractions? The Lion King and the Digital Theme park'. He argues that:

in following a path through The Lion King's two discs, audiences do not simply view a series of activities and materials 'extra' to the film, they circulate and participate in an 'enclosed environmental artwork' akin to the Disney theme park.

(Brown, 2007, p. 169)

Another example is 'Shark Tale' DVD with a special menu called 'fun-filled scenes':

This function differs from standard menuing in a couple of crucial ways. Firstly, moments of the film are grouped into categories rather than reflecting its chronology. These categories are 'Laugh Out Loud,' 'Gross Out!!', 'Dance Scenes', 'Lenny and Oscar' and 'Ernie and Bernie'. The categories offer the user a variety of moments or attractions arranged, respectively, into general comedy, the more scatological musical numbers and two different comic character double-acts. Another crucial difference from normal DVD chapters is that these are not simply access points to the film, but are moments made discrete by the DVD's encoding. One chooses a category, then a particular moment within that category, and is then given a brief burst of action, which can last from around ten seconds to a couple of minutes. The disc then returns to the root menu.

(Brown, 2007, p. 173)

Yet another examples is *Singin' in the Rain* special edition, which includes a feature entitled *Singin' Inspirations*:

When activated, icons appear during the film, generally during the musical numbers, allowing the viewer to click enter on their remote control and view the original rendition of, for example, *Singin' in the Rain* in The Hollywood Revue of 1929 (Reisner, USA). This function is almost identical to the *Follow the White Rabbit* feature on the DVD for *The Matrix* (Andy and Larry Wachowski,

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1999), which shows brief documentary films on the special effects work behind a particular scene.

(Brown, 2007, p. 174)

The availability of 'DVD special features' has altered mechanisms of spectatorship and has prepared the viewer to consider the narrative in a movie to be, to a certain extent, an 'open' structure, available for interactive exploration.¹⁵

3.2.1.3. Games based on films and games with cinematic sequences.

Almost every Hollywood release of entertainment movies is now accompanied by the release of a videogame based on the film – for example, the *Harry Potter* games (Electronic Arts, 2001-2010), the *Tron* games (Disney Interactive Studios, 1982-2010), the *Matrix* games – 'Enter the Matrix' and 'The Matrix: Path of Neo' (by Shiny Entertainment, 2003-2005), *The Chronicles of Narnia* games (by Traveller's Tales, 2005-2007) and so on.

Geoff King and Tanya Krzywinska argue (in the same vein as in my earlier discussion of the function of DVD special features) that the attraction of film-based computer games is the possibility of entering the world inside the cinema screen:

Film-based or film-related computer games are sold at least partly on the basis of the attraction of an occupation of worlds the contours of which have been established elsewhere, often on film. The player can, at one remove, 'become' the central figure in a cinematic milieu, following and extending the kinds of experiences offered in film. 'Aliens vs. Predator 2' (Sierra/Fox Interactive, 2001), for example, can be played either as marine, alien or predator. The world of the film is extended in terms of both interactivity and variation of perspective/allegiance. [...] A sense of immediacy, here, is closely tied up with the process of hypermediacy. The sense of presence exists at a second-order level: presence within another form of mediation, specifically, in this case, that of cinema.

(King and Krzywinska, 2002, p. 149)

¹⁵ See also an article 'Directors and DVD Commentary: The Specifics of Intention' by Deborah Parker and Mark Parker (Parker and Parker, 2004)

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Many video games not connected to films also use cinematic elements. One of these cinematic elements is 'cut-scenes', or independent narrated (not interactive) episodes. These cut-scenes can be live-action (like in *Black* by Electronic Arts, 2006 where each mission of this first-person shooter is separated by a live-action video) or animated. The latter can be in-game cut-scenes adapted to the game-play and rendered live by using the same game engine as the game itself, like in *Grand Theft Auto* games by Rockstar Games (1997-2009), or pre-rendered, allowing for a higher visual quality, like the opening of *Sid Meier's Civilization V* (2K Games, 2010). Another element that games have borrowed from cinema is the point-of-view: pre-rendered camera angles in some third-person and first-person games, and the widely used first-person perspective. Games also use cinema-like edits.

King and Krzywinska rightly point out that

An incorporation of elements of the 'cinematic' can be a substantial component of the specific experience offered by some games as games. The importance of the "cinematic" needs to be understood both in terms of the use of particular textual devices and the discursive situation of the qualities of games. [...] 'More cinematic' is generally assumed to equal 'better' and more distinctive gameplay, even if this is an assumption resisted by some members of the game-playing and game-designing community (many gamers and game reviewers are, not unreasonably, suspicious of directly movie-linked games, many of which are viewed as transparent attempts to cash-in on successful movie franchises with products that lack much in the way of compelling gameplay of their own.

(King and Krzywinska, 2002, pp. 149-150).

Games based on films provide a useful reference as to how cinematic narrative elements can be rendered in interactive structures.

3.2.1.4. 'Ergodic' movies

While providing interesting viewing experience, 'interactive films made for DVD' – the examples I discuss here are *Switching* (Onkotype, Denmark, 2003), *Deine Wahrheit* (Your Truth), (Germany, 2004) and *Late Fragment* (National Film Board, Canada, 2007) - are effectively examples of 'hypermedia' or 'cybertext', as they draw attention to the

'Chronovist' conceptualization method: exploring new approaches to structuring narrative in interactive materiality of the platform, empathize its assertive presence between the reader and the text, but cannot create what was earlier defined as 'technologically enhanced immersion providing the sense of presence in the virtual world'.

Late Fragment allows the viewer to either follow the 'default' editing path or change to a 'click path', providing different choices during every given shot. Both paths progress in a linear manner from the beginning to the conclusion of the film. The authors claim that the experience

is not unlike channel surfing in front of the television, except imagine that each channel presents different scenes from the same story. Sitting on the couch, remote control in hand, audiences can click "enter" on their remote control, and impact the way the story unfolds, sequencing the events of the story depending on when and how often they click "enter"¹⁶.

Using a remote control as an interface can, in certain situations, create the desired immersion – like, for example, in Lynn Hershman Leeson's work 'Lorna' (1983-85). The video is presented on a television-like monitor and interaction is controlled via a television remote control, mirrored by a remote control in the character's hand within the television itself. Here, the interface functions as a prop in order to facilitate immersion. In the piece, the character (Lorna), tries to control a television set in her room using *her* remote control. However, it is the viewer's, not Lorna's, remote control and will that controls both her remote control and her fate, causing the television channels to switch and ultimately drive Lorna to one of three predefined endings.¹⁷ In this piece, the remote control is used as a communication device, which not only connects the viewer with the author but also connects the viewer with the character.¹⁸

However, in *Late Fragment*, as in *Switching* the role of the remote control is purely technological. In *Switching* the progression of the film is also controlled via a remote control. In some presentations of the film the remote control was passed to the cinema audience, but the description of the film refers to the same 'ideal' viewing situation as

¹⁶ <http://latefragment.com/2008/03/what-is-interactive-film/>, last accessed 15 February 2011

¹⁷ The piece is documented by Lynn Hershman Leeson on her website: Hershman Leeson, Lynn, 'Lorna' documentation', <http://www.lynnhershman.com>, last accessed 10 December 2010

¹⁸ Since the viewer's remote had more functions – it also controlled other objects in Lorna's room, while her own remote controlled only the television – it also serves as a metaphor for the interaction contained in the piece.

'Chronovist' conceptualization method: exploring new approaches to structuring narrative in interactive suggested for *Late Fragment* - 'your sofa with remote control in hand'.¹⁹ The viewer's engagement with the piece suffers from the same problem of haptic interruption as described by Mangen when discussing hypertext fiction reading:

Phenomenologically, such scanning and browsing [pointing and clicking the remote control] has the effect of making the overall reading [viewing] experience one of sensory-motor (and primarily haptic) interaction with the technological features of the hypertext [hypermedia], rather than a primarily hermeneutic immersion in the fiction being told [shown]. Furthermore, it imbues the narrative with a latent ambiguity that is a hallmark of digital hypertext; there is always the possibility that the visual display might change – minimally, or completely, with the click of a mouse. The mere possibility of the click bringing about some degree and kind of visual change impacts our phenomenological immersion in a narrative fiction in a way that is simply not possible when reading print narratives.

(Mangen, 2008, p. 412)

Mangen points out that when we are given the possibility of pointing the remote control and clicking, our attention is already distracted by the very possibility of switching, rather than being fully directed towards the potentially phenomenologically immersive narrative on the screen (Mangen, 2008 p. 413).

The narrative structures in these two examples are different: in *Late Fragment* the story progression is linear: in *Switching* the story is structured in ever-repeating loops of different streams.

Deine Wahrheit suggests an even different structure arranged as a multiform plot. The authors André Melzer, Sebastian Hasse, Oliver Jeskulke, Inga Schön, and Michael Herczeg in their analysis of their film suggest the term 'interactive multi-protagonist film' (IMP film) which they define as being 'based on the common structures of linear narrative storytelling and provides the viewer with various decision points within the evolving story that support an active choice among different protagonists' views' (Melzer and al. 2004, p. 1).

¹⁹ <http://www.switching.dk/en/>, last accessed 15 February 2011

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The film has five characters and five chapters. Each of the chapters can be followed from one of characters' perspective, resulting in five to the power of the fifth (3125) different ways of watching the film. The focus of interest is in the missing main character Tracy. The viewer associates with Tracy's brother – the protagonist of the story – and meets with the other five characters to be given their accounts of the events. The transition points are clearly identified and are positioned between the chapters. This facilitates the viewer's engagement with the piece and suspends the distraction of haptic interaction for the duration of each chapter. Based on the conducted research of viewers' experiences, the authors claim that

Viewers of the interactive version of the IMP film reported an outstanding feeling of familiarity with the characters shown in the film. (...) The IMP film provides the viewer with an interactive basis that supports their natural motivation to gather additional information. To choose among different competing views is found attractive and challenging, and, eventually, helps to make complex human behaviour more transparent.

(Melzer and al. 2004, p. 9)

The 'ergodic movies' – as has been demonstrated in three examples - use live-action footage, have narrative intentions and employ interactivity as a part of their structure. However, they suffer from the same limitations as were discussed earlier in relation to hypertext. The constant reminder of the materiality of the technological platform prevents phenomenological immersion, while these works do not aim at creating technologically enhanced immersion and a sense of presence. However, analysis of their narrative structures helps to inform the quest for new narrative models in interactive immersive media.

3. 2. 2. Computer (video) games.

Computer video games may appear to have many elements similar to those of interactive immersive cinema. Up until very recently they also used to differ, as I intend to demonstrate, in their primary intentions. I will outline the distinction between video/computer games and interactive immersive cinema, but also suggest that an analysis of how narrative elements in video games are structured can inform my search for a new narrative model for interactive immersive cinema.

3.2.2.1. Theory of computer games.

The distinct theory of computer games as an independent critical discourse appeared in the late 1990s/early 2000s. Jester Juul in his 2005 book 'Half-Real' compares that time to 'a gold rush and a race toward being the first to point out special aspects of games, to format the field, to define words, and to point to similarities and dissimilarities between games and other cultural forms.' (Juul, 2005, p.11). In these early days of the fast developing theory of computer games there were two conflicting and simultaneously complementing approaches to games analysis. One was presented by narratologists who insisted that computer games 'told stories' and could be best understood through the analysis of their narrative elements. The other one was presented by 'ludologists' who claimed that while certain computer games might have narrative elements, games were not narratives, but should be approached from a different perspective, and that narrative analyses obscured the essence of the media.²⁰

At present, ludology seems to have secured its place as the principal approach to the study of games and has established a certain common vocabulary for game and gaming analysis. There are several definitions suggested to describe what is a 'game', with some modifications employed when discussing the particular case of a computer (video) game:

A game is a form of recreation constituted by a set of rules that specify an object to be attained and the permissible means of attaining it.

(Kelly, 1988, p.50)

A game is a system in which players engage in an artificial conflict, defined by rules, that results in a quantifiable outcome.

(Salen and Zimmerman, 2003, p.96)

Costikyan argues that 'game' is an interactive entertainment and, more precisely, 'an interactive structure of endogenous meaning that requires players to struggle toward a goal' (Costikyan, 2002, p. 24).

²⁰ An attempt at bridge-building between the open structure of games and the closed structure of stories, the concept of quests, has been proposed by Ragnhild Tronstad (Tronstad, 2001), Espen Aarseth (Aarseth, 2004b), and Susana Tosca (Tosca, 2003). Quests in games can actually provide an interesting type of bridge between game rules and game fiction in that the game can contain a predefined sequence of events that the player then has to actualize or enact.

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In Juul's text 'The Game, the Player, the World: Looking for a Heart of Gameness' (Juul, 2003) he lists several other definitions of 'game' and offers what he calls 'a classic game model':

A game is a rule-based formal system with variable and quantifiable outcome, where different outcomes are assigned different values, the players exert effort in order to influence the outcome, the player feels attached to the outcome, and the consequences of the activity are optional and negotiable.

(Juul, 2003 p.36)

While Juul's definition is quite explicit when applied to videogames, it seems at the same time incomplete and imprecise. In his subsequent book *Half-Real* he modifies this definition to suit videogames and explicitly argues that video games are an inseparable fusion between 'rules' and what he calls 'fiction' (Juul, 2005). He gives no definition of 'fiction' but freely substitutes the word for 'make-believe element' (p. 12), 'game fiction' (p. 14), or 'story' (p. 16). A much more rigid approach to defining and analyzing the 'fiction element' in videogames can be found in Frasca's book 'Simulation 101' (Frasca, 2001). There he suggests that the basic tool for understanding videogames is 'simulation' and uses the words 'videogames' and 'simulation' almost as synonyms. He defines simulation as an alternative to representation and narrative and stresses that simulation allows the creation of models of objects, systems and behaviours:

I find that "interactive fiction", "interactive theatre" and other "interactive" flavoured inventions do miss the point by trying to force games into something that they are not. Respected theorists such as Janet Murray, Lev Manovich, Brenda Laurel and Henry Jenkins insist on explaining games by analysing their similitude with previously existing media forms. While I do not necessarily discard these approaches, I think that games are ontologically different from narrative because they are not just based on representation. Instead, they rely on simulation, which is a way of portraying reality that essentially differs from narrative.

(Frasca 2001, p.1)²¹

21 'Simulation as the basic tool for understanding videogames. I will focus on the particular characteristics of simulation as an alternative to representation and narrative. (...) Certainly, each outcome could be considered as a

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Aarseth further develops the analysis of simulation and fiction in computer games in his 2005 paper 'Doors and Perception: Fiction versus Simulation in Games' (Aarseth, 2005). He claims that 'fictional' content of videogames becomes ontologically different from the fictional content of the 'older media' as soon as it is constructed so that it can be acted upon (becomes a 'simulation').

To summarise the above, unlike what I describe here as 'interactive immersive cinema', most video games are not defined by narrative intention. All definitions of 'game' also agree that games are rule systems and are unconcerned with the function of representation.

However, there are more and more examples of contemporary video games where the authors explore the notion of space, time and interactive narrative and which are relevant for this research.

3.2.2.2. Computer games with the promise of interactive immersive cinema.

Experimenting with the representation of space and time.

Certain games use a larger proportion of 'fiction' or narrative elements in their structure: for example, games built on a quest concept; games employing emergent stories like 'The Sims' series (Electronic Arts, 2000 – 2009) and 'The Movies' (Feral Interactive 2005 – 2006); hybrid creations like artificial-intelligence interactive story 'Façade', combining voice-acting and 3d computer animation (Mateas and Stern, 2005); and games based on films, which will be discussed later.

narrative, just like any videogame session of Super Mario Bros. could also be viewed as a story (even if most would be quite strange by traditional narrative standards). And this is the reason why so many people insist to call videogames and simulations "interactive narrative": for an external observer, the outcome of a simulation is a narration. But the simulation itself is something bigger than narrative. It is a dynamic system that yes, contains thousands of potential "stories", but it is larger than the sum of its parts. The simulation itself is not a narrative, it is something different, in the same way that a kaleidoscope should not be understood as a collection of possible images but instead as a device that produces images according to certain mechanics. (...) Notice that 'I said that the outcome of a simulation is a narration "for an external observer". This is because in many simulations, particularly in videogames, the player does not feel like she is being told a story by a narrator, but is rather experiencing events as a personal experience. Unlike what happens in theatre, these events are not just being enacted, but the player has a certain degree of control over them. Phenomenologically, the player generally experiences videogames more as an alternative reality where she has certain freedom to act than as a story. (...) If simulations are not narratives nor "interactive narratives", what are they? The provisional definition that I am most happy with goes like this: "Simulation is act of modelling a system A by a less complex system B, which retains some of A's original behaviour". (...) We now have a powerful alternative to representation and narrative to explain and understand our world.' (Frasca, 2001, p. 1)

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Recent years have also seen several games, which truly blur the boundary between games and stories and position themselves as storytelling media. There, rules, simulation and quantifiable outcome are becoming less important than emotional and narrative experience that the player receives in the process of exploring the game.

One of these games is 'Braid' (2006)²² by Jonathan Blow. Visually, the game is simple, employing 2d animated characters (the artwork was done by David Hellman). The playworld is based upon the concept of time, which can be stopped, reversed, wrapped, on each different level in a different way. The plot seems simplistic at first - the central character needs to save a princess who is taken away by an evil monster - but the completion of the final level reveals a different meaning (the protagonist being the evil monster and the princess is being saved by a knight), and makes the whole story be perceived as a philosophical or poetic essay about time, responsibility, guilt, loss and memory, "bringing together the abstract parts of a complex puzzle, revealing deep moral and philosophical questions"²³ (Blow 2012).

New type of immersion.

The introduction of devices like Google glass and other types of head-worn displays has opened the possibility for new ways of viewer/player engagement with augmented or virtual reality. While this area lies outside of the scope of this research, the recording²⁴ of the experience of the player in the borderline examples like the game called 'Alone' (distributed in the Oculus RIFT platform²⁵) illuminate the important question how immersion affects the perception of space and time, which will be discussed in further chapters.

The gameplay presents a virtual room with a computer in an empty house ('house 1'). The player as protagonist ('protagonist 1') is offered to play in a horror game on the computer inside the game. As an in-game protagonist on the virtual screen ('protagonist 2'), the player explores an empty house ('house 2') and eventually

²² [http://http://braid-game.com](http://braid-game.com) (last accessed 27 December 2013)

²³ Jonathan Blow on future of video game industry. *CBS This Morning*. CBS. 2012-08-13. [Accessed 15 November 2013]

²⁴ <http://youtu.be/ZWVRXukjKUw> Published by VR Brotherhood [Accessed 21 December 2013].

²⁵ <http://www.entertherift.fr/gamecenter/en/game-200-alone-oculus-rift.html> [Accessed 29 December 2013]

'Chronovist' conceptualization method: exploring new approaches to structuring narrative in interactive discovers that it is a very dangerous place to be. As the game on the virtual computer screen becomes more and more intense, scary visions and sounds start appearing in the virtual house (1) itself. As reported by the reviewer of the game, this double-immersion erases the boundary between real and virtual, making the player think that these visions and sounds are happening in reality.

Storytelling approach and complex narratives in games.

Three other games - 'Antichamber' (2013) by Alexander Bruce, 'Echochrome' (2008) developed by Sony and 'Portal' (2007) developed by Valve Corporation - show new representations of temporal or spatial structures. 'Antichamber' presents the world of non-Euclidean space which the player needs to master in order to leave the room he initially finds himself in. 'Echochrome' is inspired by the work by M.C. Escher. The physics of its playworld changes depending on the camera's (and player's) perspective, allowing the puppet-like character to follow the path along otherwise separated shapes. 'Portal' is built around the player's ability to create 'portals' for transporting the protagonist from one place to another, preserving the speed of the movement. While the creation of a unique spatio-temporal continuum might appear similar to the approach discussed in this thesis, these games are not intended as narrative storytelling, and therefore their spatio-temporal continuum doesn't have narrative connotations.

Games by the influential game author David Cage (David de Grutolla) are another borderline example showing how games can venture into the territory of cinematic storytelling. 'Heavy rain'²⁶ (2010) and 'Beyond: Two souls'²⁷ (2013) are examples of complex interactive narratives which fully involve the player in the emotional journey of the protagonist. They use realistic graphics and a complicated system to capture actors' actions and expressions, presenting very realistic, engaging characters. They are story-boarded and edited in a deliberate cinematic way, employing a whole range of 'shots' and 'camera movements' - close-up, long shots, panorama etc. The script for

²⁶produced by Quantic Dream

²⁷produced by Quantic Dream

'Chronovist' conceptualization method: exploring new approaches to structuring narrative in interactive the game was written as a novel, based on personal emotional experience and was more than 2000 pages long²⁸.

The player is presented with choices, not only functional, but also ethical and/or emotional. Any decision that is made affects the development and the outcome of the story. Every step forward brings new narrative possibilities. The games have multiple paths and multiple endings.

Figure 3-1. *Beyond: Two souls* playback.

(Source: <http://www.gnomonschool.com/blog/3d-modeling/future-of-gaming-beyond-two-souls-age-motion-capture-technology>)

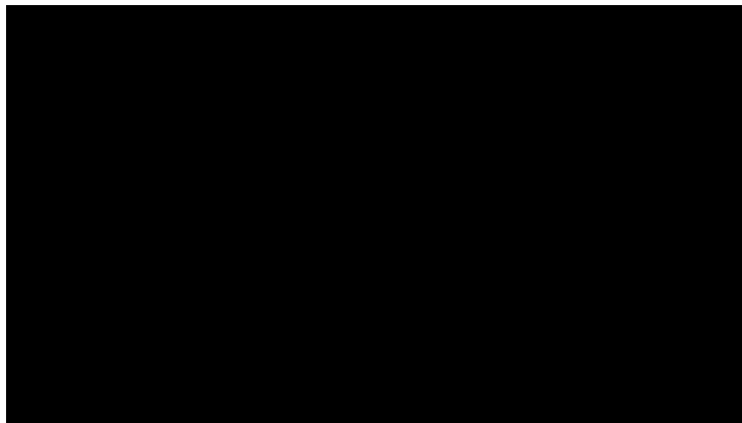
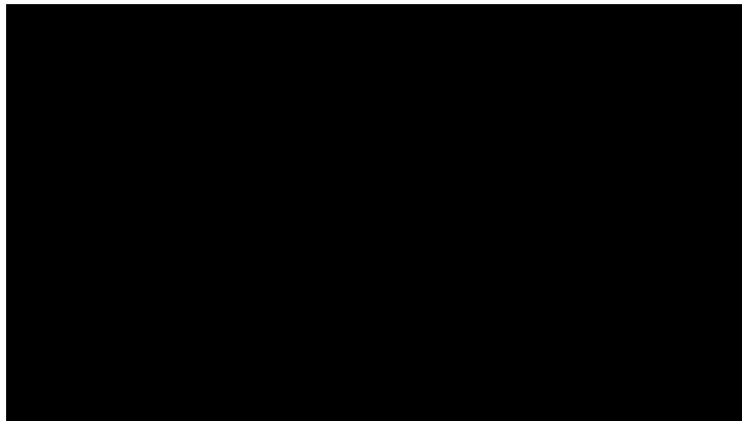


Figure 3-2. *Beyond: Two souls* screenshot

(Source http://beyond.eu.playstation.com/en_GB/home)



The Figures 3-1 and 3-2 show the actress Ellen Page with sensors attached to her face and body and the rendering of her character in the game. What is also important, and has been stressed by Cage in several interviews, is that these games are not geared

²⁸<http://www.stuff.tv/playstation-3/david-cage-tells-us-how-he-wrote-beyond-two-souls/feature> [Accessed 1 January 2014]

'Chronovist' conceptualization method: exploring new approaches to structuring narrative in interactive towards achievement and don't present the player with 'the game's over' screen but instead concentrate on the very process of interactively unfolding the story:

Slowly, the pieces of the puzzle come together, but it is not something that I told you. It is something that happens in the player's mind. He just connects the dots by himself. He sees the pieces of the puzzle coming together and he recreates the story by himself. I believe it is more powerful in many ways just because you are not passive in the storytelling; you are actually active in recreating the story.

(Cage 2013a²⁹)

In his speech at the DICE summit in Las Vegas in February 2013³⁰. Cage suggested that video games should transform themselves into a more meaningful creative medium:

When you think about it, you realise that many games have absolutely nothing to say [...] They are merely here to make you have a good moment, to trigger some adrenaline in your system, and that's cool... We need to put games at the centre of our society and our lives [...] It should be accessible to all, open to all themes and all genres, and talk about society in a meaningful way. It should be based on the journey and not the challenge, and be cross-platform [...] and finally become mass market. I think it is an amazing medium unlike anything else, and what we have here is absolutely different and unique, but I think we need to accept this idea of growing up and finally become adults.

(Cage 2013b)

In a different interview, he states that he believes films and games are merged media, and modern successful games gravitate heavily towards interactive storytelling³¹:

What I try to do is [...] to create something that is really based on interactive storytelling. Something based on choices and consequences. I try to put you in the shoes of the main protagonist of the film and let you decide how you want the story to go. So it is a different approach but I think that games already try to

²⁹ <http://www.joystiq.com/2013/08/22/no-game-over-in-beyond-two-souls-but-jodi-can-die/> [Accessed 13 December 2013]

'Chronovist' conceptualization method: exploring new approaches to structuring narrative in interactive mimic films in many ways.
(Cage 2013c)

The analysis of narrative elements of games written by David Cage is a far bigger subject than can be covered in the contextual overview, but it is important to stress here that the tendency towards narrative and representation becomes more and more powerful in contemporary game creation. I believe that the framework introduced in my research can help and stimulate further development in this direction and could therefore be useful not only for interactive immersive cinema but could also be extend to the conception and creation of video games.

3.2.2.3 *Storytelling games and interactive immersive cinema.*

The table on Figure 3-3 summarises the general differences between interactive immersive cinema and videogames.

Figure 3-3. Differences between interactive immersive cinema and videogames.

	videogames	interactive immersive cinema
Relationship to reality	simulation	representation
Main purpose	entertainment	storytelling
Types of interlocutor's engagement	interactivity immersion	interactivity immersion
Narrative structure	optional	core
Rules	core	optional
Goals	optional	optional
Competitiveness	optional	absent
Outcome	quantifiable (optional)	non-quantifiable
Cinema elements	optional (live-action footage, POV, 'cut scenes', montage)	yes (live-action footage, POV, 'cut scenes', montage)

³⁰ <http://www.theverge.com/2013/2/6/3960630/david-cage-video-game-industry-grow-up-already> [Accessed 15 December 2013]

³¹ <http://blog.eu.playstation.com/2013/09/27/beyond-two-souls-david-cage-talks-the-future-of-interactive-entertainment-in-sydney> [Accessed 15 December 2013]

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However, as has been demonstrated in the examples above, more and more contemporary video games lean towards storytelling and representation. The analysis of how their narrative structures are constructed and executed informed this research.

3.2.3. Cybertext, hypertext and hypermedia.

In order to identify different types of interactive electronic media, the concepts of hypertext, hypermedia and cybertext were introduced and developed between the 1970s and 1990s. I will draw a distinction between these listed forms and 'interactive immersive cinema' and see whether any of their elements, characteristics and/or technics can be useful for the purpose of this research (the intended creation of a new narrative model).

3.2.3.1. Hypertext and hypermedia.

The terms hypermedia and hypertext were suggested by Ted Nelson and first explicitly described in his book 'Computer Lib/ Dream Machines' (Nelson, 1974, Nelson, 2003).

Hyper-media are branching or performing presentations, which respond to user actions, systems of prearranged words and pictures (for example) which may be explored freely or queried in stylized ways. They will not be "programmed," but rather designed, written, drawn and edited, by authors, artists, designers and editors. (To call them "programmed" would suggest spurious technicality. Computer systems to present them will be "programmed.") Like ordinary prose and pictures, they will be media; and because they are in some sense "multi-dimensional", we may call them hyper-media, following mathematical use of the term "hyper-".

(Nelson, 2003, p. 313)

He further continues:

"Hypertext" means forms of writing that branch or perform on request: they are best presented on computer display screens. In ordinary writing the author may break a sequence for footnotes or inserts, but the use of print on paper makes some basic sequence essential. The computer display screen, however, permits footnotes on footnotes on footnotes, and pathways for any structure the author

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wants to create. Discrete, or chunk style, hypertexts consist of separate pieces of text connected by links.

(Nelson 2003, p. 314)

After having defined the form, Nelson suggests several types of hypertexts:

1/'discrete hypertexts' – or hypertext proper, a branching form of writing, presented on computer screen;

2/'performing hypergrams' - described by Nelson as 'branching pictures' and showing the connections and consequences like, for example, between a user-changeable angle and a related bar graph of its trigonometric function, or, in another example, 'queryable illustrations';

3/innovative 'stretchtext' with a 'zoom-in' function which transforms a shorter and less detailed text into something longer and more explicit with new words and phrases popping into the gaps;

4/'hypermap' which zips up or down;

5/and even hyper-comics branching on the user's request: 'different characters could be used to explain things in different ways, with the student able to choose which type of explanation he wanted at a specific time' (Nelson, 2003, p. 316).

The concept took off and the word 'hypertext' was used by Berners-Lee to describe his invention - the World Wide Web:

HyperText is a way to link and access information of various kinds as a web of nodes in which the user can browse at will. It provides a single user-interface to large classes of information (reports, notes, data-bases, computer documentation and on-line help). We propose a simple scheme incorporating servers already available at CERN... A program, which provides access to the hypertext world we call a browser...

(Berners-Lee, 1990)³²

In the modern discourse the terms 'hypertext' and 'hypermedia' are used to describe a (often open-ended and extendable) text, fragments of which are interlinked (by

³² <http://www.w3.org/Proposal.html> [Accessed 13 February 2011]

'Chronovist' conceptualization method: exploring new approaches to structuring narrative in interactive hyperlinks), allowing for a non-linear exploration of the whole. George Landow provides an accepted modern definition of 'hypertext' in his book *Hypertext* (Landow, 2006), adding the term 'lexia' borrowed from Ronald Barthes to describe fragments of texts or media connected by the links:

Hypertext, as the term is used in this work, denotes text composed of blocks of text - what Barthes terms a lexia - and the electronic links that join them. Hypermedia simply extends the notion of the text in hypertext by including visual information, sound, animation, and other forms of data. Since hypertext, which links one passage of verbal discourse to images, maps, diagrams, and sound as easily as to another verbal passage, expands the notion of text beyond the solely verbal, I do not distinguish between hypertext and hypermedia. Hypertext denotes an information medium that links verbal and nonverbal information.

(Landow 2006, pp. 3-4)

There are many examples of hypertext and hypermedia structures used as storytelling tools.

One of the early examples of hypertext fiction is Michael Joyce's text 'Afternoon: A Story' (Joyce, 1990). At present a company called 'Eastgate' concentrates on creating new hypertext technologies (they have developed a hypertext creation tool called 'Storyspace') and publishing serious hypertext, fiction and non-fiction.³³

Hypertext can be an open-ended, ultimately expandable network of lexia ideally suited to participatory culture; or can be a limited, authored structure aiming to provide a reader with narrative experiences (hypertext fiction). Hypermedia can employ still images, computer animation, live-action and documentary footage. It has been argued earlier that this research concentrates on 'authored' media as opposed to participatory media, and therefore this discussion about hypertext/hypermedia properties addresses 'authored' hypertext, or hypertext fiction.

While sharing the narrative intention and the possibility of using live-action footage with what I define here as 'interactive immersive cinema', I argue that

³³ www.eastgate.com [Accessed 24 March 2011]

'Chronovist' conceptualization method: exploring new approaches to structuring narrative in interactive hypertext/hypermedia fiction is topologically different. Hypertext presumes a different materiality and its relation to the physiology of bodily reception of meaning as it doesn't require and/or create immersion.

Following the suggestion by Anne Mangen (Mangen, 2008) and Ryan's writing on immersion, there are two distinct types of immersion: 'technologically enhanced immersion' creating the sense of presence in a virtual world through technological features, material devices and visual features providing haptic feedback and a sense of agency (as described earlier in relation to presence, immersion and interactivity); and 'phenomenological immersion' reliant on the reader's mental, cognitive abilities to create 'that fictive, virtual (in the figurative sense of the word) world from the symbolic representations – the text, whether purely linguistic or multi-modal, digital or print – displayed by means of any technological platform' (Mangen, 2008, p. 407).

I suggest that 'interactive immersive cinema' aims to employ both of these types of immersion. On the contrary, hypertext does not aim to provide a 'technologically enhanced immersion' and fails to provide 'phenomenological immersion'. The tactility of interacting with a computer via mouse, keyboard and clicks creates an obstacle for unobstructed perception and absorption in the text:

The links in a hypertext fiction present themselves as an experiential potential, a latently accessible actualisation of something currently unavailable, which becomes readily accessible with the click of a mouse. The sensory– motor affordances of the computer make it very easy to rekindle our attention, getting access to something beyond our present experience. As such, text or icons that yield (i.e., hot spots) afford haptic interaction with the computer. We experience these as links to be clicked on, and such affordance is necessarily incompatible with phenomenological immersion

(Mangen, 2008, p. 410)

Hypertext empathizes technology and the materiality of the platform; links are often visually distinguished in the text; the interface – mouse, keyboard, clicking, computer screen - remain its assertive presence between the reader and the text. The human-technology relation in hypertext is of the 'alterity' kind, according to the classification

'Chronovist' conceptualization method: exploring new approaches to structuring narrative in interactive suggested by phenomenologist Don Ihde quoted by Mangen (Mangen, 2008 p.414). Mangen writes that 'in such a relation, both the perceptual [when technology is experienced as an extension of the body] and the hermeneutic [when technology assumes representational function, like, for example, the print of a book] transparency has gone, and is replaced by a relation with technology as 'other''(Mangen, 2008, p. 415). This continuous material presence of the technology prevents or destroys possible 'phenomenological immersion' in hypertext. Aarseth describes the same problem of 'technological presence' in certain types of texts (insisting that hypertext is just one of the possible cases) with the help of the term 'ergodic'.

3.2.3.2. Cybertext

The term 'ergodic' was suggested by Aarseth (Aarseth, 1997) to describe a text, the reading of which requires a non-trivial effort. He calls this type of text 'cybertext'. He states that the concept 'doesn't limit itself to the study of computer-driven (or 'electronic') textuality', but can be applied to a variety of texts which require the reader's effort for actualisation:

During the cybertextual process, the user will have effectuated a semiotic sequence, and this selective movement is a work of physical construction that the various concepts of "reading" do not account for. This phenomenon I call *ergodic*, using a term appropriated from physics that derives from the Greek words *ergon* and *hodos*, meaning "work" and "path". In ergodic literature, nontrivial effort is required to allow the reader to traverse the text [...] When you read from a cybertext, you are constantly reminded of inaccessible strategies and paths not taken, voices not heard. Each decision will make some parts of the text more, and others less, accessible, and you may never know the exact results of your choices; that is, exactly what you missed.

(Aarseth 1997, Introduction)

While Aarseth wants to keep 'ergodic texts' within the literary domain and insists that his aim is develop a framework for the analysis of a new type of literary text, he also suggests that cybertext presents 'a *perspective* on all forms of textuality', since it is defined by the way in which the text functions, and not by its medium.

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If one accepts the above definition, cybertext becomes a general term that could be applied to a variety of ‘ergodic texts’ – from hypertexts and games to online multi-user dungeons (MUDs). Therefore, at first sight the framework that Aarseth developed could be used in the analysis of interactive immersive cinema. However, there is one very important difference, which would render the use of Aarseth’s definition and framework inappropriate for this research. Cybertext, like hypertext, does not rely on or require immersion. On the contrary, since to traverse an ergodic text requires ‘non-trivial effort’ and this effort constitutes, according to Aarseth, its defining characteristic, it raises awareness of the materiality and technology of the text and promotes the reader’s detachment from it.

This line of argument reaches the same conclusion as the discussion about technological materiality in hypertext³⁴ - since ergodic is the opposite to immersive, cybertext (and its subtype hypertext/hypermedia) is topologically different (has different space, dimension and transformation characteristics and follows different rules) from what is defined here as ‘interactive immersive cinema’. Nevertheless, the analysis of the network structure of hypertext/cybertext is useful for the discussion of possible narrative models in interactive immersive cinema.

The table on Fig.3-4 summarises the differences between authored hypertext/hypermedia/cybertext fiction and ‘interactive immersive cinema’.

Figure 3-4. Hypertext/hypermedia/cybertext fiction and ‘interactive immersive cinema’.

	‘AUTHORED’ HYPERTEXT/HYPERMEDIA	INTERACTIVE CINEMA	IMMERSIVE
Relationship to reality	representation	representation	
Narrative intention	yes	yes	
Types of interlocutor’s engagement	Technology-empathised interactivity	interactivity and sense of agency connected with technologically enhanced immersion; phenomenological immersion	
Narrative structure	Network: links between blocks of text or ‘lexia’	Various structures possible; network structure is one of them	
Cinema elements	possible (as separate lexia)	yes	

³⁴ Hypertext will be referred to in the discussion about interactive script-writing tool in the further chapters of this research.

3.2.4. Other areas.

3.2.4.1. iPad experiments

The technological platform for these interactive movies has unique qualities, and I put these examples into a separate category.

The first four interactive iPad movies released under the title of 'Touching Stories' (Domani Studios, USA, 2010) explore different facets of the iPad interface. The intentions declared in the 'behind the scenes' video³⁵ are to show the possibilities of the platform and to transport the viewer inside the stories. Not all of the films are equally innovative. For example, 'The Most Interesting Couple in Britain' includes menu options which draw attention to the interface in the way described before, thereby breaking the direct connection between the viewer and the story. 'Triangle' uses 'hot spots' which are pointed out to in the accompanying description,³⁶ again, becoming an intermediate between the viewer and the work.

Among the four, it is 'All Ends, Ends All' that does make a conscious attempt to acquire transparency and to bridge the story-world and reality by using haptic simulations to propel the action in the story – the player needs to shake the iPad to run away from the men shooting at him/her and dial numbers on an interactive phone in a phone booth.

Another example of an interactive iPad narrative is Cornelia's Funke Mirror app³⁷ (2012) designed in collaboration with Mirada³⁸. This interactive application for iPad is based on Funke's novels and short stories and employs live-action footage of actors, various artwork - drawings, shadows and complex sound design, written texts and audio-recordings, as well as additional materials exploring the story world, additionally created by the author. The surface of the iPad is treated as a 'mirror' through which the viewer/ reader enters the story. Funke describes the application as a unique way to expand the storyworld created in her books and prefers it to movie adaptation which

³⁵ <http://www.youtube.com/watch?v=HJWuF> [Aast accessed 16 February 2011]

³⁶ 'Triangle' by director Tom Rouston: 'The scene plays out in a seedy hotel room but most of the action happens through the reflection in a TV screen. Users are able to peel back layers of the story depending on how you interact with the film. Search out different elements in the motel room, such as the telephone and door placard to unlock hints, flashbacks and clues.' [online] Available from: <http://itunes.apple.com/us/app/touching-stories/id376922506?mt=8#> [Accessed 16 February 2011].

³⁷ <http://mirrorworldnovels.com/app> [Accessed 3 December 2013]

³⁸ www.mirada.com [Accessed 3 December 2013]

'Chronovist' conceptualization method: exploring new approaches to structuring narrative in interactive inevitably reduce the content in order to suit temporal, commercial and censorial requirements³⁹ (Funke 2013).

While none of these examples can be described as 'interactive immersive cinema', iPad does allow for a range of haptic engagement between the user and the pad – from conventional pointing and clicking on a virtual keyboard to multi-stroking and responsiveness to spatial orientation change and other physical actions by the user, and offers a potentially promising interface for interactive immersive films. When developing a new narrative model for interactive immersive cinema, this research will aim to extend the application of this model to iPad interactive movies.

3.2.4.2 *Trans-media experiments*

Trans-media is a relatively recent term used to describe storytelling across multiple platforms in such a way that the whole experience is greater than the sum of the parts. The authors employ mixing and joining different genres and media and tell the story across multiple platforms so that the whole experience of the reader/viewer/player is greater than the sum of the parts. It can be a prequel or a sequel of the story with the same characters told in a different platform, or a particular story expanded to different platforms. One of the examples is Star Wars where each platform - movies, books, computer games, internet site - gives a new insight into the common story world and develop individual stories which belong to the same universe.

Trans-media renderings of narrative can benefit from chronotopic approach, even if trans-media doesn't require immersion.

3.3. Conclusion

This chapter defined what can be called 'interactive immersive cinema' and considered the problem of authorship for interactive media. I have also looked at a variety of examples of interactive digital media outside interactive audio-visual installations to identify the boundaries and to contextualise the area of interest within contemporary new media discourse.

³⁹ http://www.corneliafunke.com/index.php?page=schreibhauskurier_artikel&lang=en&id=10 [Accessed 29 December 2013]

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The absence of immersion puts many works discussed in this chapter outside what I defined here as 'interactive immersive cinema'. However, these works demonstrate features relevant to this research: non-linear plots, unusual renderings of space and time, new types of immersion. The analysis of what kind of narrative structures are employed in these texts, and how interactivity and the use of live-action footage are combined, informs the quest for new narrative models as well as the investigation of how chronotope structure can be expressed in interactive audio-visual media.

I will return to some of these examples in Chapter 9 when I outline how many areas discussed in this chapter will benefit from the 'chronovist' conceptualisation method.

4. Chapter 4. Existing practical approaches to narrative construction in interactive media.

The purpose of this chapter is to argue the need for a new approach to structuring narratives in interactive immersive cinema. I will summarise existing research and analyse existing conceptual approaches to narrative construction in interactive audio-visual media and identify their limitations.

Manovich suggests that there are two contrasting approaches to creating work in new media: one is a multimedia database accessed through the right type of interface; another is 'navigation through spatialized representations':

The first approach is typically used in self-contained hypermedia and Web sites — in short, whenever the main goal is to provide an interface to data. The second approach is used in most computer games and virtual worlds. What is the logic here? Web sites and hypermedia programs usually aim to give user efficient access to information, while games and virtual worlds aim to psychologically "submerge" the user in an imaginary universe. It is appropriate that database has emerged as perfect vehicle for the first goal while navigable space meets the demands of the second. It accomplishes the same effects, which before were created by literary and cinematic narrative.

(Manovich, 2002, p. 192)

While this is broadly true, I would argue that it is too general for the purpose of this study. The classification used in this research is specific to the practice of narrative construction in interactive media and is based on an analysis of existing works and software, as well as on research papers in the subject. I have, instead, identified three main approaches to narrative creation in interactive audio/visual media, which I call: the 'story-world (sandbox) model', the 'creation model' and the 'montage model'. These models describe three different concepts, which, in turn, affect how procedural authorship is setup in software, and how authors approach the process of designing their interactive piece.

4.1 The 'story-world (sandbox) model'.

4.1.1. Description.

In what I call the 'story-world (sandbox) model' the story world consists of predefined reiterative elements – characters, spaces/settings and objects, which are assigned various attributes allowing for conflicts and development, characters usually having dynamic goals. The visual characteristics of these elements are pre-determined and pre-designed and are normally assembled 'live' as 2d or 3d computer animation. Here, for example, is how visual implementation is achieved in Michael Mateas and Andrew Stern's 'Façade':

Façade real-time rendered 3D story world is implemented in C++ with OpenGL. Character animation (body and face) is achieved through a mixture of procedural animation and layered keyframe animation data. The story world consists of the animated bodies of Grace and Trip and their apartment, primarily a large furnished living room where the action of the drama is designed to take place. The interface is first-person in 3D space, navigated with arrow keys.

(Mateas and Stern, 2003)

The heart of the model is a 'story engine' – normally a combination of 'autonomous agents' (enacting a role in a story world through pre-scripted personality, emotions, beliefs and goals) and a 'drama manager' or 'planner' (intelligent disembodied agent) who responds to the user input by setting the story world in motion according to employed algorithms and (re-)generated narrative content, presenting the user with an unfolding narrative.

In this model the world and the potential for stories exist in the form of algorithms (narrative paradigms) and variables (elements with attributes), before and independently of any interaction.

4.1.2. Background

Attempts to create intelligent systems able to control everything that happens in the virtual story-world, and to adapt the story according to the specifics of interaction with each interlocutor, can be traced back to the late seventies.

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The origins can be found in the group lead by Roger Schank at Yale University working in combining Linguistic and Narratology with the perspective of Cognitive Sciences. This group developed several computer applications, including the non-interactive short story generator 'Tale-Spin', described in the author's paper (Meehan, 1977) and recently analysed in detail by Noah Wardrip-Fruin (Wardrip-Fruin, 2008). The story engine in 'Tale-Spin' uses a simulation of 'goal-directed behaviour of people as characters'.

Another famous legacy non-interactive AI story generating system 'Minstrel', developed by Scott Turner, constructed stories using the simulation of 'goal-directed behaviour of people as authors' (Wardrip-Fruin, 2006a). 'Minstrel' employed 'case based reasoning', suggested by the artificial intelligence scholars Schank and Riesbeck in 1989 and explained by Noah Wardrip-Fruin in his article about 'Minstrel':

The basic idea of CBR is in some ways quite close to that of scripts: in the main people do not decide what to do in each situation by reasoning from first principles, but rather by drawing on previous knowledge. (...) According to CBR theory, humans have three major types of cases we work with. There are "ossified cases" that have been abstracted to the point where they are essentially rules, such as proverbs. There are "paradigmatic cases," each of which turns out to be the only experience we have that is relevant to a particular current situation, and which we adapt in order to understand the new situation. Finally, the most complex structures are "stories," which Schank and Riesbeck characterize as "unique and full of detail, like paradigmatic cases, but with points, like proverbs." The continuing reinterpretation of stories is described as the "basis of creativity in a cognitive system".

(Wardrip-Fruin, 2006a)

Turner builds his story-telling engine on this model of the 'continuing reinterpretation of stories':

'Minstrel' begins storytelling with an initial goal to 'tell a story'. This goal breaks down into sub-goals including selecting a theme, illustrating a theme, applying drama goals, checking the story for consistency, and presenting the story to the

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reader. At each cycle, 'Minstrel' selects the author-level goal with the highest priority from the goal agenda and passes it to the problem solving process. Problem solving finds a plan for that goal and executes it. (...) As new scenes are created, they are added to the current story. As new goals are created they are added to the goal agenda. Storytelling finishes when the goal agenda is empty.

(Turner, 1992, pp. 77-78)

The third legacy, AI story-generating system developed around the same time by Michael Lebowitz, was called 'Universe'. The difference between 'Universe' and 'Minstrel' is that in 'Universe', as Wardrip-Fruin notes:

The system is not presented as a simulation of a model of human cognition. Rather, it is presented as a means of generating a universe of characters and an ongoing plot that interconnects them. In fact, in lieu of any cognitive science theory, Lebowitz writes: "Our methods are based on analysis of a television melodrama" (Lebowitz, 1985, 483). This allows 'Universe' to be designed specifically for the generation of stories, and of a particular style of stories, rather than for the simulation of the behavior believed to generate stories.

(Wardrip-Fruin, 2006b)

These early systems showed the limitations of AI story generation through the statistical examination of large pools of data. However, they paved the way for the development of modern interactive story engines - 'autonomous agents' and 'drama managers', simulating creative practices employed by human writers, as described further.

4.1.3. Types.

Peinado (Peinado, 2006) suggests that there are at present three main types of IDS (interactive digital storytelling) or IDN (interactive digital narrative) systems. The first type is:

Pure emergent narratives in a completely simulated environment populated with interactive characters provided with dramatic goals.

(Peinado, 2006, p.4)

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Examples of the systems are: 'FearNot!' the anti-bullying virtual learning environment (Aylett et al. 2005), the character-based storytelling engine 'Unreal' (Cavazza, 2001).

The second type is:

Systems with centralized reasoning based on rules, cases, planning algorithms or specific-purpose algorithms.

(Peinado, 2006, p.4)

Examples are: the story goal-based planning 'Mimesis' (Young et al. 2004), the dilemma-based system (Barber and Kudenko, 2008) and the suspense-based system (Cheong and Young, 2008).

The third type is:

Distributed reasoning using software agent (or multiple agents) to implement the characters of the story, controlled by a planner-agent or a stand-alone protagonist-agent who shapes the story.

(Peinado, 2006, p.4-5)

Examples are 'IDTension' (Szilas 1999; Szilas 2007), 'Façade' (Stern and Mateas, 2003).

In fact, according to the authors' statement, 'Façade' – the most complete and successful system among those listed - is a hybrid system, which employs both 'procedural simulation' – or what is called here the 'story world' model – in combination with the 'structured narrative' – or what is called here the 'paths model' (see 4.3.2). It is a simulation consisting of the characters simulated as believable agents with scripted goals, traits, emotions etc.), the drama manager, which 'continuously monitors the simulation and proactively adds and retracts procedures (behaviours) and discourse contexts'. Further these simulation updates are:

organized into *story beats*, each a collection of behaviours tailored to a particular situation or context but still offering a non-trivial simulation space [...] Beats are annotated by the author with preconditions and effects on the story state, instructing the drama manager when they make sense to use, in the interest of creating an overall dramatic narrative - a *plot*. [...] So at a high level, Façade

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collection of beats and sequencing rules implicitly define a complex narrative graph - a graph with a link structure complexity making it intractable to manually, explicitly, define.

(Mateas and Stern, 2003)

The intention of the authors was to create a simulation that could provide the interlocutor with satisfying narrative experiences about human relationships.

Many systems have not been developed to fully working universally accessible software, but remain at the prototype level.

4.1.4 Object-oriented story construction

Object-oriented story construction suggested by several researchers and designers (for example, Eladhari, 2002) is an attempt to fine-tune the 'story world' model suggesting story-caring objects as main narrative-producing elements. The properties of the objects change with the progression of the interlocutor's exploration, and the encounters with these objects. The present state of the objects 'in the now of the playing' and the sequential order created by the progression of encounters constitute the discourse.

4.1.5. Application and characteristics.

The 'story world (sandbox) model' is used in the majority of video games and simulation-based virtual learning environments.

Because of its mode of construct as outlined in 4.1.1, the implementation of this model requires computer-generated imagery and therefore cannot be used with live-action footage – the story-world, including the characters, is rendered 'live' as a response to the user's interaction.⁴⁰

In this model the author does not write stories or construct narratives, but through procedural authorship (by constructing algorithms and defining variables) sets up rules and potential for them. The possibilities for different narratives are actualized during the interaction with the interlocutor. Procedural authorship allows for the construction of a model world with highly specific and conceptualised rules. For example, this

⁴⁰ It is possible, however, to employ pre-recorded live-action audio synced with computer animation as has been done in 'Façade'.

'Chronovist' conceptualization method: exploring new approaches to structuring narrative in interactive model can lead to the creation of a story-world with alterations to the laws of physics or with social behaviour patterns dramatically different from real life.

4.1.6. Limitations.

It is important to stress that by dissecting narratives into elements and algorithms and thus removing them from their historical and chronological context, the 'story world model' stays firmly within the paradigm of modernism and structuralism.

Another limitation of this model is the hard-to-overcome limitation of AI-based story-telling engines (there is no complete and finite algorithm explaining how stories are constructed).

A further limitation lies in the impossibility of hand-authoring enough behaviours and situations to ensure a complex, meaningful and inexhaustible narrative experience for the interlocutor. For example, the authors of 'Façade' Mateas and Stern admit:

The Façade system is generative in the sense that it mixes and sequences behaviours in sophisticated ways, as this paper will describe, but it does not generate the individual behaviours. Hand-authoring behaviours is a time consuming process: by the time Façade' is done, we will have spent two man-years on authoring alone, but even this results in only a 20 minute one-act play re-playable 6 or 7 times before it is exhausted.

(Mateas and Stern, 2003)

There is also yet another – ontological - limitation. The 'story-world models' produce models - simulations - of narratives that do not relate to a 'story', and have no need of a story to relate to. The three-part unity: 'story' – 'narrative' – 'narration'⁴¹ is reduced to two parts: 'narrative' – 'narration'. The resulting narratives are reiterative (the same variables used in the same algorithm producing exactly the same result) and do not represent but, rather, simulate reality.

⁴¹ Marie-Laure Ryan, following the modern conventions, suggests the following definitions: if we consider the 'story' to be a sequence of events (real or fictional) or a mental image, 'a cognitive construct that concerns certain types of entities and relations between these entities', the 'narrative' is representation of the story and the 'discourse' (or 'narration') is the act of an actualisation of the narrative in the chosen media (Ryan, 'Narrative', in Herman, 2008, p.347)

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4.1.7. Summary.

To summarise the characteristics of the 'story-world (sandbox) model':

- it is impossible to use live-action as the visuals are live-rendered according to procedural algorithms;
- authorship is expressed through pre-defined variables (elements of the story-world) and algorithms (arrangement of these elements), created according to author-defined storytelling paradigms;
- even the most sophisticated algorithms - AI story engine/ agents - have limitations and cannot provide a definite model of how stories are constructed;
- algorithm-based story narratives are devoid of historicity;
- the behaviours of hand-authoring agents is very labour-consuming;
- despite an infinite number of combinations, the elements themselves are reiterative in nature;
- produced narratives do not represent, but simulate reality.

4.2 The 'creation model'.

4.2.1. Description.

The 'creation' model interprets the input from the interlocutor and responds with 'live' computer-generated imagery produced according to pre-defined algorithms, which create short non-verbal narratives.

While the use of 'story-generating' algorithms seems similar to the previous model, there are significant differences. There are no pre-defined elements of the story-world with variable attributes. Algorithms do not need to be based on the analysis of narrative situation and can be of an abstract nature. 'Live' computer-generated imagery does not preclude interaction and is non-reiterative in nature.

4.2.2. Application.

This model cannot be used to create complex long narratives. What it produces can be called 'interactive non-verbal poetry'.

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Early implementations of this model can be found in the works of the artists Christa Sommerer and Laurent Mignonneau - 'A-volve'_(1993-94),⁴² 'Phototrophy' (1995),⁴³ 'Trans Plant' (1995)⁴⁴ and others. For example, in 'Phototrophy' (1995) virtual computer-generated animated insects are drawn to the movement of a flashlight in a visitor's hand. They flock in a cloud following the light projection on a screen, and are able to 'propagate' (more and more 'insects' are generated). They 'die' if the light goes off or 'burn to death' when reaching the hot spot in the middle of the light circle. The interface – the flashlight – effectively draws the visitors into the middle of the piece, making them the protagonists of the unfolding event. The visitor is made responsible for the wellbeing of an insect colony following his/her light, and has to take a conscious decision to switch the light off, thereby ending their lives and concluding the narrative.

4.2.3. Summary.

The characteristics of this model are:

- authorship is expressed through algorithms linking the interpretation of the user's input and live generation of procedural computer imagery;
 - the story-world and its fabric do not exist prior to interaction with the interlocutor; they are created/ actualized through the interaction;
 - algorithms can be based on simple real-life narratives (birth-growth-reproduction-death);
 - this model produces simple non-verbal narratives;
 - the resulting 'narratives' are 'live-generated' and non-reiterative in nature;
 - produced narratives can represent reality;
 - it is possible to use live-action footage as a source for computer-generated images.
- However, since the visual elements are created as live-rendered computer animation, the use and significance of live-action footage is limited.

⁴² Sommerer, C., Mignonneau, L., 1994, 'A-Volve' documentation Available from: <http://www.interface.ufg.ac.at/christa-laurent/WORKS/FRAMES/FrameSet.html> [Accessed January 12, 2011].

⁴³ Sommerer, C., Mignonneau, L., 1995, 'Phototrophy' documentation, Available from: <http://www.interface.ufg.ac.at/christa-laurent/WORKS/FRAMES/FrameSet.html> [Accessed January 12, 2011].

⁴⁴ Sommerer, C., and Mignonneau, L., 1995 'Trans Plant' documentation, Available from: <http://www.interface.ufg.ac.at/christa-laurent/WORKS/FRAMES/FrameSet.html> [Accessed January 12, 2011].

4.3 The 'montage' model.

The 'montage' model presumes two kinds of elements: units of visual or audio material (which are sometimes referred to as 'lexia', 'granules' or 'nodes') and connections between them. I use the word 'montage' to describe the outcome of the interaction: a succession of images and sounds, arranged or 'edited' together and played to the interlocutor. Depending on the preference for one or another kind of element, the montage model can be divided into two sub-types: 'annotated database' model and 'paths' model.

4.3.1 The 'annotated database' model.

4.3.1.1. Description.

The 'annotated database' model consists of a database⁴⁵ of annotated visual and audio material ('granules') and an intelligent story complier arranging these 'granules' according to scripted rules in response to the interlocutor's input. The rules take into consideration attributes assigned to audio/visual granules and match them with each other and the attributes assigned to the viewer's input, thus creating a live-edited progression of images and sounds.

Before describing the possible applications of the 'annotated database' model, it is necessary to address the notion of database in new media, as developed by Lev Manovich. Manovich calls database 'a new symbolic form of a computer age':

Literary or cinematic narrative, an architectural plan and database each present a different model of what a world is like. It is this sense of database as a cultural form of its own which I want to address here. Following art historian Ervin Panofsky's analysis of linear perspective as a "symbolic form" of the modern age, we may even call database a new symbolic form of a computer age [...], a new way to structure our experience of ourselves and of the world.

(Manovich, 2001, p.195)

He contrasts 'narrative' and 'database' stating their incompatibility: database represents the world as a list of unrelated items; a narrative represents the world as a cause-and-

⁴⁵ The databases can be of different kinds - hierarchical, network, relational and object-oriented. Each type uses different models to organize, unite and distinguish data, and the resulting system can be quite complex.

'Chronovist' conceptualization method: exploring new approaches to structuring narrative in interactive effect progression of related but unordered events. He claims, however, that in new media the notions of both 'narrative' and 'database' are redefined by the medium. Database is the material and organizational basis of a range of cultural forms existing in new media; it can support (a becoming implicit) narrative. Manovich uses the paradigm/ syntagm model suggested by Saussure and expanded by Barthes, where the syntagm is an actualized linear combination of signs, and the paradigm is the sets or groups of similar signs, from which the actualized signs have been chosen. In new media:

database (the paradigm) is given material existence, while narrative (the syntagm) is de-materialised. Paradigm is privileged, syntagm is downplayed. Paradigm is real, syntagm is virtual.

(Manovich, 2001, p.203)

However, annotating data in a database establishes relations between the items and imposes a potential narrative structure, thus downplaying the paradigm and re-privileging the syntagm, and departing from the model described by Manovich.

4.3.1.2. Application.

One example of 'annotated database' is the 'Korsakow System'⁴⁶ – a freely available interactive narrative creation tool, which allows an author to annotate custom video clips with verbal 'labels'. While a clip is playing, the viewer is presented with words-labels. Clicking on a label selects the next clip to be played, chosen from the annotated database according to the label.

Unifying Theory of the Universe

My experience with the Korsakow system was in my interactive work 'Unifying Theory of the Universe'. I used short clips from life-action footage of a 16mm short film that I made. All clips (of different duration) were annotated using different words commenting emotionally, visually or narratively on what was happening on screen. As the clip progressed the words were displayed each for a different duration of time, not congruent with the duration of the clip. Some words lingered for longer, some quickly

⁴⁶ The Korsakow System is an open-source software developed by Florian Thalhoffer. It first appeared in 2000; the current version is available from: <http://korsakow.org> [Accessed 1 October 2014]

'Chronovist' conceptualization method: exploring new approaches to structuring narrative in interactive disappeared, some overlapped. The urge to choose one of the words was in conflict with the viewer's desire to see the entire clip, thereby missing some of the possible connections. If a word was chosen (clicked) the viewer was taken to another clip that shared that specific metadata characteristic.

Pia Tikka.

An example of an unconventional 'annotated database model' (combined with a media data manager) can be found in the work of Pia Tikka. Her work and writings will be referred to in more detail later, but here I will briefly describe her piece entitled 'Enactive Cinema – Obsession' (Tikka, 2005, Tikka, 2008).⁴⁷

Live-action cinematic material from a narrative short story 'Obsession' is broken into clips – she calls them 'protonarratives' – which are assigned 'a parametrically definable set of characteristics and can be used as the building blocks of a number of different narrative paths':

Each cinematic take will be analysed with respect to 1) its emotional parameter value, and 2) the orientation of the character with respect to the camera, reflecting the attitude attributed to the narrative. Analysed images are assigned a position in the narrative story-world map (...) The list consists of analytical and descriptive properties drawn from Eisenstein's theories, Thompson and Bordwell's neoformalist film analyses, Lakoff and Johnson's metaphor theory, and Gestalt theory.

(Tikka, 2005)

Tikka uses personal monitors to collect body data – heart and breathing rate – to measure, as she claims, the viewer's emotional response to the projected video clips. The only choice the viewer has is the choice of screen, which she/he prioritises by changing the position on the chair. During the screening the bio data is analysed by the algorithmic 'montage-machine' to determine which video clips are to be projected to the visitor on the main screen, and which direction the story is taking.

⁴⁷ The piece is documented online on Tikka's website <http://lumen2.uiah.fi/obsession/installation.html>, [Accessed 17 February 2011], and in her writing (Tikka, 2005, Tikka, 2008).

Special case – the 'diorama model'.

This example constitutes a special case for an 'annotated database model' and has been developed for a specially designed cinema environment, iCinema, in Australia⁴⁸. It is, though not explicitly acknowledged, a development on Aspen Movie Map. A continuous scene is rendered as a 360-degree virtual reality re-enactment of an event, allowing the interlocutor to freely change the point of view within the scene (to 'roam around') but preventing any affect on what happens there. There are no pre-scripted characters with goals and behaviours. The pieces designed for iCinema use a combination of chroma-key live-action footage, computer-assembled imagery and individual virtual reality devices. The apparent simplicity of the model, however, presents difficulties both technological (when used with live-action footage) and narrative (can a narrative be developed from observing the same event over and over again, even from different points of view?) that cannot be resolved within 'annotated database' structure.

4.3.1.3. Summary.

The characteristics of the 'annotated database model' are:

- can be entirely based on live-action footage;
- authorship is expressed through the selection of items and annotation;
- potential narratives are pre-defined by data in the database and the relationship between the items;
- narrative and discourse are created through interaction - before the interaction, narratives exist only as possibilities within the material and the annotation;
- the database units are treated as static entities – once described, their properties do not change, regardless of the context;
- the number of possible stories is finite and limited by annotation;
- can represent reality.

⁴⁸ The environment is documented in McGinity, M., Shaw, J., Kuchelmeister, V., Hardjono, A. and Del Favero, D., 2004. *AVIE: A Versatile Multi-User Stereo 360° Interactive VR Theatre*. iCinema Centre for Interactive Cinema Research, Sydney: The University of New South Wales Press. Available from: <http://www.icinema.unsw.edu.au> [Accessed January 12, 2011].

4.3.2 The 'paths models'.

4.3.2.1. Description.

The 'paths models' are a variation on the database/ montage model but without an intelligent story compiler connected with the database. The elements don't need to be annotated and allocated attributes but are connected to other elements, creating a complex web of interconnections that can be expressed graphically. Unlike a pure annotated database, the connections are fixed and cannot change.

4.3.2.2. Types

The following descriptions of the 'paths models' - 'The Complete graph model', 'The Network' ('Hypertext' model), 'The Tree', 'The Vector with side branches', 'The Maze', 'The Directed Network, or Flow Chart', 'The Hidden Story', 'The Braided Plot', 'Action Space', 'Epic Wandering', and 'Story-World' - are based on Ryan's classification of possible structures of interactive texts (Ryan, 2001). All her models consist of nodes (or lexia) - separate independent unbreakable units of (visual, audio etc) information, interconnected by uni- or bi-directional paths of various configurations. Ryan assumes that the reader/ user consciously controls the exploration of the text by choosing which path to follow from what is available at every point of change. However, such exploration, as Manovich rightly argues, does not automatically create a narrative:

To qualify as a narrative, a cultural object has to satisfy a number of criteria [...] Obviously, not all cultural objects are narratives. However, in the world of new media, the word "narrative" is often used as all-inclusive term, to cover up the fact that we have not yet developed a language to describe these new strange objects. It is usually paired with another over-used word — interactive. Thus, a number of database records, linked together so that more than one trajectory is possible, are assumed to constitute an "interactive narrative". But merely to create these trajectories is, of course, not sufficient: the author also has to control the semantics of the elements and the logic of their connection, so that the resulting object will meet the criteria of narrative as outlined above. Another erroneous assumption frequently made is that by creating her own path (i.e., choosing the records from a database in a particular order) the user constructs her own unique

'Chronovist' conceptualization method: exploring new approaches to structuring narrative in interactive narrative. However, if the user simply accesses different elements, one after another, usually in a random order, there is no reason to assume that these elements will form a narrative at all.

(Manovich, 2001, p. 201).

It is therefore the task of the author to ensure that any of the piece's (however many) exploration paths results in a satisfying narrative experience for the interlocutor.

'The Complete graph model'

In this model every nod is linked to all other nods by bidirectional paths. There are no preferences between paths.

'The Network' ('Hypertext' model)

This is a variation of 'complete graph' with some paths removed and it has been described earlier. The number of bidirectional connections to and from each nod varies, so that the user is neither totally free nor limited to a single course.

'The Tree'

This is a classic branching structure starting from a single source and developing into a multitude of branches isolated from each other.

'The Vector with side branches'

This model is based on a linear progression of the main path, enhanced with 'dead-end type' side branches.

'The Maze.'

A variation on the network model with designated 'start' and 'finish' nods.

'The Directed Network, or Flow Chart.'

The directed network is a combination of the network model and the vector model. There are designated start and finish points and core nods that each interlocutor passes through. Side branches are not dead-end, but reconnect with the main vector.

I used this model in my interactive piece 'Monica' (2005) depicting a character (Monica) from 1930s in Berlin. Monica reacted on the appearance of the interlocutor, offered tea, started playing a phonograph and asked the interlocutor to sing along with

'Chronovist' conceptualization method: exploring new approaches to structuring narrative in interactive her to her favourite song. If the interlocutor refused, she became very upset and broke one record after another. If the interlocutor sang, Monica was happy and willing to tell the story of her long-lost lover. 'Monica' was started during SAGAS workshop in Munich and used live-action footage and Macromedia Director as an encoding tool. It used a sound-recognising plug-in which reacted to volume. The clips were organised in a flow chart, which then was interpreted using the properties of Macromedia Director.

'The Hidden Story'

Ryan presents this model as a separate category. However in reality it is a representation of the interlocutor's exploration of previous models, namely the complete graph, the network or the maze models, in a situation where the available choices are not initially revealed to the user but are discovered in the course of exploration. This model presumes a two-part structure. One part of it is a graph, a network or a maze of possible choices, hidden from the interlocutor. The second part is a linear progression of the actualisation of these choices.

'The Braided Plot'

This model takes into consideration the 'spatial' dimension of the possible narrative, intervening and cross-connecting multiple exploration strands in the common progression from start to finish. It is similar to a contrapuntal structure in music. This model can be used to change the perspective on the story.

It is referred by Chris Hales as parallel-stream model (Hales, 2006, p.52) and is described by Alison McMahan as 'several linear plots loosely knitted together; each separate strand still follows the classic rules of casual transformation. The transformation from a linear method to an interactive one does not necessarily entail a transformation in narrative form' (McMahan, 1999, p.148, cited from Hales, 2006, p.52).

The artist Grahame Weinbren, who uses this model in his early pieces 'Sonata' and 'Erl King', refers to Maya Deren's distinction between a horizontal and a vertical montage 'which she calls "horizontal and vertical investigations of a situation," a division that corresponds roughly to that between narrative and lyric forms of poetic structure.'

'Chronovist' conceptualization method: exploring new approaches to structuring narrative in interactive (Weinbren, 2004) He suggests that interactive cinema allows for the exploration of both dimensions simultaneously, as it is seen in the 'braided plot' model.

'Action Space', 'Epic Wandering', and 'Story-World'

Ryan separates 'action space' and 'epic wandering' models. In these models the user is presented with an action space allowing for (more or less) its free exploration. I argue that it is a 'story-world (sandbox) model', not a 'paths model:' this has already been discussed in section 2.1.

4.3.3. 'Unconscious paths' and 'input interpreter'.

It should be noted that any of these 'paths models' (except for the 'hidden story' variation) can be either revealed or hidden from the interlocutor (even though Ryan does not discuss this possibility in her text).

The 'unconscious paths' and 'input interpreter' idea describes the situation when these structures are employed in interactive pieces where the interlocutor is not made aware of possible choices. Instead, his/her input – conscious or unconscious - is interpreted in order to allow for a preferential choice of one or other paths.

While in the annotated database model the intelligent story agent analyses the contextual relationship between the nodes, and therefore can be called an 'internal intelligent story complier', here a similar device can be employed to analyse the interlocutor's input, thus becoming an 'external intelligent story complier'.

4.3.4. A database/paths combination model

Yet another, more complex, variation is a combination of the annotated database model with the paths model, where a story agent simultaneously interprets the input from the interlocutor and analyses the contextual relationship between the nodes in order to choose the preferential path of the exploration.

4.3.5. Summary

- The model discussed in this section offers various formal ways of organising units of visual and audio material into sequences that can provide the interlocutor with more or less satisfying narrative experiences and perform a representational function.
- This model allows the usage of live-action footage, or any other visual material.

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- Authorship is expressed through the arrangement of units and the links between them, and can be refined further in a combination model, through the inclusion of an 'external story complier', or a model combining an annotated database with a paths model.
- As in the annotated database model, discourse is created through interaction, but the narratives are pre-defined and limited (there is a limited number of possible walks-through available).
- The interlocutor has a limited agency (units and links cannot be altered).
- Arranged on spatially distributed paths, units enter into permanent contextual relationship with other units with which they are connected.

4.5. Comparison of the three models.

The limitation of the 'montage model' lies in its formality and its detachment from the content – or the 'theme of the artistic utterance' as defined by Bakhtin. To take an analogy from language, this model describes different formal ways of arranging words into sentences and sentences into paragraphs. It can suggest rhyming and impose a restriction on the number of words used. It cannot show how to approach the task of writing a story – how to subordinate all these formal devices to the purpose of the 'theme' of the utterance.

The 'story world (sandbox) model', discussed earlier, can be subordinated to the 'theme' or concept because of the nature of procedural authorship but, being a simulation, cannot, as has been argued, perform a representational function.

The third type, the 'creation model', which can perform a representational function and be subordinated to the concept, is incapable of producing narratives with characters.

While the three models can be combined in an attempt to overcome their limitations, this overview argues the need for a new conceptual approach to narrative construction in interactive audio/visual media - an approach that combines the formality of structure with subordination to the 'theme' of the artistic utterance to be expressed in the work. The approach based on chronotope structure can provide exactly that, as will be argued in Chapter 5.

Figure 4-1. Comparison of three interactive storytelling models.

	'STORY-WORLD MODEL'	'CREATION MODEL'	'MONTAGE MODEL'
STRUCTURAL ELEMENTS	goal-defined characters, objects, spaces	none as such	units of visual and audio material
HOW IS AUTHORSHIP ACTUALISED?	pre-defined variables (elements of the story-world) and algorithms (arrangement of these elements), created according to author-defined storytelling paradigms	algorithms linking the interpretation of the user's input and live generation of procedural computer imagery; algorithms can be based on simple real-life narratives	annotation database; interconnecting links structure;
HOW IS NARRATIVE ACTUALISED?	the story-world exists prior to interaction; narrative is actualized through interaction between the user and the story-world	the story-world and its fabric do not exist prior to interaction; the story-world and the narrative are created/ actualized through the interaction; the resulting 'narratives' are 'live-generated' and non-reiterative in nature;	through interaction; but the narratives are pre-defined by the annotation and the links structure and are limited;
IMAGE ORIGIN	Precomputed rendered live animation	possible to use live-action footage as a source for computer-generated images; visuals are created as live-rendered computer animation	live-action footage or any other origin
LIMITATIONS	1/cannot use live-action footage 2/ AI story engine/ agents - have limitations 3/ algorithm-based story narratives are devoid of historicity 4/hand-authoring is labour-consuming; 5/despite an infinite number of combinations, the elements are reiterative in nature;	1/ limited use of live-action footage; 2/produces simple non-verbal narratives; cannot produce complex narratives with characters;	1/formal structures detached from content 2/limited interlocutor's agency 3/ can be labour-consuming to provide a satisfying number of variants.
CAN REPRESENT REALITY?	produced narratives do not represent, but simulate reality.	produced narratives can represent reality.	produced narratives can represent reality.

5. Chapter 5. Conceptualising and authoring using the 'fused chronotope' approach. Time and Space.

5.1 Task.

This and subsequent chapters will investigate the implications of the chronotope conceptualisation approach for interactive audio-visual authorship and demonstrate how this approach can be used and what new narrative paradigms (models) it can produce. The aim is to outline guidelines and methods, according to which an interactive piece can be developed.⁴⁹

The practical task of an author embarking on an interactive audio/visual piece can be approached as three interconnecting sets of questions to resolve. The first set of questions concerns the overall design/structure. The second set of questions decides how the design can be implemented. The third set of questions is how it will be actualised (enacted).

Several texts on interactive authorship mention the same three levels but name them differently. Tellingly, a hierarchy emerges that reveals the researchers' views on authorship. For example, Eladhari calls these levels 'code level' (the level of implementation, programming and engines, in her opinion, the deepest); 'story level' (the level of narrative design, in her opinion secondary to the 'code level') and 'discourse level' (the only visible level, the result of interactive exploration). (Eladhari, 2002, p.45). Koenitz in his paper 'Towards a Theoretical Framework for Interactive Digital Narrative' (Koenitz, 2010) calls it 'system'/'process'/'product' and traces the origins to Roy Ascott's theory of cybernetic art. He writes:

Ascott understands cybernetic art to represent a change in the artistic focus from product to process and from structure to systems.

(Koenitz, 2010, p.179)

Unlike the above frameworks this research suggests that in interactive art with any narrative ambition the deepest, the primary level should be one of a narrative design

⁴⁹ The starting point for this investigation is the assumption that for the author the ultimate purpose of the creative act is to ensure the intended emotional and intellectual impact of the piece and the success of the cultural communication between author and interlocutor.

'Chronovist' conceptualization method: exploring new approaches to structuring narrative in interactive and concept, the level of artistic authorship - in our case, the level of a chronotopic structure.

The second level, which is determined by the first one, is concerned with how this chronotopic structure can be implemented in an audio/visual interactive form.

The third level deals with how this implemented chronotopic structure can be revealed to the interlocutor during the interaction. It concerns the communication between the author and the interlocutor (taking place when the viewer explores and experiences the piece), and covers the following three facets: the first-hand experience of the chronotope; the role of the interlocutor as protagonist of the interactive narrative; and plot-generating properties of the chronotope.

The framework that I propose aims to provide the author with concise guidance on how to approach these three sets of questions, the three levels of interactive immersive audio-visual design.

5.2. Tools.

To make the method entirely transparent and independent from any pre-designed consequential relationship, in this and in subsequent chapters I use simple fillable tables and simple sketched diagrams. However, according to the preferences of the author, this conceptualisation can also be done by employing an adapted symbolic annotation/encoding tool like Scheharazade 0.33⁵⁰ or Inform 7. The advantage of tools like Scheharazade is that creative descriptive properties are written in natural language and are simultaneously given procedural attributes and transcoded for the computer so that they can be subsequently used by another software to trigger visual and audio events. The disadvantage is a learning curve and an unavoidable degree of pre-determination as any software comes with its own 'philosophy' - set of relationships and modifiers, which are built into the software design. Inform 7 (a natural language programming software developed for writing interactive fiction texts)⁵¹ provides an even more limited range of properties and modifiers than Scheharazade and has a significant learning curve. However, the advantage of Inform 7 is that it can be used as an interactive scriptwriting tool, as texts written in Inform 7 can be executed as

⁵⁰ <http://www.cs.columbia.edu/~delson/software.shtml> [Accessed 15 August 2014]

⁵¹ <http://inform7.com> [Accessed 15 August 2014]

‘Chronovist’ conceptualization method: exploring new approaches to structuring narrative in interactive playable interactive fiction texts, providing a fast evaluation tool and feedback. Alternatively, a database tool can also be developed based on the proposed tables.

5.3 Initial planning.

The table on Figure 5-1 describes planning steps for an interactive immersive piece and outlines the workflow.

Figure 5-1. Planning steps.

TASK CLARIFICATION	OBJECTIVES	STRATEGY FOR INTERACTIVE IMMERSIVE CINEMA CREATION (PLANNING)	STRATEGY FOR INTERACTIVE IMMERSIVE CINEMA CREATION (PRODUCTION)
Initial question	Planning and design objectives	Proposed strategy for planning stage	Proposed strategy for production stage (content generation)
How can the chronotope structure be implemented and revealed in an audio/visual interactive piece? (the overall design)	<p>1/to create and support first-hand experience of the chronotope;</p> <p>2/to employ plot-generating properties of the chronotope;</p> <p>3/to position the interlocutor as the protagonist;</p> <p>4/to structure the ‘utterances’ exchange between the interlocutor and the author.</p>	<p>1/ to describe the intended narrative/ concept of the piece;</p> <p>2/ to determine in what overlying chronotope and what situational chronotopes (motifs) this narrative can take place;</p> <p>3/ to establish the structural characteristics of each of the chronotopes: -3-1 how space and time are structured and altered; -3-2 which events, objects and characters are inherent to this chronotope;</p> <p>4/ to determine the clusters of stories/ plots that can happen in the defined chronotopes;</p> <p>5/ to define the role of the interlocutor in these plots: where the interlocutor can be a protagonist; where the interlocutor can be an observer;</p> <p>6/ to determine the extent of explicitness in the response of the author to interlocutor’s reactions;</p>	<p>7/ to decide what can be pre-computed; what can be live action; what can be generative; what can be arranged as a database;</p> <p>8/ to decide and describe rules/ algorithms required for the elements;</p> <p>9/ to determine the distribution mode;</p> <p>10/ to choose the production tools to be used;</p> <p>11/ to produce the piece by shooting and designing video and audio data, assembling it, creating a database and writing algorithms if required.</p>

5. 4. Chronotopes – how the structure can be implemented in the media.

Once the concept of the piece has been defined, and the underlying chronotope and the situational chronotopes have been identified by the author (these steps are the part of the ‘creative act’ which often cannot be analysed or structured), the first and most important task of the author is to identify the structural properties of these chronotopes (3/ in the ‘planning strategy’ column).

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To accomplish this task I will first recall Lorino's and Zoran's writings developing Bakhtin's ideas on the peculiarities of the spatio/temporal relationship in chronotopes. Lorino describes the chronotopic structure as 'temporal order inscribed in a map and a map evolving in a temporal process' (Lorino, 2010, p. 8). Zoran considers space in the chronotope to be experienced through movement and to rest within a structured network of directions, axes and powers:

Chronotopic structure of space does not mean an occasional movement on a neutral scene, but rather a conception of the entire space in terms of a field of powers.

(Zoran, 1984, pp.318-319)

This structure – a spatio-temporal map with the network of axes and powers - is expressed through those aspects of the media in which the chronotope is implemented. As defined earlier, interactive immersive cinema uses pre-recorded live-action and/or documentary visual and audio data, as well as live computer-generated visual and audio data. This data is projected in an exhibition space and changes corresponding to the interlocutor's input (actions). In this exhibition, space the author provides an interlocutor with first-hand immersive experience of the chronotope of the piece. I will analyse how the chronotope can be expressed by these means, starting with the temporal characteristics and proceeding to spatial ones. Since the visual and audio material used in interactive immersive cinema is essentially of the same nature as the material used in conventional film, I will, in each case, first review how time and space are represented in conventional cinema, before moving on to discussing interactive immersive cinema proper.

5.4. Time.

Time as a narrative category in conventional film has been extensively discussed in existing literature on the subject and has direct relevance for this research, especially the concept of time as discussed in cognitivist studies of cinema (Sesonske 1980, Bordwell 1985, Branigan 1992, Grodal 1997) and the more general classification of narrative time developed by Genette for literary texts (Genette, 1980).

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Research on time in computer games has been mostly based on contemporary narrative theory that was developed for literature. The most comprehensive descriptive framework is presented by Wei, Bizzocchi and Calvert in their article 'Time and Space in Digital Game Storytelling' (Wei et al., 2010). They adapt existing narrative theory to the analysis of computer games as narrative texts and suggest that narrative time in a game is a relation between 'operational time' (the time of the actions of the player) and 'story-time' (Wei et al., 2010, p.3). To describe narrative time they use existing narrative categories of 'order' and 'frequency', and suggest the category of 'speed' (instead of 'duration'), which they understand as 'the relation between the duration of the operation of an event and the duration of the happening of that event in the story' (Wei et al., 2010, p.5). They also use the concept of 'fuzzy temporality' (polychromy) developed by Herman, which describes the situation where narrative events are not assigned to an exact position on a time-line but where their relationship can be described by three values: Earlier, Later and Indeterminate (Wei and al., 2010, p.6). They argue that 'fuzzy temporality' is the key feature of time in games allowing for interactivity and plot variations.

However, their detailed descriptive framework stops short from analysing how the discussed categories of time can express narrative content and how they affect the perception of time by the player. Even though they mention Bakhtin, their suggested framework ignores the unified spatio-temporal structure of the chronotope and its plot-producing properties, as well as the specifics of audio-visual representation and immersion discussed bellow.

5.4.1. Screen-time and action-time.

The analysis of narrative time by Sesonske takes into consideration the specifics of cinema as moving image.

Sesonske distinguishes the screen-space ('two-dimensional rectangular on the surface of the screen' (Sesonske 1980, p. 420) filled with 'pattern of light and shadow' (Sesonske 1980, p.425) and the action space ('the three-dimensional space within which the characters live and die' (Sesonske 1980, p. 420) and respectively talks about two types of time experienced in cinema: 'screen-time' and 'action-time':

Screen-time is natural time, the time of our ordinary world as measured on the screen. But action-time is created; its form is not dictated by nature, but chosen by the film-maker. Action-time events are, of course, a function of screen-time images. This duality underlines the possibility that the form of action-time in a film may differ drastically from that of natural, or as some say, 'real' time. Because the film-maker has complete control over the succession of images on screen-time, he can also control the flow of action time and make it slow, accelerate, stop altogether or even run backwards.

(Sesonske, 1980, p. 421)

In cinema, as Sesonske argues, despite the present tense of the screen-time, action-time is not limited to the present tense and can represent events in any location in time:

Location in time, in film as in literature, is internal to the work. An event we see in a film may be seen as past, present or future within the world of the work.

(Sesonske 1980, p.425)

When discussing time and tense in film, Sesonske makes an insightful observation about immediacy in film narrative. He distinguishes between the visual immediacy, which, he argues, is only apparent:

The actual immediacy of the screen-space images becomes an illusory apparent immediacy of action-space events, made more powerful by our own apparent location within the action-space.

(Sesonske, 1980, p.425)

'Chronovist' conceptualization method: exploring new approaches to structuring narrative in interactive and the immediacy of sound, which we hear 'directly and with a greater immediacy than the visual elements' (Sesonske, 1980, 425) because the reproduced sound is not a representation, but a duplicate.

However, immediacy in interactive immersive cinema is a more complex phenomenon. While the projection of visual images in the installation space remains the mediating medium, it is immersion that makes the visual immediacy not illusory but real. The action-space becomes a fusion between a mental construct created by the viewer (based on the visual cues supplied by the projections) and the real physical space of the installation where the viewer is located. Action-time (the temporal aspect of the chronotope) and screen-time (the natural time of the interlocutor) are also fused, and, unlike in conventional cinema, the immediacy created by the immersion is such that an interactive immersive work operates only in the present tense.

It leaves the author of an interactive immersive cinema piece with a dual task. On the one hand, the author is required to incarnate in the chosen medium the temporal structure of the chronotope and to impregnate it with possible events. On the other hand this temporal structure, the action-time, will have to fuse with the natural time of the interlocutor and take into consideration how this natural time is perceived and interpreted.

5.4.2. Perception of time in narrative cinema.

Before I proceed further, I will look into how action-time functions in narrative cinema and how the viewer establishes temporal relations.

Recent cognitivist studies in cinema have described how temporal structures in film are perceived and interpreted.

Branigan writes about temporal relationship in film/ story as a mental cognitive construct of parts or fragments '*taken two at a time*' (Branigan, 1992, p.40), providing a figure showing a

graphic display of several varieties of story time created as a spectator relocates the on-screen time of spatial fragment B relative to the on-screen time of spatial fragment A, resulting in a new and imaginary temporal order in the story,

'Chronovist' conceptualization method: exploring new approaches to structuring narrative in interactive relationship ABn. Some of the new relationships that may be created include temporal continuity, ellipsis, overlap, simultaneity, reversal, and distortion.
(Branigan, 1992, p.41)

He also suggests that the same principles can be applied to the analysis of how special relationships are constructed by the viewer:

The general principles illustrated here for time may also be applied to describe the ordering of space into such patterns as chains, gaps, reversals, and distortions.
(Branigan, 1992, p.41)

He stresses the difference between story-time and screen-time, and describes the process of cognitive understanding and interpretation as follows:

The impetus for creating a *story* time does not derive in any simple way from the running time of the film, but rather from top-down process seeking a new order, which will be sensitive to other constraints of data, e.g. presumed causality and event duration.
(Branigan, 1992, p.45)

Bordwell approaches the problem from a slightly different angle. While he, like Branigan, insists that 'temporal relations in the fabula are derived by inference – the viewer fits his schemata to the cues proffered by the narration' (Bordwell, 1985, p.77), he defines the temporal structure in cinematic narrative through three aspects of time: 1/the order of events, 2/their frequency and 3/their duration.

Bordwell describes the temporal structure of fabula (or story) – what was earlier called 'action-time' and what is in this research is considered as the temporal part of the chronotope - as mentally recreated by the viewer based on information supplied by the medium (visual and audio cues). It is important to note that in his study Bordwell, like other cognitivist theorists, concentrates entirely on the perceiver of the film, discarding the author and the narrator as irrelevant and arguing that the narration is 'a set of cues for the construction of a story. These presuppose a receiver, but not a sender, of a message' (Bordwell, 1985, p.62).

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He suggests that in the 'narrational process' the interlocutor should construct a narrator, or an author, according to 'specific organizational principles, historical factors and viewers' mental sets:

Contrary to what the communication model implies, this sort of narrator does not create the narration; the narration, appealing to historical norms of viewing, creates the narrator.

(Bordwell, 1985, p.62)

He therefore considers communication to be highly subjective and argues that the message is entirely constructed in the recipient's head. This differs from the position taken in this research, which concentrates on authorship attributed to the author. However, Bordwell's detailed study of how the action-time is perceived in narrative cinema, supplemented by what Branigan wrote about the cognitive process of temporal reordering, and Grodal's analysis of temporal perceptions in film, is a useful starting point for the argument being developed here.

Grodal (Grodal, 1997) approaches perceived time as a complex combination of a universal idea about time-clock and various emotional and cognitive constructs created in the process of watching a movie. He writes that time in film is

not just one but several related phenomena, of which one phenomenon is clock time, whereas the different types of experience of time constitute other phenomena... The aesthetic experience of time in visual fiction is not directly linked to the clock-time speed of projection, but to time as *constructed during perception and cognition*.

(Grodal, 1997, p.139)

The same interval of objectively measured clock-time can be perceived as a longer or a shorter one depending on the context and the state of the observer. Grodal suggests that the perception and reconstruction of time in film is a process where the schemata of 'objective time structure' is contrasted with different subjective modes of perceiving time (Grodal, 1997, p.141):

1/ evaluation of causal chains and the construction of fabula;

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- 2/ perception and schematization of narrative events and the evaluation of their 'speed';
- 3/ valenced (i.e. positively or negatively coloured) expectations of the outcome of these narrative events;
- 4/ felt salience of the events;
- 5/ the specifics of the narrative and its modality;
- 6/ the frequency of events; and
- 7/ the space where these events are perceived taking place.

When talking about perception of time in editing, Grodal compares 'act-schema' time compression (editing which shows the intention of the action and its achieved goal) with perceptual time compression (editing showing the duration of the entire action, but in fast-motion' to fit the available screen time) and suggests that 'act-schema' editing allows to preserve the perceived integrity of time, while perceptual time compression feels 'like a tampering with space-time' (Grodal, 1997, p. 143). This is particularly valuable for the present study as an important task when implementing a chronotope is to preserve and reinforce the immersion and immediacy, or, as Grodal calls it, 'reality-status' – the sense of the events taking place in the same physical space as that in which the interlocutor finds him/herself.

The above studies of temporal perceptions in cinema show that there are various ways in which the viewer's perception of time can be changed and shaped, and that the 'time felt' is not congruent to the objective duration of 'clock-time'. It becomes even more so in interactive immersive cinema, where the personal time of the interlocutor is fused with the perceived time of the piece, experienced in the present tense.

5.4.3 Time in interactive immersive cinema.

The previous pages provide a grounding for understanding the peculiarities of temporal perception, both in conventional and interactive immersive cinema. I will now proceed to analyse which elements and modes of cinematic temporal perception, from those listed above, can be controlled by the author, and how the author can approach the task of designing the temporal aspect of chronotopes.

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I suggest that when analysing modes of the perceived time of an event, it is possible to describe any of the modes by using a combination of three variables:

1/**the direction of perceived time** of the event (X),

2/**the speed of time in the event** (Y) and

3/**the duration of the event** (ED) characterised by X and Y.

These three variables can describe both individual events/shots and a segment of the interaction consisting of several shots. When events are combined in a segment (either as the segment congruent to the total duration of the interaction, or a segment defined as such by the author) three more characteristics can be used:

4/ **the frequency** of events in a segment (F);

5/ **the number of simultaneous events** at any given moment of a segment (N);

6/ **the clock-time duration** of a segment (D).

While the first three characteristics relate to individual shots, the latter three deal with the spatial and temporal arrangements of shots (segments) within the piece. They can be consistent throughout the duration and the space of the piece, or they can change, both temporally - as the time of interaction progresses - and spatially, as the interlocutor moves within the installation space.

I will consider each of the variables as applied to interactive immersive cinema. The combination of these variables as distributed in space constructs the temporal characteristics of the chronotope.

Direction of time and order.

In interactive immersive cinema the direction of perceived time is expressed as an order of the sequences of projections of visual and audio material. It can be: 1/ direct; 2/reverse; 3/stand-still.

It is important to note that the reverse order of time can only be perceived as such in reference to the same sequence/event in direct order which has already been perceived or is known to the interlocutor, and, therefore, is dependant (secondary) (subordinate).

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There are two levels on which the order of visual and audio material in interactive immersive cinema can be considered:

1/The first, lower, level of order applies to the events within pre-recorded video or audio shots, which are entirely determined by the author during the shooting and montage, and which cannot be changed by the interlocutor. In each contained finite shot, this order is expressed through a singular linear irreversible progression; it can be intentionally projected in direct or in reverse: the direction of time is pre-determined by the author as required for the chronotope implementation; it is revealed as a response to the interlocutor's actions.

2/The second, higher, level of order is the combination ('live montage') of visual and audio material (shots and sounds) as this material is being presented to the interlocutor as the result of the interaction. This order of narrative events in interactive immersive cinema can be: a/ reversible - when, as a result of the interaction, a sequence of events is replayed in reverse order; b/ space-distributed ('3d') - since the projections of visual and audio material are not limited to a two-dimensional screen, but can be arranged as needed using the entire volume of installation space; this was already discussed when I was talking about the spatial aspect of the chronotope; and c/ non-linear (in multiple-projection installations) when multiple projections are used, and individual elements can be assembled not just sequentially but also simultaneously and in parallel to each other. Projections can also remain at a constant size or dynamically change in size relative to each other in order to prioritise certain streams of events. All the above is determined both by the author and by the actions of the interlocutor. This is very different from the irreversible linear progression of edited shots in film. This changing interactive 'improvised' nature of temporal order in interactive immersive cinema and the dependence of this order on the actions of the interlocutor can significantly enhance immersion and immediacy in the interlocutor's experience of the chronotope of the piece.

Spatial mapping of the temporal order of the piece, being one of the characteristics of the chronotope, is created by the author and revealed by the interlocutor. The author needs to be aware of existing perceptual schemata and the necessity for the

'Chronovist' conceptualization method: exploring new approaches to structuring narrative in interactive interlocutor to be able to interpret visual and audio cues according to causal connections. Branigan lists four principles of causal reasoning:

that a cause must precede an effect, an effect cannot work backward in time to create a cause, certain patterns of *repetition* among events make a causal connection more likely, [...] and a prior event which is temporally or spatially more proximate to the outcome than others is more likely to be a cause of the outcome.

(Branigan, 1992, p.40)

These cognitive principles are general and are often used subconsciously by skilled narrators. In interactive immersive cinema, they provide the basis for narrative and temporal interpretations of presented visual and audio cues. While the interlocutor might apply them without being aware of them, the author can consciously use them to his/her advantage.

Freeze-frame, dissolves, jump-cuts.

A special case of temporal order is represented in what has been called here a 'stand-still'. Grodal writes about the atemporal or 'timeless' quality of a freeze-frame:

Time-space is transformed into a purely timeless space when moving pictures are frozen into a still. This atemporality indicates that the experience has lost its unambiguous localization in the exterior space, or its distal qualities, and is now experienced as 'interior' as well, that is a mental image.

(Grodal 1997, p.150)

Grodal calls this temporal form 'durative'. While it is true for the first, 'lower', kind of temporal order, the nature of interactive immersive cinema negates the effects of freeze-frame for the order of the second kind. Since the real time-space of the location of the interlocutor is fused with the virtual time-space created by the projections, a freeze-frame can never lose completely its temporality and its localization in relation to the interlocutor.

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However, Grodal is right when he stresses that freeze-frame, as well as some other modes of editing - for example, dissolves and repetitions - can change the perceptual experience, rendering it durative:

Some types of representations activate forms of experience which indicate a certain 'reality hypothesis': this chain of events can be experienced as taking place in a possible existing, physical world (this is frequently the case in the telic, canonical narrative). Other types of representation [such as freeze-frame] might cue a reception in which the events and phenomena of the exterior world are experienced as symbolic representations of mental events.

(Grodal, 1997, p. 151)

A similar effect can also be caused by jump-cuts and other time distortions (flash-backs, flash-forwards), common in literary texts and film. In interactive immersive cinema, these modes of editing promote detachment from the piece, change the perceptual 'reality-status' and decrease or annihilate immersion. Therefore, these modes of montage should be restricted or used with great caution.

Perceived speed of events.

The speed of events is a relative category determined by the duration of the events in relation to the cognitive schemata of the interlocutor and the general idea of clock-time that the interlocutor possesses.

Duration of events and their clock-time duration.

As with the category of order, the category of duration in interactive immersive cinema can be considered on several levels and can be divided into two types.

One type is subjective duration, which exists only for the interlocutor:

1/ the perceived duration of individual events;

2/ the perceived duration of the actualised narrative/ fabula.

The second type is the objective duration of the projected material, which is set up by the author, but which can be affected by the actions of the interlocutor:

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a/ the clock-time duration of an event within an individual shot (for example, 'a car appeared from around the corner, passed by the camera and disappeared off screen'). The clock-time duration of an event within the individual shot is set up by the author, but is affected by the interlocutor, whose actions determine the duration of the projection of each shot and can therefore shorten the clock-time duration of the event if the shot is interrupted or stopped before its ending.

b/ the clock-time duration of the projected individual visual and audio instants, which can have one or more events within them ('1/the car passed; 2/then, a black cat ran across the road'). The duration of each individual shot is established by the author but, again, is affected by the actions of the interlocutor who can interrupt the shot before its ending as shown above.

c/ the clock-time duration of the interaction between the interlocutor and the piece. The clock-time duration of the interaction – the encounter - between the author and the interlocutor is established by the author but actualised by the interlocutor. It can be:

- finite, when after a certain period of clock-time the interaction stops regardless of the actions of the interlocutor; or

- infinite – open-ended, which can only be stopped by the interlocutor.

However, finite duration of the interaction can also be prematurely shortened by the interlocutor.

When discussing the duration of the event it is important to take into consideration that clock-time duration and the perceived duration of the event exist independently of each other. As Branigan has pointed out, the perceived duration of an event might not depend on the whole of the event shown to the viewer:

Our judgement of an event as temporally continuous is *not* based on the *necessity* of its being physically complete on the screen. Perceptual illusions and constancies demonstrate that we may easily see what is not present, or fail to see what is present.

(Branigan, 1992, p.45)

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As a consequence, even when the clock-time duration of the event is shortened as the result of the interaction, the perceived duration of the 'uncut' event and the perceived duration of the shortened event might (appear to) be the same.

Frequency of events.

The category of 'frequency' was proposed by Genette who defines it as the relationship between an event in the story and its reflection in a text.

He states:

A system of relationships is established between these capacities for 'repetition' on the part of both the narrated events (of the story) and the narrative statements (of the text) – a system of relationships that we can a priori reduce to four virtual types, simply from the multiplication of the two possibilities given on both sides: the event repeated or not, the statement repeated or not.

(Genette, 1980, p. 114)

However, in this research, I use the term 'frequency' differently - to describe how often distinct events occur in a given temporal segment. In a cinematic narrative, it can be called 'rhythm', 'pace' or 'tempo'; in interactive immersive cinema this category can also describe 'responsiveness' ('the speed of the response') or the measure of delay between the action of the interlocutor and the change in the piece this action causes.

The frequency of events is determined by the author: it can be consistent throughout the duration of the piece, or it can vary. For example, it can change as the result of the interaction - the actions of the interlocutor can speed up or slow down the pace of the piece. It can also change with the passage of clock-time, as the piece progresses. Additionally, as has been already noted earlier, it can be space-distributed - different throughout the space of the installation, with certain areas characterised by a higher frequency and certain areas characterised by a lower frequency of events.

Number of simultaneous events.

If the installation uses multiple projections, at any given vantage point in time a number of simultaneous events might take place, each characterised by its own

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5.4.4. Time. Summary.

The table on Figure 5-2 summarises the above and specifies different aspects of time in interactive immersive cinema and their dependency on the two participants of the communication – the author represented by the text, and the interlocutor.

Figure 5-2. Temporal elements of chronotope design in interactive immersive cinema.

TEMPORAL ASPECT	TEXT (AUTHOR)	INTERLOCUTOR
DIRECTION OF TIME		
Order 1 (events within a single shot – within prerecorded video and audio material)	The order be direct, reverse or stand-still. It is determined by the author during production process as required for the chronotope implementation; it is revealed as response to the interlocutor’s actions.	The interlocutor cannot affect this kind of order; he/she can only reveal it.
Order 2 (combination of visual and audio material as the result of the interaction)	Can be reversible, space-distributed, non-linear; is structured by the author through procedural rules and revealed as response to the actions of the interlocutor.	The actions of the interlocutor influence the order of events, resulting in the sequence of visual and audio projections, unique to each interaction.
Narrative time direction	In a chronotopic time direction is not actualised but exists as potential; all events exists simultaneously in a tempo-spatial map with axes, vectors and powers; it is revealed as the narrative unfolds as the result of the interaction.	For the interlocutor, the direction of time of narrative revealed during the interaction is fused with individual personal time; it is experienced subjectively and in present tense; this fused personal time differs from physical clock-time of the interaction and is subjected to alterations; temporal illusions etc.
TEMPORAL ASPECT	TEXT (AUTHOR)	INTERLOCUTOR
SPEED OF EVENTS		
Clock-time speed of events	The speed of events is set up by the author.	Speed of events can be affected by the actions of the interlocutor within the limits set up by the author
Perceived speed of events	Speed of events is contextual. The author can influence cognitive schemata and the general idea of clock-time by incorporating a reference to it in the structure of the piece.	Perceived speed of events depends on cognitive schemata of the interlocutor and the general idea of clock-time the interlocutor possesses.

Figure 5-2. Temporal elements of chronotope design in interactive immersive cinema (cont.)

TEMPORAL ASPECT	TEXT (AUTHOR)	INTERLOCUTOR
DURATION		
<u>Clock-time duration</u>		
Duration of the interaction/personal time	The author can set the limit on the clock-time duration of the interaction.	The interlocutor determines the duration of the interaction and perceives it as his/her personal time.
Duration of an individual projected shot	The original duration of a single projected shot is determined by the author. The shot can be 'simple'-consisting only of one continuous take, or 'complex' – containing a sequence of shots edited together.	The duration of a single projected shot can be affected by the actions of the interlocutor – the shot can be shortened; however, it cannot be prolonged beyond its length.
Duration of event within the shot	The duration of an event in the shot is determined by the author. In a 'simple' shot (see above) the duration of an event is equal or longer than the duration of the shot (the take might start after the beginning of the event and finish before the end of it); in a 'complex' shot the event is a composite of several takes edited together; the duration of the event is equal to the duration of the shot.	The duration of the event within the shot cannot be affected by the interlocutor; however, the actions of the interlocutor can affect the duration of the shot and therefore the duration of the presentation of this event.
<u>Perceived duration</u>		
Duration of the perceived narrative	Narrative doesn't have its own duration; all elements of the narrative exist simultaneously until they are actualised and revealed in a temporal sequence by the actions of the interlocutor.	For the interlocutor, the duration of the perceived narrative is equal to the personal time of the interaction.
TEMPORAL ASPECT	TEXT (AUTHOR)	INTERLOCUTOR
TEMPO/FREQUENCY		
Frequency of events	The frequency of events is set up by the author.	The frequency of events can be influenced by the actions of the interlocutor.
Responsiveness	Responsiveness is set up by the author.	
Number of simultaneous events	The spatio-temporal continuum of a chronotope is impregnated with potential events, which are revealed, one-by-one or simultaneously as the result of the interaction. The author decides which events can run simultaneously and which can only run subsequently.	If the actions of the interlocutor reveal simultaneous events, the interlocutor can prioritise which events to follow, therefore reducing the temporal variety available to one progression.

5.5 Space.

Space, as shown by Oliva, Park and Konkle (Oliva, Park and Konkle, 2011):

is modulated by low-level image cues, top-down influences, stored knowledge, and spatial and temporal history. Like an object, a space has a function, a purpose, a typical view and a geometrical shape. The shape of a space is an entity that, like the shape of an object or a face, can be described by its contours and surface properties. Furthermore, the perception of space is sensitive to task constraints and experience and subject to visual illusions and distortions in short-term and long-term memories.

(Oliva, Park and Konkle, 2011, p.333)

Bordwell considers space to be a core narrative device in mimetic narration, from paintings and stage design to cinema (Bordwell, 1985).

Since interactive immersive cinema employs live-action footage, the properties of the cinematic space are discussed as a part of the analysis of space in interactive immersive cinema.

A descriptive analysis of interactive space was first attempted by Wei et al. (Wei et al, 2010). However, as their research is specific to computer games it treats space as a mental construct by game designer and player, supported by visual and audio representations on the computer screen. Wei et al. provide a detailed descriptive framework distinguishing 1/ 'topographical structure' - static 'spatial reference of the story world'; 2/'operational space' which is the space revealed during the game through events and actions of the player; and 3/ 'presentational space' which is the summary of visual and audio 'manifestations of the game world' (Wei and al., 2010, p.7). The 'operational space' and 'presentational space' are essentially the same and are a visible/ audible part of the static underlying topographical structure. In the authors' interpretation the topographical structure is time-independent (therefore 'static'); time plays a part in 'operational' and 'presentational' spaces as they are revealed dynamically (in time) through events and actions. The authors treat time as secondary and auxiliary to space and call it 'chronotopic', which is a misunderstanding of the fundamentally different spatio-temporal relationship suggested by Bakhtin and

'Chronovist' conceptualization method: exploring new approaches to structuring narrative in interactive from the framework suggested in this research. The problem of immersion and relationship between the (real) space of the player and the space of the computer game is also not taken into consideration.

5.5.1. Space in interactive immersive cinema.

Space in interactive immersive cinema is a fusion of two distinct entities: the space as represented in projections of video and audio material (and to analyse this I will review how space is represented in conventional film); and the physical space of the installation where the material is projected and where the interlocutor is physically located. The two entities are fused for the interlocutor due to immediacy and immersion, creating a subjectively experienced spatial aspect of the chronotope. There are two possible approaches to the space of the installation: the author might choose to treat the space of the installation as semantically absent, hidden under a new virtual space created by the projections; or as semantically present, active, incorporated within the piece ('March').

Since the interlocutor is physically present in the installation space (which, for the time of interaction, transforms into a fused chronotope of the piece), the reconstruction of the story space by the viewer is different from the experience in cinema, and the means used by the author should also be different. This part of the research will investigate these differences.

5.5.1.1 Space representation.

Interactive immersive cinema employs live-action footage similar to the footage used in conventional film. Both Bordwell (Bordwell, 1985) and Branigan (Branigan, 1992) argue that space in cinema is a mental construct created by the viewer based on the stimuli and cues provided by the author in a sequence of shots, with the aim to express a unique conceptual and perceptual idea of the world. The main structural devices used for space representation in film are:

1/**selectivity (framing);**

2/**relationship between elements** (both within a shot and between consecutive/ adjacent shots);

3/**perspective – point of view (POV).**

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These three elements can be applied to the analysis of both the space represented in pre-recorded or generated footage, and the fused space of the actual projections and the physical space of the installation.

Selectivity.

Selectivity expressed through framing. It relies on a mental reconstruction of the entire uninterrupted continuous world based on discrete separate fragments.

Figure 5-3. Cinema frame.

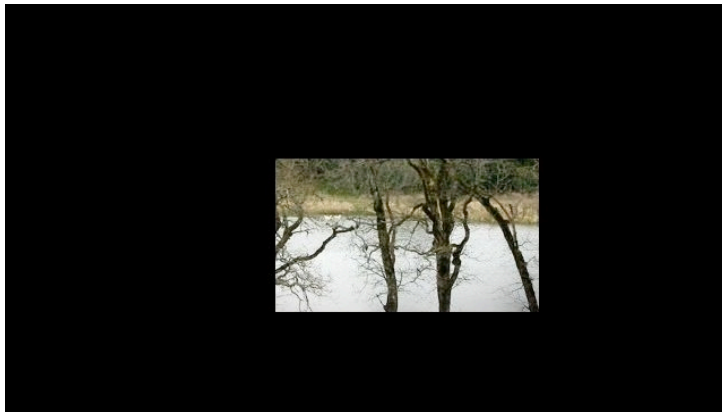
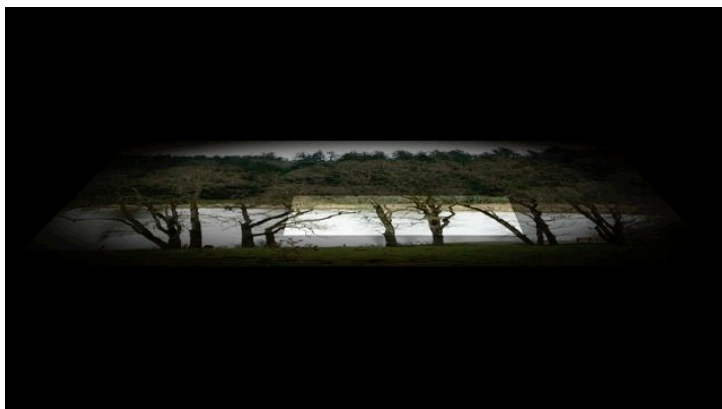


Figure 5-4. Cinema frame in relation to mentally reconstructed space.



Figure 5-5. The plane of 'mental space reconstruction' in cinema (side view).



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Figures 5-3, 5-4 and 5-5 show the relationship between the frame and the 'outside the frame', as well as the relationship between the represented space and the physical space (screen) in cinema.

Grodal writes:

Space is not imagined as 'stopping' at some point during fading. Objects are not necessarily perceived as cut by the field of vision: we may only see part of a wall or part of a tree, but the way we represent this is not primarily as 'fragment of tree', but as 'tree' (...) The frame is not a limit, but a support for focus of attention. Reframing serves to refocus and redirect attention. Space and objects will phenomenologically continue outside the frame that masks the represented, in the sense given to masking in phenomena like windows, as well as in the sense that a certain focal length of lens may mask some phenomena and focus the visual attention on others.

(Grodal, 1997, p.63)

This is not completely true, however, for interactive immersive cinema. The movements of the interlocutor within the installation space places framed projections in a different context. The (dark or lit) physical space of the installation between the projections becomes the 'outside the frame'. Objects do continue outside the frame but the space warps and hides this continuation (Figures 5-6 and 5-7).

Figure 5-6. An installation projection frame.

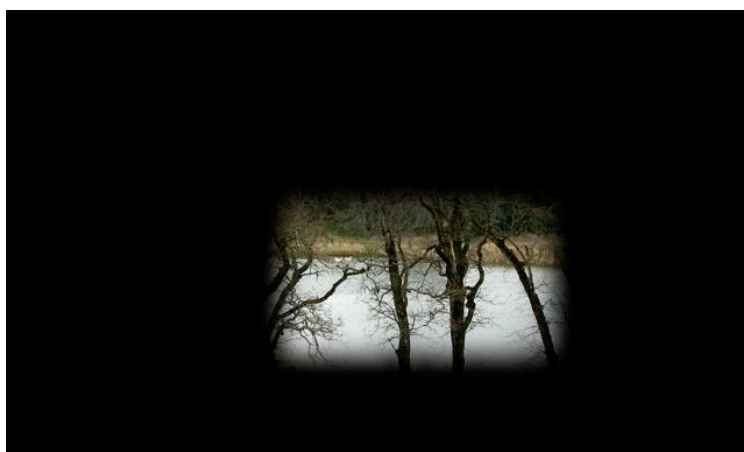


Figure 5-7. The plane of 'mental space reconstruction' in installation (side view).



A more complex situation arises when the interlocutor is presented with simultaneous multiple projections. There are two possible perception patterns. For the material, which is visually diverse and perceived as multiple diverse spaces, the function and semantic value of respective frames remains intact, and the relationship between the represented space(s) and the physical space of the installation are the same as in the example with one projection (Figures 5-8, 5-9).

Figure 5-8. Multiple projections 1.

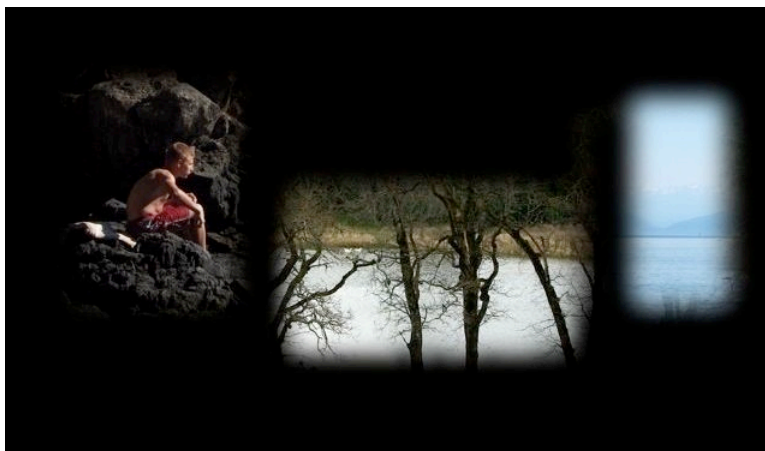
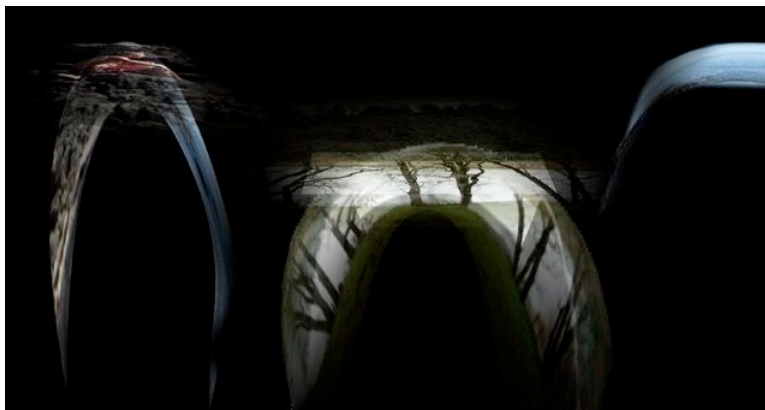


Figure 5-9. The plane of 'mental space reconstruction' in installation (side view).



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When multiple projections present visually alike (fusable) images, which can belong to the same space, the function and semantic value of their respective frames change; perceived together, they might be fused in one unifying, even if fragmented, space (Figure 5-10, Figure 5-11 and Figure 5-12).

Figure 5-10. Multiple projections 2 (alike/fusable).



Figure 5-11. 'Mental space reconstruction' for alike/fusable images.

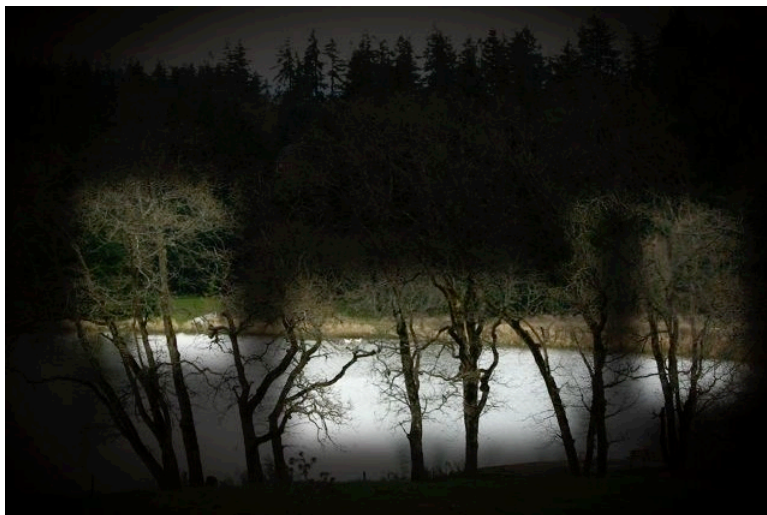
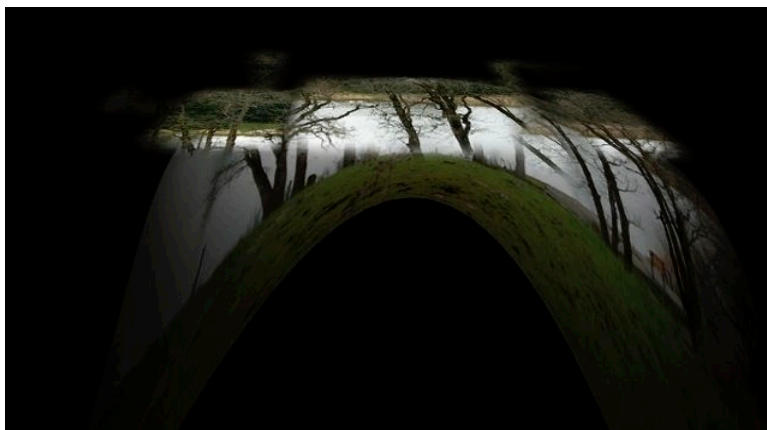


Figure 5-12. The plane of 'mental space reconstruction' for alike/fusable images.



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Grodal continues:

The film-makers can activate the 'frame', the boundedness, in many ways to produce specific effects. The typical boundedness of film and television is not spatial, however, but temporal: the boundary is not 'what is outside the spatial frame?' but 'what is beyond the temporal now?'

(Grodal, 1997, p.63)

Here, Grodal points to the spatio-temporal unity of the narrative space, as well as the priority of temporal axes for the narration. While in conventional cinema the curiosity to know what is outside the spatial and temporal remains passive and cannot influence the narrative progression, in interactive immersive cinema this very curiosity motivates the movement of the interlocutor in the installation space. The author's task is to sustain and to satisfy this curiosity simultaneously.

5.5.1.2. Relationship between elements.

As mentioned earlier, Branigan proposes to describe physical phenomena 'in terms of interaction between parts *taken two at a time*' (Branigan, 1992, p. 40) and suggests that this approach can be used not only for analysis of temporal but also spatial ordering. While his attempts to analyse space represented on screen as a combination of two parts – a foreground and a background – is not entirely convincing and relevant for this research, relativity and relationship between elements are the main tools for creating cinematic space representation.

In cinema, this relationship is established in two ways. One is the relationship between elements within an individual shot (spatial 'planes' - background/ middleground /foreground - and objects - their distribution, location, size and movement); the second is the relationship between consecutive shots (montage). In interactive immersive cinema, the relationship between elements within an individual shot can be structured and analysed in the same way as in conventional film. However, the relationship between individual shots is very different. This relationship is considered not between two shots in linear non-reversible progression, but between all shots projected simultaneously. As has been shown earlier when discussing framing, sufficiently semantically similar shots projected simultaneously can be fused in the perception of

'Chronovist' conceptualization method: exploring new approaches to structuring narrative in interactive the interlocutor into one (though fractured) space (Figure 5-10 and Figure 5-11). If the shots are semantically different, they can be perceived as representations of different sub-spaces within the over-encompassing fused space of the installation/story; these individual sub-spaces are not discrete but connected; simply, the 'distance' between them is hidden in a spatial fold (Figure 5-13 and Figure 5-14).

Figure 5-13. Simultaneously projected different shots.



Figure 5-14. Spatial fold 'hiding' parts of 'fused space'.



This new type of relationship between elements calls for a new theory of montage, a theory that would set up principles for non-linear multi-shot editing. For example, in multiple projections 'Kuleshev's effect'⁵² plays itself not in consecutive linear sequence, but in the horizontal or vertical juxtaposition of several simultaneous shots. Kuleshev's 'Creative geography' ('Tvorimaia Zemnaia Poverhnost') effect will also play in the simultaneous combination of several shots.

⁵² 'Kuleshev' effect', 'Creative geography' ('Tvorimaia Zemnaia Poverhnost') and 'Creative man' ('Tvorimy Chelovek') were demonstrated by the Russian film-maker Lev Kuleshev in 1910s-1920s and described by Vsevolod Pudovkin (Pudovkin, 1929, p.184), also by Kuleshev himself in Kuleshev, L.1987 *Iskusstvo Kino* in: *Sobranie Sochineni v Treh tomah*. Moskva, USSR: Iskusstvo.

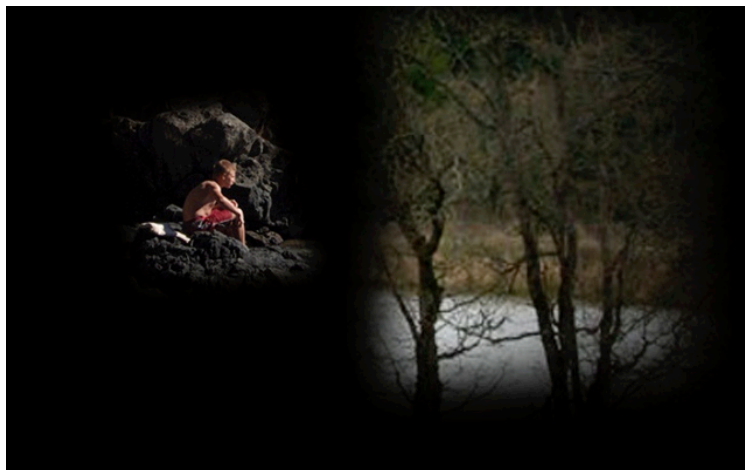
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Another new structural element, non-existent in conventional cinema, is the possibility to change freely the size of any projection, thereby establishing a new spatial relationship between them. Figure 5-15 shows multiple projections of similar size. No one is given priority, and for the interlocutor they are located at a similar 'semantic distance'. Figure 5-16 shows the same projections, but of different size. For the interlocutor, they are now located at different 'semantic distance'.

Figure 5-15. Projections of equal size.



Figure 5-16. Projections of different size.



Finally, there is a perceptual and semantic difference between the space straight in front of the interlocutor and the space at the side or at the back; therefore the same visual material is perceived and interpreted differently⁵³ according to where it is projected in relation to the interlocutor.

⁵³ More on visual perception and cognition in Wade, N. & Swanston, M., 2001. *Visual perception: An introduction*, Hove; Philadelphia: Psychology Press.

Some practical consequences. New continuity.

In order to sustain immersion and the fusion between the projections and installation space, the author needs to consider carefully the material used. In film, there are certain rules required by continuity editing (a kind of editing which aims to make edits as unnoticeable as possible). A sudden dramatic change of focal lens in adjacent shots makes a cut very apparent, as does a sudden change of distance – for example, a cut from a long shot to an extreme close-up; a sudden change of an angle and point of view produces the same effect. Therefore, to preserve the unity of the created space, there should be a connection and harmony between all shots forming the visual material of the piece; or, to use the language of film production, they should all be inter-cuttable. For live-action footage this unity needs to be contemplated during the planning stage and can be achieved by 1/ using a selected narrow range of focal lenses, 2/ keeping consistent the camera angle and lighting and colour of the shots. Any derivation from this 'seamless' unity must have a dramatic reason and can serve as a structural point of the piece.

5.5.1.3. Perspective/ POV

The category of perspective in narrative theory as applied to verbal discourse was first developed by Genette (Genette, 1980). He suggests a category he calls 'narrative mood' which depends on 'distance' (the distance between the narrator and the story expressed in the way the story is reported by the narrator) and 'perspective' /'focalization' defined as

a restriction of 'field' – actually, that is, a selection of narrative information with respect to what was traditionally called *omniscience*.

(Genette, 1980, p. 74).

Therefore, in verbal discourse both of these notions are defined as a relationship between the narrator and the story.

With cinema and in interactive immersive cinema, however, for the purpose of this research the categories of perspective and point-of-view (POV) are defined as a relationship between the viewer (the interlocutor) and the story (visual and audio material).

Implementation of perspective /POV in pre-recorded and live-generated footage.

Perspective/POV in pre-recorded live-action footage is created during the shooting and is expressed through framing and camera setup (camera angle, lenses, and camera movements).

The perspective /point of view, as Bordwell explicitly argues (Bordwell, 1985) is not an imitation of an 'ideal viewer', and the camera is not 'the eyes of a witness'. On the contrary, according to Bordwell, Branigan and Grodal, the perspective/POV is one of the cues presented in visual material on the basis of which the viewer can mentally reconstruct the space.

Approaching the same concept from the author's point of view, perspective/POV can be considered a structural device employed by the author to create a representation of the story space, or, according to the cognitivist studies, to create relevant cues on the basis of which this space can be mentally reconstructed.

In interactive immersive cinema, POV inherent to pre-recorded footage is created with the same means as in conventional cinema.

However, for the interlocutor, the POV is distorted by the spatial distribution of the projections, the (possible) movements of the projections, changes in their sizes, and the movements of the interlocutor him/herself. Similar to what happens when the viewer is presented with optical illusions, this distortion might produce illusory spaces that confuse the interlocutor's physical stimuli. A significant difference is the dynamic position of the viewer. While in an Ames' room, for example, the viewer is given one carefully chosen pinhole to look at the illusion, here the visitor is free to roam around the installation space, approach or distance herself from the projection thus altering the framing, and possibly be in the position where part of the projections can be obscured or is outside the vision field. Illusion can also be broken when the physical actions don't confirm visual stimuli.

Therefore, in interactive immersive cinema, the perspective and POV expressed in pre-recorded footage are undermined, altered and sometimes contradicted by the spatial distribution of the projections, by the multiplicity of them, by their spatial movement and by the movements of the interlocutor.

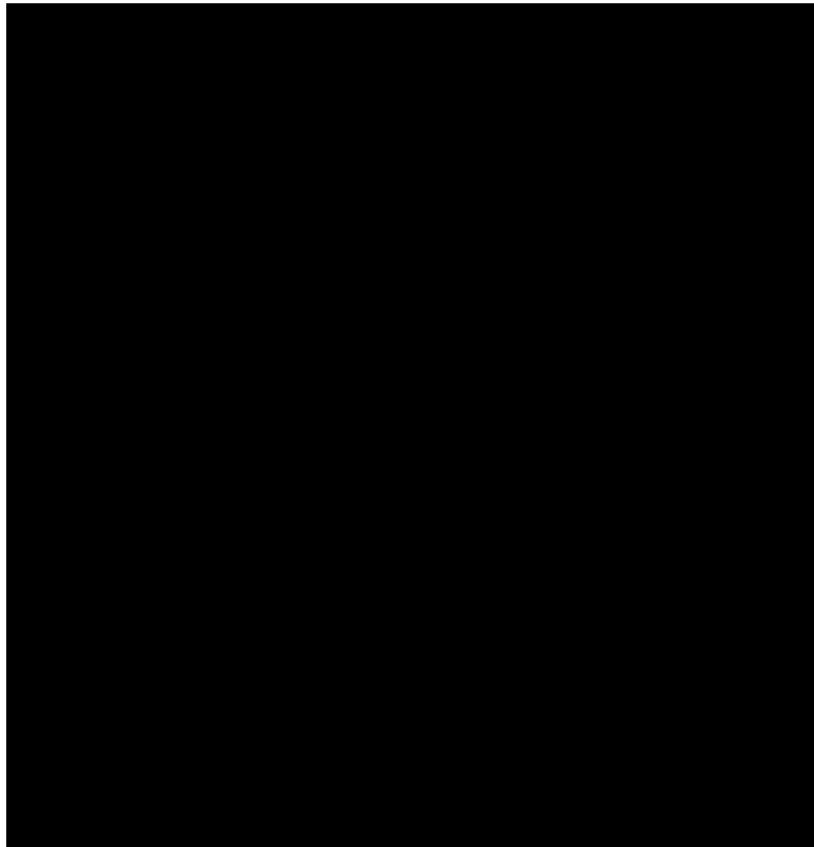
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At the same time, the spatial distribution and movement of the projections allow for the creation of a dynamically changing POV tuned to the position of the interlocutor in the installation space.

The chronotopic structure of the text in interactive immersive cinema presumes a certain consistency of perspective and POV throughout the story/installation space. It can be described by analogy to a medieval model of perspective, rather than the linear visual perspective of the Renaissance.

Figure 5-17. Kurzenkov, L. 1980. *Saint Antoine, Saint John and Saint Evstafy Vylensky, The Church of Holy Spirit, Vilensky Monastery, Vilnius, Lithuania.*

(Source: <http://www.patriarchia.ru/db/text/907694.html>)



We can imagine that the temporal component of the chronotope has disappeared or became an equal eternity, and all elements of the piece (visual and audio material) are revealed simultaneously in the exhibition space (in all possible locations, sizes and possible shots). All events possible in the chronotope take place at once, like in a Russian icon or a medieval painting (Figure 5-17).

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When the interaction starts this model is concealed, and the actions of the interlocutor allow for it to be uncovered gradually (and not necessarily completely), according to the temporal structure of the chronotope.

5.5.2 Expressing chronotope through interaction and movement in space.

The discussion about elements through which the spatial structure of chronotope can be expressed in interactive immersive cinema has direct authorship implications, showing how the spatial properties of the chronotope can be implemented in an interactive immersive cinema piece.

For example, if the chronotope is characterised by 'impossibility to reach anything', when the viewer physically moves towards the projection of the shot, the projection's dimensions, brightness and the position can change, moving away from the viewer, diminishing and fading away. When the chronotope is characterised by 'crowded space with no air', the projections can surround the viewer, coming closer and growing in size with her every movement. When the chronotope is characterised by 'stickiness of the space', the movement of the projections in response to viewer's actions can be delayed and slowed down, imitating the movement of objects through a sticky substance.

5.5.3. Space. Summary.

The table on Figure 5-18 summarises different structural elements of the space in interactive immersive cinema and their dependency on the two participants of the communication – the author represented by the text, and the interlocutor.

5.5 Conclusion.

This chapter has discussed how two main categories of chronotope – space and time – can be expressed in an interactive immersive audio-visual text. The next chapter will approach the chronotopic spatio-temporal continuum as an environment and introduce the concept of 'chronovist'.

Figure 5-18. Spatial elements of chronotope design in interactive immersive cinema.

SPATIAL ASPECT	TEXT (AUTHOR)	INTERLOCUTOR
Selectivity/framing	Framing is determined by the author during production and post-production. Framing is a structural device providing the interlocutor with visual cues so that he/she can reconstruct spaces and objects lying outside the frame. The curiosity to know what is outside the spatial and temporal boundary motivates the movement of the interlocutor in the installation space; and the author's task is to sustain and simultaneously to satisfy this curiosity.	Framing is affected (distorted and altered) by the movement and position of the interlocutor.
Relation between elements within an individual shot.	The author establishes relationship between different elements within an individual shot during production. These relationships are established through spatial 'planes' (background/middle-ground/foreground) - and objects (their distribution, location, size and movement).	The interlocutor cannot alter the relationship between different elements within an individual shot.
Relation between elements between individual shots	The author sets up (the law of) spatial and temporal relationship between individual shots in the piece through: 1/ locations of projections; 2/their size, 3/their timing (relative to other projections).	The interlocutor reveals the relationship between individual shots in the process of interaction with the piece. However, in the multiple projections installation these relationships are altered by the movements and by the perception of the interlocutor.
Perspective/ POV	Perspective and POV are structural devices used by the author to express spatial properties of the chronotope. The author does it by defining perspective/POV in pre-recorded footage, as well as structuring the perception of perspective and POV in the installation space. In pre-recorded live-action footage perspective/POV are created during the shooting and are expressed through framing and camera setup (camera angle, lenses, and camera movements). The author needs to be aware that, for the interlocutor, perspective and POV expressed in pre-recorded footage might be undermined, altered and sometimes contradicted by the spatial distribution of the projections, their multiplicity, their spatial movement, changes in their size and by the movements of the interlocutor him/herself. Therefore, the author needs to predict and structure perspective/POV formed as a result of the fusion between the installation space and the virtual space represented in the projections.	The interlocutor might alter or distort perspective/POV of the pre-recorded footage by his/her movements within the installation space. Perspective/POV contribute to immersion and immediacy of the interlocutor and help to create the subjective experience of the chronotope.

6. Chapter 6. Chronotope and isovist.

The previous chapter analysed how chronotopic space and time can be expressed in an interactive immersive audio-visual piece. This expression presumes the existence of the interlocutor who perceives and interprets visual and audio information and is the centre of attention of the author. This chapter introduces a new concept suggesting to approach chronotope as an 'environment' subjectively perceived by the interlocutor.

6.1 Perception.

The communication between the author and the interlocutor, according to Bakhtin, assumes and requires understanding. I discussed the problem of understanding earlier and would like to return to it here from a practical point of view.

The problem of understanding in interactive immersive cinema is connected with the problem of visual and audio perception. Gordon (Gordon, 2004) analyses six main theories of visual perception. He points an important difference between the perception of natural world and the perception of the world of human culture:

Here, we have languages and symbols, two-dimensional patterns representing three-dimensional things, machines that move us passively through space. It is not surprising that human perceivers can usually cope with this artificial environment: they created it. But the ways in which perception engages with the artefacts of our culture may differ importantly from the ways in which it deals with the natural world.

(Gordon, 2004, p.215)

and concludes that:

there is as yet no satisfactory general theory of visual perception. For example, no theory has adequately united a full analysis of the environment *and* the cognitive aspects of seeing. No general theory has thoroughly incorporated and explained the motor aspects of seeing. The extent to which perception is determined by stimulation (involving bottom-up process) or knowledge (top-down process) has not been agreed upon.

(Gordon, 2004, p. 217)

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However, there are four statements about vision and visual perception derived from the different theories Gordon analysed, which are useful for this research:

1/ The visual perception is characterised by the active nature of a perceiver and the unity between sensory and motor systems. When expanded to apply to interactive immersive cinema, this statement stresses the value of immersion and the connection between movement, immersion and perception.

2/ Perception is dynamic and stimulus interactions produce new emergent properties. For interactive immersive cinema this means that perception of the same footage can change as the piece unfolds.

3/ While 'top-down' process allows one to correctly reconstruct and identify the whole based on incomplete or ambiguous stimuli, not every situation of perception involves constructive process and application of schemata. For interactive immersive cinema this means that for the interlocutor the perception can have a sensual, emotional and intuitive character.

4/ Perception is led by the law of Pragnanz, which declares that perception organises reality by reducing complex forms to a combination of simple ones. In interactive immersive cinema, this rule is applicable when the interlocutor is presented with multiple projections.

There are several questions concerning perception in interactive immersive cinema, which can be the subject of a separate study. One is the effect the shape of the installation room has on perception of the piece, for example, the difference between the installation space with a circular 360-degree projection screen and an installation in a rectangular room. A 360-degree screen has no axes and requires a continuous flow of images, while a rectangular space with clearly separated walls, ceiling and floor suggests clearly defined axes as well as allowing for gaps between projections.

In this study, I consider the 360-degree projection to be a special case of a rectangular space, and when I refer to the "installation space", I assume it to be a rectangular 3D volume, within which the interlocutor can enter and move around. The four walls, the floor and the ceiling serve as two-dimensional projection surfaces. Holograms can be projected freely in space unrelated to projection surfaces.

6.2 Environment perception. Isovist.

For the purpose of this research, I propose to describe the interlocutor's perception of the installation space and the projections as 'environment perception' rather than 'object perception'. The difference between the 'environment' and the 'object' perception was first articulated by Benedikt (Benedikt, 1979):

Whereas in object perception one studies space in terms of the perceived distance, depth, size or movement of isolated objects [...] in environment perception one is called upon to regard space (a) as somehow substantial rather than empty, (b) as being defined by visible surfaces not necessarily perceived as belonging to discrete objects, and (c) as having topological and formal qualities normally appreciated by continuous free movement through space by an observer always 'immersed' in the environment.

(Benedikt, 1979, p. 48)

Benedikt quotes the approach of J.J. Gibson who

defines the (visual) environment [...] as a surrounding "layout of surfaces" which gives *structure* to the light scattered from the surfaces. Environment perception, in his view, is merely *attention* to this structure [...] or information, found everywhere one can see as a result of the 'sheaf' of light rays.

(Benedikt, 1979, p. 48)

Benedikt proceeds to define environment as '*a field of light-borne information* in which the observer is immersed and which he samples in accordance with his intentions and curiosities.' He defines the notion of isovist as 'location-specific patterns of visibility', or, a field of light-borne information about the space at any given location (or, even more specifically, 'a set of all points in a bounded region [...] which are visible from a selected vantage point' (Benedikt, 1979, p. 49).

It is easy to visualize isovist by imagining a circular source of light attached to the head of the observer. As the observer moves from one vantage point to another, new areas of the space illuminate, while the others darken. Benedikt states that the size and shape of isovist are unique to the environment and the vantage point.

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A space, or, rather, an environment in Benedikt's sense can be defined as a combination of all possible isovists of the given space, or an isovist field. However, to visually describe an environment one needs a finite number of isovists, and, as Benedikt shows, often this number is very small. He calls it a '*sufficient set*'. All the vantage points of the different isovists belonging to the sufficient set can be connected in what he calls '*sufficient paths*'. The shortest path among them is called '*minimal path*'. Parts of the environment can be partially or totally concealed from each other, as well as partially or totally isolated. Further, Benedikt quotes a (limited) study pointing that the visual exposure felt by observers is directly connected with the size of an isovist. He also suggests that the analysis of the space through the notion of isovist will allow

(a) to predict trends, optima and limits on a variety of possible spatial behaviours and perceptions in a given environment, (b) to assess some basic spatial qualities of environments whose conscious or unconscious apprehension may guide or underlie 'higher' cognitions and behaviour, and (c) to create a basis for or a contribution to a fuller description of the environment.

(Benedikt, 1979, p.52)

Since Benedikt's article first appeared, isovist has been used for a variety of tasks in the domain of architecture, for example, for the analysis of the movement of the visitors in a museum, or for the analysis of the behaviour of passers-by in an urban environment. As Benedikt had anticipated, research has also showed that the analysis of isovist can predict behaviourally relevant properties of spaces. The concept of isovist has been employed to analyse the relationship between an environment, path and engagement, physical and social contexts of environments and the effect of place on space and social behaviour of the participants (for example, Akpan, 2011 and Akpan, 2013).⁵⁴ Koch (Koch, 2012) contemplated isovist as the representation of an ego-centred space and suggests to separate the isovist (the representation) from 'what it originally meant to represent' to use it 'as a vehicle for analysis and research' (Koch, 2012, p.19). Peponis, Dalton, Wineman and Dalton (Peponis et al., 2003) provided an interesting and relevant investigation of the effects of layout upon visitors' paths and behaviours,

⁵⁴ See also Wiener, et al., 2007, Mellinger, T., 2008

'Chronovist' conceptualization method: exploring new approaches to structuring narrative in interactive analysing accessibility and cross-visibility as factors affecting the engagement of visitors with the exhibition space and suggesting ways to model not only the spatial movement within the exhibition space, but also ways in which this movement corresponds and registers visual information presented in the exhibition space, 'particularly the arrangement of exhibits according to conceptual organizing themes' (Peponis et al., 2003, p.453). They analysed how a visitor reconstructs narrative sequences embedded in the exhibition by linking separate contents of spatially separated individual exhibits, having developed techniques to register how conceptual structure can be embedded in layout design.

This study, however, takes the notion of isovist to a new field by suggesting that the properties of a chronotope expressed in the installation space of an interactive immersive cinema piece can be analysed and to a certain extent rationalized and quantified through the application of the isovist concept. I suggest that the calculation and the analysis of the isovists of the chronotopes and the installation space could be the next stage in interactive immersive cinema authorship, following the preliminary planning stage described in Chapter 5. Techniques suggested by Peponis et al. and other researches can be used as one of the practical tools in the implementation of 'chronovist' conceptualization method.

6.3. Isovist and interactive immersive cinema.

In the subsequent discussion I use the term 'isovist' not only as applied to the visibility of the space, but as a general term for calculating the distribution of a certain spatial or temporal attribute from a vantage point throughout the space.

As suggested earlier the installation space can be considered an 'environment' – namely (recalling Benedikt's definition), a layout of surfaces revealed by and giving structure to light. Visual projections are manifestations of different structures of light and therefore can be treated as dynamic disjoint surfaces, in addition to the static joint surfaces that the installation space has.

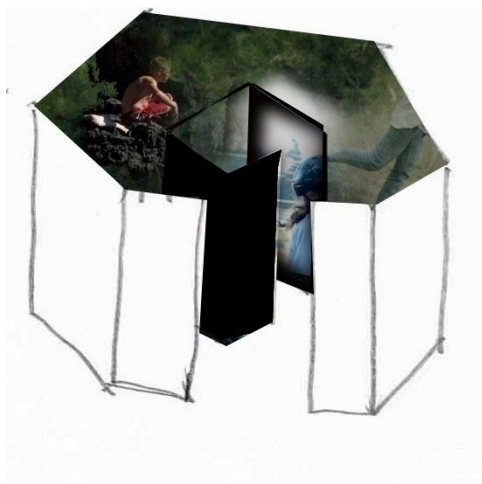
Unlike conceptually static (constant) architectural spaces described by Benedikt, the installation environment in interactive immersive cinema, due to the projections, is

'Chronovist' conceptualization method: exploring new approaches to structuring narrative in interactive dynamically ever-changing, responding to the actions and movements of the observer with visual and audio data.

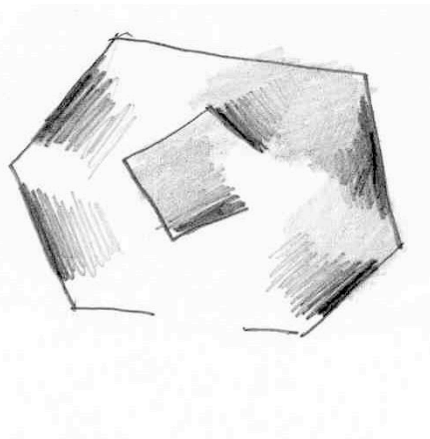
To build a virtual model of such space, to which isovist can be applied, one can first imagine an installation space where all projections are playing simultaneously (Figure 6-1A). The darkened areas on Figure 6-1B, similar to the graphical representation of isovist, show where most of the diverse clips are displayed.⁵⁵

Figure 6-1.

(A)



(B)



Since the precise number of clips and their sequence at every given moment (or in every 'vantage point in time') are dependent not only on the position of the interlocutor, but also on the interlocutor's actions, it is impossible to build a true isovist of the projections. However, the number of clips is finite and one can try to predict (using mathematical calculations) the states of the installation space at any given time. This prediction can be expressed in a form of a 3D model, similar to the 'walk-through' model of the isovist. If the clips are given certain numerically quantified semantic attributes – the degree of narrative significance and the relation to the overall story - this can be expressed on the model through the tint and intensity of the colour.

Therefore, we have two isovists – the isovist of the physical space where the piece is exhibited (installation space isovists), and the isovist of the virtual surfaces – the

⁵⁵ For the purpose of this investigation I will ignore for now the perceptual differences between video and audio.

'Chronovist' conceptualization method: exploring new approaches to structuring narrative in interactive projections (screen space isovists). How can they correlate with the chronotope of the piece?

6.3.1 Iovist of a chronotope.

As discussed earlier, the chronotope is a structured time-space continuum with defined unique characteristics, 'intrinsic connectedness of temporal and spatial relationships that are artistically expressed' (Bakhtin, 1994, p.84). It provokes and materializes events, constituting the narrative in an artistic text.

Time, as it were, thickens, takes on flesh, becomes artistically visible; likewise, space becomes charged and responsive to the movements of time, plot and history. This intersection of axes and fusion of indicators characterizes the artistic chronotope.

(Bakhtin, 1994, p. 84).

If a chronotope is considered (imagined as) a real physical space, it becomes possible to create 'isovists' and 'isovist fields' of this space, taking into consideration not only visibility, but other possible spatial and temporal characteristic of the chronotope, discussed earlier –gravity, velocity, connectivity, selectivity, time distortions and so on.

Each of these possible characteristics presumes certain preconditions. For example, gravity presumes a physical body creating the gravitational force (which may or may not be the Earth); connectivity presumes a division of the chronotope space into at least two areas; selectivity presumes the outside, which might or might not be included in the environment, and 'surfaces' or boundaries, which specify inclusion/exclusion, and so on.

There can be certain properties of the chronotope that are distributed evenly throughout the space and affect all other elements and properties. One example is the property of 'unreachable' (a property applied to the interlocutor and the objects or surfaces in the space). If the degree of 'unreachableness' is chosen to be constant (in other words, if the distance between the interlocutor and any object or surface of the space is always more or less equal to a certain number), this isovist field will be homogeneous throughout the chronotope, regardless of the change experienced by other properties.

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The same characteristics can be applied to the objective temporal properties of the chronotope – the pace and frequency of the events, the clock-time duration of the segments, the direction of time as distributed throughout the space.

A chronotope space also might have 'structural nodds' – regions with increased density of the fields, and 'obstacles' – the inclusion of foreign elements, which prevent the straightforward distribution of the isovist fields.

6.3.2 Example.

The distribution of these characteristics and elements in the chronotope space is determined by the nature of the chronotope and the author's intentions. To clarify this idea let us consider the chronotope of the road, already mentioned in (Chapter 2) when I discussed Weinbren's 'March'.

Bakhtin writes:

[o]f special importance is the close link between the motif of meeting and the chronotope of the road ('the open road'), and of various types of meeting on the road. In the chronotope of the road, the unity of time and space markers is exhibited with exceptional precision and clarity.

(Bakhtin, 1981, p.98)

The chronotope of the road has several structural elements:

- (1) it implies a one-directional vector of movement;
- (2) it has cross-roads which bring in the possibility of a change of direction as well as the introduction of new elements ('meeting');
- (3) it can have turns, changing the view and the outlook of the space;
- (4) it can have rises and falls, when 'the road' goes up and down, thereby, creating additional difficulty or easing of the movement;
- (5) the 'road' can disappear or be obstructed, requiring an effort for a continuation of the movement.

The first characteristic – movement – applies to the whole of the space, while other elements can be distributed and combined freely 'along the road'. Let us imagine these

'Chronovist' conceptualization method: exploring new approaches to structuring narrative in interactive elements existing in separate sections as on a wooden Brio set: one has the cross-road, another has a sharp turn, yet another has a 'level crossing' which can be open or closed, and so on. The elements can be arranged in a sequence one after another following the vector of movement, as they would be in a narrative (Figure 6-2), or they can be imagined as existing separately in a commonly defined, limited area – the installation space (Figure 6-3).

Figure 6-2. Elements of a road arranged in a sequence.

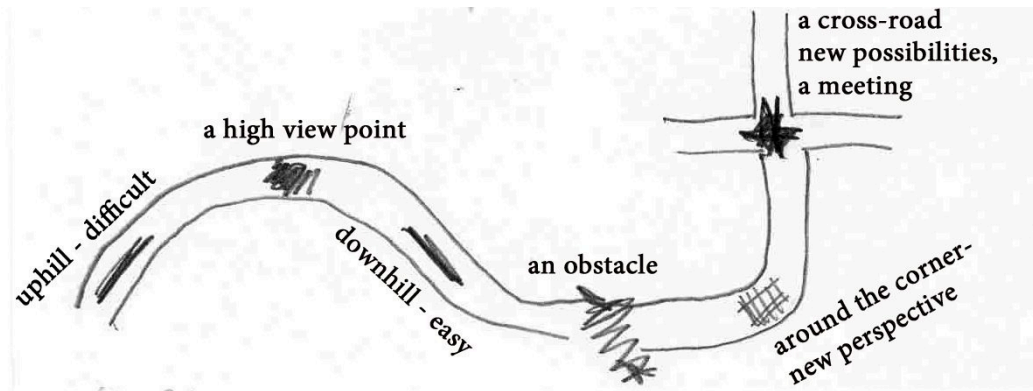
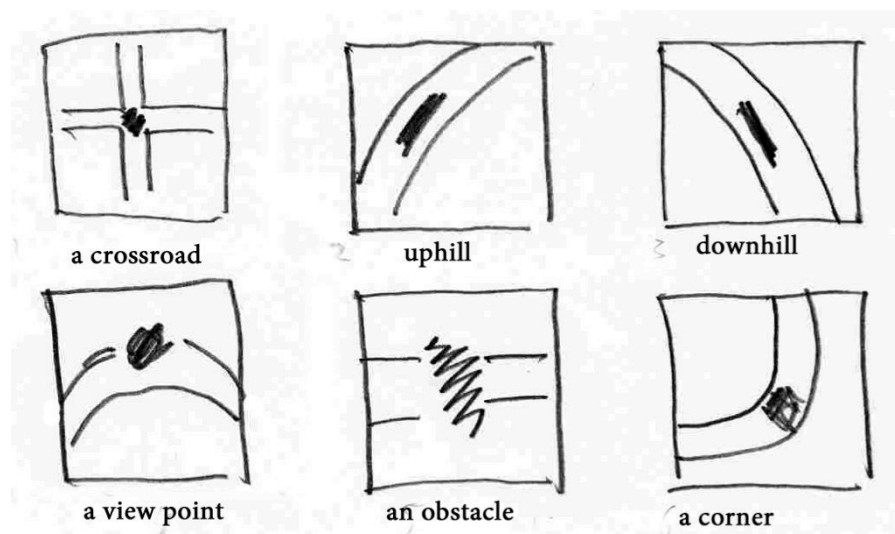


Figure 6-3. Elements of a road as separate blocks.



We can visualise a common boundless area containing a cluster of chronotope elements. For each of the elements isovists and isovist fields can be calculated and drawn. The elements can be then arranged in the common area in such a way, that the combination of their respective isovist fields works most efficiently according to the author's intentions and the overall chronotope of the piece.

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Figure 6-4 and 6-5 show a layout with overlapping elements and fields intensified by the mutual proximity. Figure 6-6 shows a more spread-out layout with areas of relatively low fields, providing a more 'paced down' experience for the interlocutor.

Figure 6-4. An arrangement of 'road' elements within a common area.

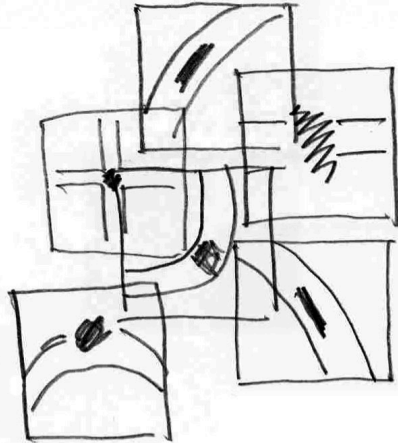


Figure 6-5. Overlapping 'fields' and axes of the elements arranged in a common space.

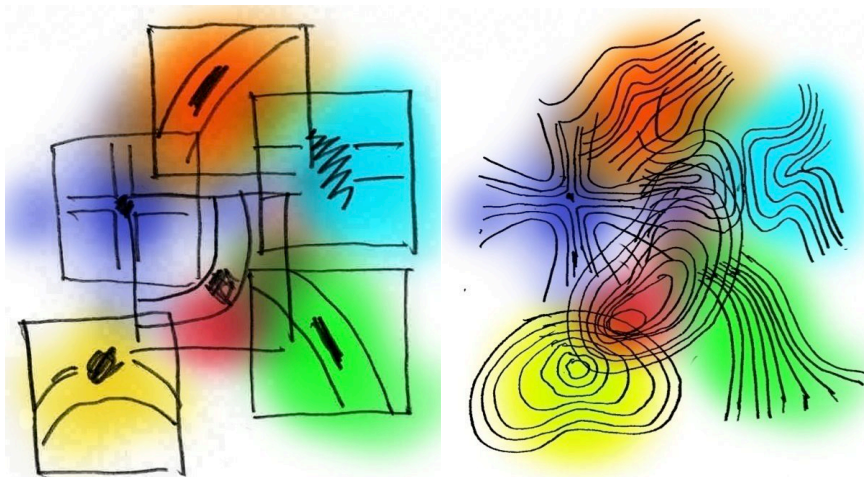


Figure 6-6. Elements are adjacent but don't overlap.

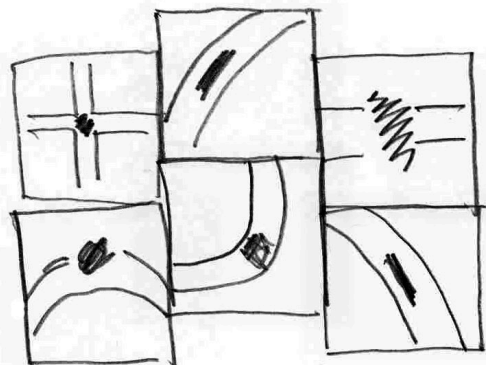


Figure 6-7. Elements are separated by 'neutral' space.

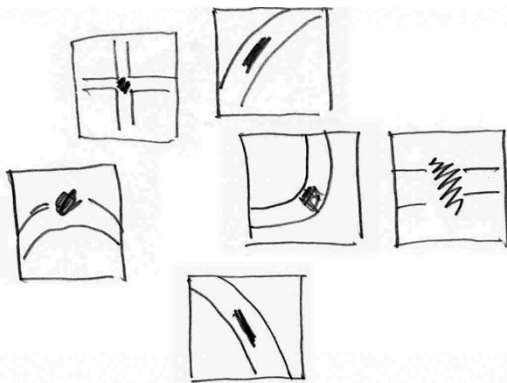
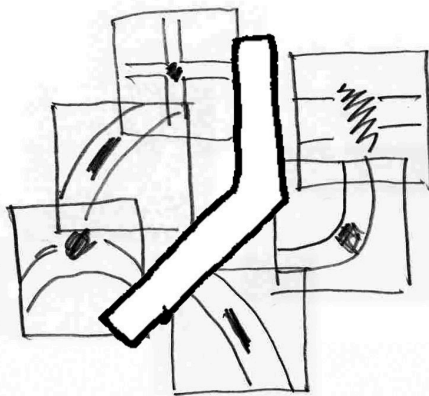


Figure 6-8 shows yet another possibility where a foreign element is introduced in the common area, creating a different configuration of the overlapping fields.

Figure 6-8. A configuration with a foreign element introduced in the space.



Now, the boundaries of the environment can be drawn (Figure 6-9, 6-10, 6-11 and 6-12 respectively).

Figure 6-9.

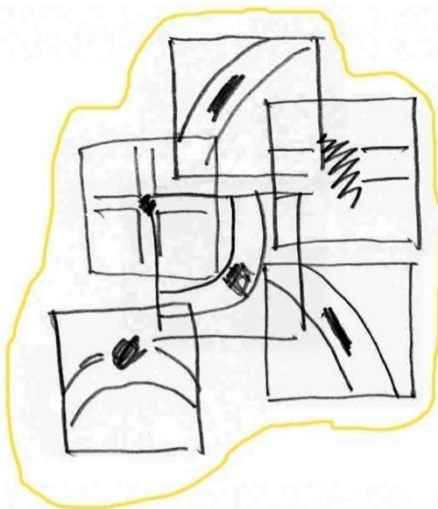


Figure 6-10.

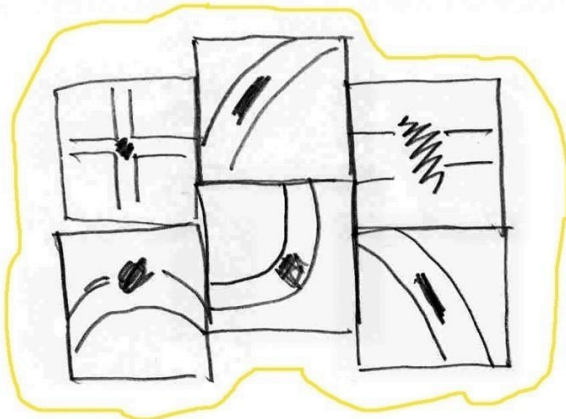


Figure 6-11.

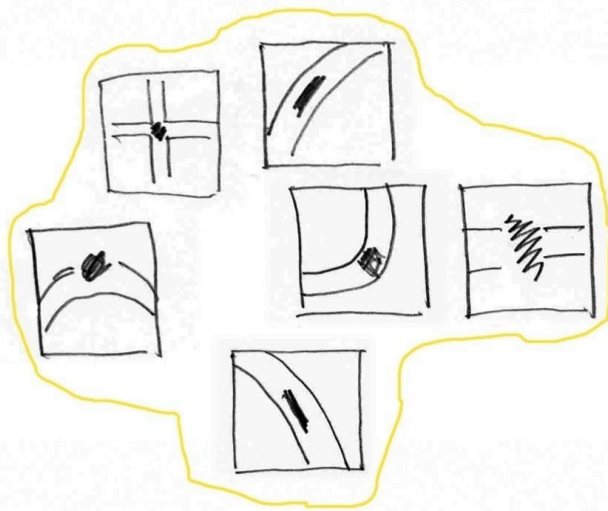
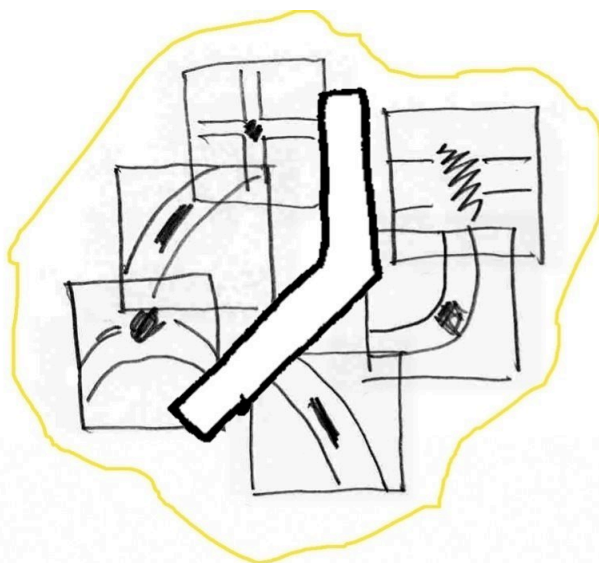


Figure 6-12.



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The influences of all fields from every vantage point within the common area can be calculated. The result is a model of the isovist fields of the chronotope, or a 'chronovist'.

6.3.3 Implications.

'Chronovist' has been developed as a conceptualisation method, which would allow to approach the design of a narrative interactive immersive audio-visual piece from a completely new perspective - the perspective of chronotopic environment explored by the interlocutor. While it empathises interactive narrative as the first-person experience of the interlocutor, it can also be used to design interactive narratives where the interlocutor has been given the role of the observer (for example, for a 'remixed' version of above-mentioned 'Landscape One').

I suggest that the 'chronovist' conceptualisation can be extended to be used as a basis for practical application, therefore providing a unifying method from the inception of the piece to its production. It combines the formality of structure with subordination to the 'theme' of the artistic utterance to be expressed in the work.

The practical application can be done in two ways:

1. If the author is working with a specific installation space, the 'chronovist' method can provide the basis for the modification/adjustment of the physical space and the arrangement of the projections. The isovist of the specific installation space is first compared with the combined isovists of the chronotopes of the piece. If possible, the model of the chronotope is adjusted to modify its isovist so that it is more congruent to the isovist of the installation space. If this is impossible or undesirable, the installation space is modified, for example, by introducing dividers or other foreign elements (Figure. 6-12).

2. If the installation space is not specified, the chronovist method can be used as the basis for calculating the isovist of the physical space of the installation and, subsequently, to develop the specifications for the required installation space (Fig. 6-9), similar to the process of designing an architectural environment based on the isovists-calculated analysis of the desired behaviour patterns of the visitors or isovists-based

'Chronovist' conceptualization method: exploring new approaches to structuring narrative in interactive space visibility analysis.⁵⁶ The isovist of the projections (screen-space isovist) is always developed last in this sequence and follows the isovist of the chronotope as closely as possible.

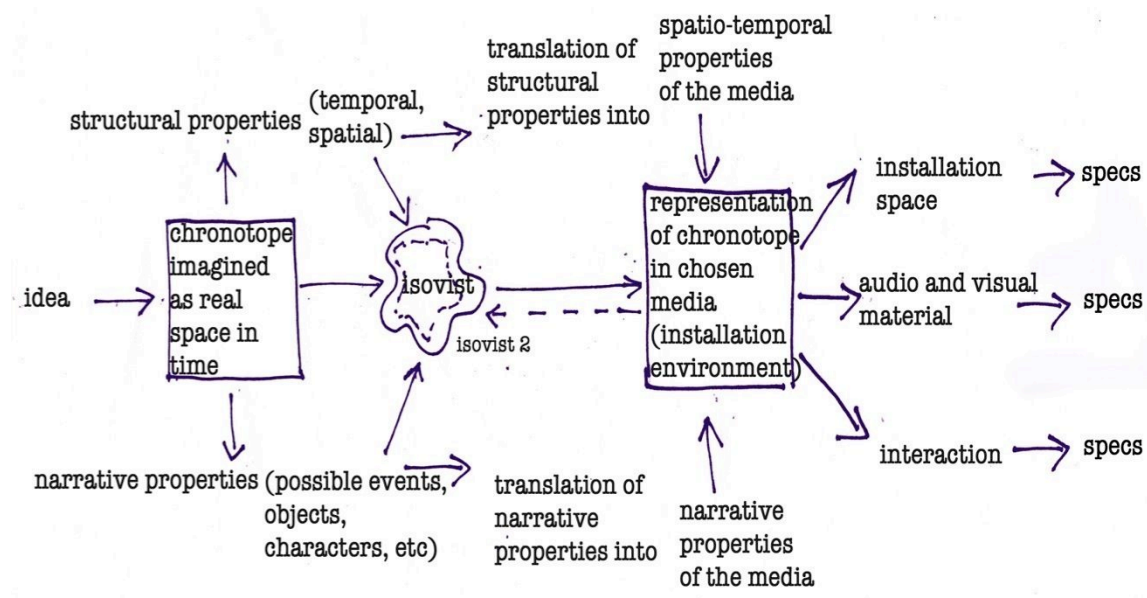
6.3.4. Audio isovist.

For the purpose of this research, I prioritise visual component of interactive immersive cinema and consider sound secondary. It should be noted, however, that sound has its own properties - ontological (it has been mentioned earlier that while image is a representation, sound is a copy, a double) and cognitive⁵⁷, which should be considered when planning an interactive immersive piece. A sonic isovist can be different from the visual one, creating yet another level of fused chronotopes. Perception of space and time through sound and sonic 'chronovist' requires a separate investigation, which, because of lack of space, is outside the scope of this research.

6.4. Summary of the concept.

The chart on Figure 6-13 shows the summary of the 'chronovist' authorship method. I will now elaborate on each step of the conceptualisation process.

Figure 6-13.



⁵⁶ For example, research into Visibility Graph Analysis developed at The Bartlett Graduate School; or a commercially offered services at www.aisophyst.nl

⁵⁷ see, for example Plack, C.J., 2005. *The sense of hearing*, Mahwah, N.J: Lawrence Erlbaum Associates.

6.5. Detailed application.

I will now describe in more detail how I suggest the conceptualisation method can be followed.

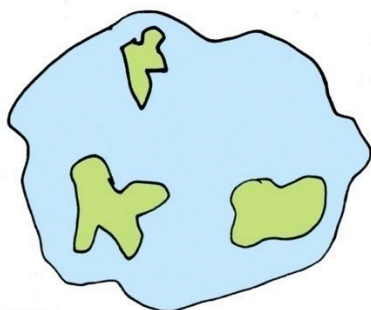
6.5.1. Defining the chronotopes of the piece and their hierarchy.

The first step stems from the overall idea and intention of the piece and requires the author to identify the chronotopes of the intended piece.

Bakhtin insists on a chronotope being 'a formally constructive category' with 'an intrinsic *generic* significance' (Bakhtin, 1981, p. 85). Chronotopes, according to Bakhtin, always start as historical assimilation of isolated aspects which become a generic form, later 'reinforced by tradition; ... in their subsequent development they continued stubbornly to exist, up to and beyond the point at which they had lost any meaning that was productive in actuality or adequate to later historical situations' (Bakhtin, 1981, p.85). Developing Bakhtin's argument further, it is possible to say that not only is every artistic text inevitably chronotopic, but that a chronotope is always impregnated with a variety of potential artistic texts, and precedes them. It makes it possible to discuss chronotopes of the intended text before the text has been created.

It has been mentioned that chronotopes can be divided into two categories: overlaying and situational. Overlaying chronotopes apply to the whole of the artistic text, while situational ones can function in specific places affecting only immediately adjacent areas (Figure 6-14).

Figure 6-14.



overlaying (blue) and situational (yellow) chronotopes

Both overlaying and situational chronotopes can be pre-existing - already identified and explored in existing artistic texts ("the chronotope of the road", "the chronotope of

'Chronovist' conceptualization method: exploring new approaches to structuring narrative in interactive an adventure novel" etc.) or new and original - 'discovered' and described by the author. For example, "the chronotope of behind-the mirror-world" in Lewis Carroll's 'Through the Looking Glass' (Carroll, 1871) or "the chronotope of the flat world" in Flatland by E. A. Abbott (Abbott, 1992), though not defined by the writers, are completely invented and clearly defined in their artistic texts.

To identify possible overlaying and situational chronotopes the original idea can be analysed with the help of the following questions:

- 1/What situation/ environment is most suitable for the intended narrative to unfold?
- 2/How does this environment differ (in spatial and temporal properties) from the immediate environment in which the author finds herself? How can it be described?
- 3/ Does this environment presuppose specific kinds of events that cannot happen anywhere else?
- 4/Are there any existing cultural paradigms it can be related or attributed to?

Bakhtin's methods of chronotopic analysis of existing texts - Greek adventure novel, Rabelais, Idyllic novel etc. (Bakhtin, 1981) - can be reversed to help to identify the chronotopes of texts yet to be discovered or created.

It is important to stress that such analysis of the spatio-temporal properties of the chronotope of an (existing or potential) artistic text is never separated from the content of the text, from the meaning of the artistic utterance.

At this stage the chronovist approach provides a useful analytic framework for shaping and deepening the original intention of the author, as well as for moving towards the implementation of the idea.

6-5-2. Describing structural properties for each of the chronotopes.

From the general description of the chronotopes one can proceed to a more detailed 'break-down' of their spatial, temporal and narrative properties.

Spatial and temporal properties.

Bakhtin insists on the inseparability of space and time and suggests that we consider time a fourth dimension of space, following Einstein's Theory of Relativity (Bakhtin,

'Chronovist' conceptualization method: exploring new approaches to structuring narrative in interactive (Lorino, 1981, p.85). However, for this research it is important to distinguish two different notions. One is the inseparable fusion between space and time expressed in chronotope, where space is actualized through time and time is actualized through space, similar to the inseparability of space and time as expressed in Einstein's work. The other one is the 'fourth dimension' gained by a simultaneous actualization in the environment of all possible chronotopic events in all possible spatial locations. This is the 'fourth dimension' related to 'screen-time' and the interlocutor, and expressed, in our case, in the dynamic isovist of the installation environment.

In previous chapters possible categories have been already mentioned that can be used to describe temporal and spatial properties of chronotope:

1/ order (both temporal and spatial) - sequences, milestones, cycles, timescales, continuity and discontinuity, acceleration and deceleration, boundaries and crossings as suggested by Lorino (Lorino, 2010);

2/ diachronic relationship - axes, directions and powers; and

3/ synchronic relationship of motion and rest as suggested by Zoran (Zoran, 1984, pp. 318-319).

It is not possible to reduce the complexity of spatio-temporal relationship in chronotope to a few calculable variables; any description of a chronotope would be inevitably subjective. However, I believe it is possible to suggest a framework for such description, which would facilitate the translation of the chronotope's properties into media in which this chronotope is eventually actualized. Using Lorino's and Zoran's approach to chronotopic structure, I propose to use the following descriptive categories, applicable to both time and space (See Fig. 6-15):

-limited or boundless;

-stretched or collapsed (condensed);

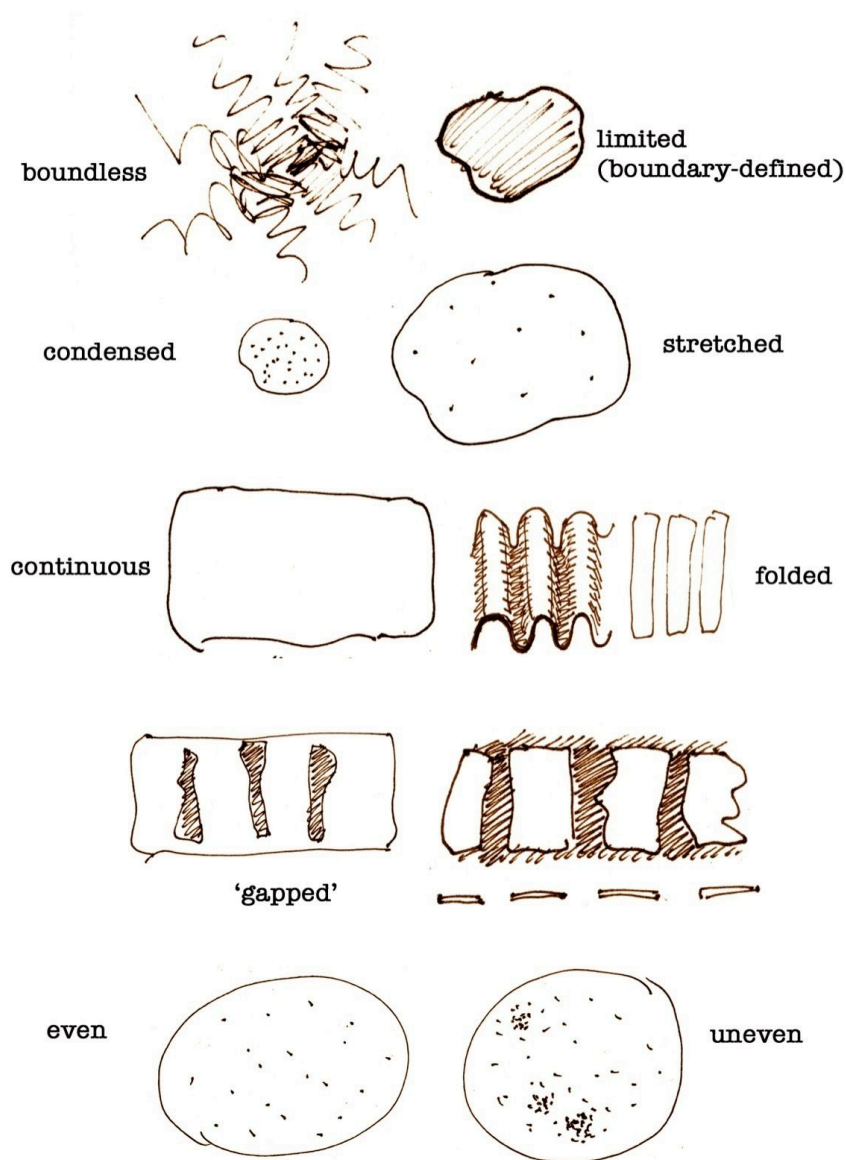
-revealed or folded;

-continuous or broken (gapped);

-uneven or even;

-linear or cycled.

Figure 6-15.



These categories can describe both temporal and spatial characteristics of chronotope: direction of time, its duration, speed of events, tempo/frequency (for temporal characteristics); selectivity/framing, relations between elements and perspective/ POV (for spatial characteristics, as has been shown previously).

How can these characteristics be expressed?

Limited or boundless: is expressed through the interaction with a boundary. The 'limited' requires a fixed vantage point, while the 'boundless' requires a dynamic one.

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Stretched or collapsed (condensed): is expressed through distance and relationship between elements (for space) and duration and speed of events and frequency (for time).

Revealed or folded: is expressed through discrepancy in other characteristics when a property changes abruptly without being interrupted.

Continuous or broken (gapped): expressed through the interaction with a boundary and requires some indication of the limitedness of the gap and the continuation of the chronotope beyond it.

Uneven or even: expressed through the distribution of spatial and temporal properties (fixed vantage point), and through time-dependent or space-dependent variability within the properties (dynamic vantage point).

Linear or cycled: expressed through repetition and requires a fixed vantage point.

6.5.3. Narrative properties.

Narrative or plot-inducing and plot-producing properties of the chronotope are potential events, characters, objects and situations inherent to it (Lorino classifies them as aims, means, traits, obstacles, generic activities, roles and characters (Lorino, 2010). They can be classified into the categories I used when discussed the Pionerka and Greek adventure novel examples:

- objects and characters;
- clusters of stories and potential conflicts;
- the role of the interlocutor.

Spatial and temporal properties of a chronotope are always expressed through narrative elements. Selectivity, framing, relations between elements and perspective cannot be apprehended and measured without objects and characters. Direction of time, its duration, speed of events, tempo/frequency require actualised plots and the interlocutor.

Zoran writes that in chronotope 'movement is incarnated in space and fully realized' (Zoran, 1984, pp. 318); in other words, a chronotope needs a protagonist to be actualized.

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First, 'a sufficient set' of narrative elements for the given chronotope is identified; then, when the chronotope model is translated into interactive immersive cinema, one of these elements can be substituted with the interlocutor. This substitution allows the interlocutor to experience the chronotope directly and subjectively. The mode of interaction between the substituted narrative element and the rest of the elements will determine the mode of interaction between the interlocutor and the piece.

6.5.4. Isovist of the chronotope.

This conceptualisation stage consists of drawing 'isovist fields' of each chronotope treated as a 'self-contained independent space' - based on the identified structural properties and their distribution in relation to the interlocutor's location, movement and other possible actions.

Individual 'self-contained spaces'/ chronotopes then are combined into one unifying space of the piece, thereby forming a dynamic isovist of the combined space.

This dynamic isovist will become the basis for creating an installation environment.

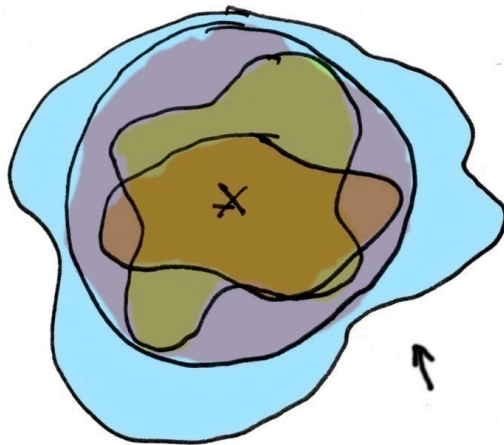
Dynamic and fixed vantage point.

It is important to stress that in this research the concept of isovist - location-specific patterns of visibility', or, a field of light-borne information about the space at any given location (or, even more specifically, 'a set of all points in a bounded region [...] which are visible from a selected vantage point' (Benedikt, 1979, p. 49) - has been expanded and modified. It is still used in the sense of a field of light-borne information about the space when the installation space is described. However, when the concept is applied to chronotope, isovist describes location-specific patterns of structural properties of the chronotope in question, and the distribution of these properties as related to a selected vantage point - the location of the interlocutor. These properties are revealed to the interlocutor through the interaction, and as a response to the interlocutor's actions.

The character of such distribution in relation to the installation space can be dynamic or fixed. In a dynamic distribution of the vantage point, the interlocutor remains the centre of a chronotope regardless of the interlocutor's location in the physical space of the actual installation, 'porting' it around in the same way a turtle wears its shell. The change from one chronotope to another can be triggered not by the spatial coordinates

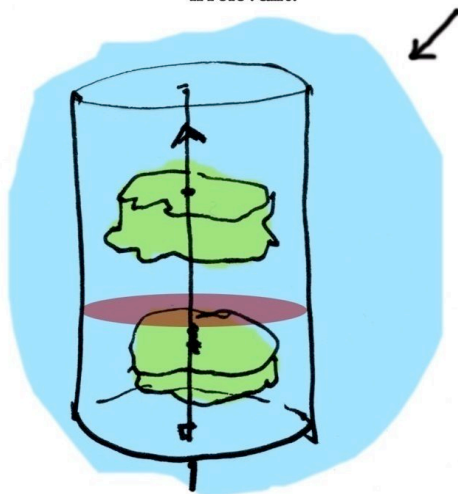
'Chronovist' conceptualization method: exploring new approaches to structuring narrative in interactive of the interlocutor, but by the interlocutor's actions (gestures, vocal signals, etc.) and the passage in clock-time of the interaction. (Figure 6-16).

Figure 6-16.



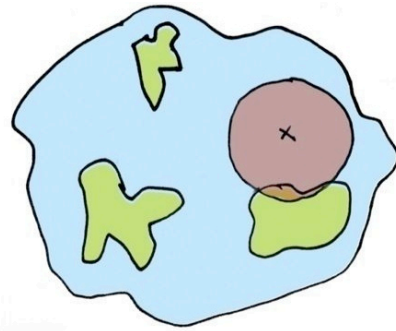
Temporally separated spatially centred chronotopes (overlying and situational) spreading from a dynamic vantage point.

Temporal progression of the interlocutor.
Spatial position of the interlocutor is irrelevant.

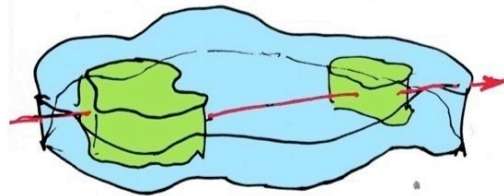


In a fixed vantage point distribution, chronotopes are localised in particular places in the installation space and, on movement, the interlocutor transcends them, experiencing different 'concentrations' of chronotope properties, from the chronotope's 'border', where the properties are at their weakest, to the chronotope's core, where the properties are at their strongest (Fig. 6-17).

Figure 6-17.



chronotopes with the interlocutor (red) and interference area



space-distributed chronotopes and the interlocutor's progression

Fixed and dynamic distribution can be combined in one piece. For example, chronotopes can be localized within particular places of the installation space, but multiple chronotopes can be pinned to the same physical coordinates. So the change from one chronotope to another can still be triggered not only by the physical movement of the interlocutor in the installation space, but also by the interlocutor's actions (gestures, vocal signals, etc.) and the passage of clock-time of the interaction (Figure 6-18). Or, there might be one or several dynamically distributed chronotopes centred around the interlocutor, encompassing the whole of the installation space and hosting a variety of fixed locally-pinned chronotopes (Figure 6-19).

Figure 6-18.

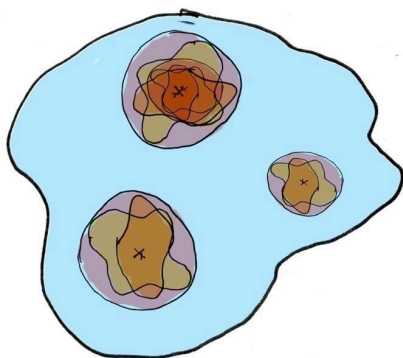
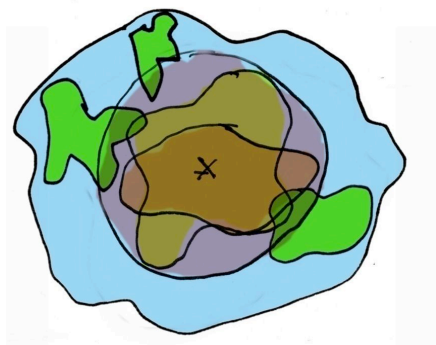


Figure 6-19.



The decision about fixed or dynamic vantage point distribution of situational chronotopes is made by the author and is determined by the overall concept of the piece.

Drawing a dynamic isovist.

The described method is designed to be used as a conceptualisation tool without the need for mathematically calculated isovists.

However, it would also be possible to use one of the existing architectural isovist software, modified to allow for the input of different variables, instead of 'visibility'. One way to generate isovists are programmes designed to create generative algorithms from input data, for example, Grasshopper 3d⁵⁸. However, there are software, plug-ins and calculations allowing specifically for dynamic modelling of 3D isovists of custom spaces, for example, Omnivista. Omnivista, developed in 1999 (Conroy-Dalton and Dalton, 2001), is an isovist-generating application, which uses 2d plans of environment to generate isovists from any location, as well as generating fields of isovists and providing a way to visualise to how isovist properties change from one location in the environment to another.

Taking similar software as a starting point, it should be possible to substitute visibility with another user-defined value, thus making it a potential tool for generating a 'chronovist' model of an interactive narrative environment. This would allow the creation of a dynamic 'walk-through' model of a chronotope with colour-coded rendering of the dynamic distribution of the different structural and narrative properties of the chronotope.

⁵⁸ www.grasshopper3d.com

6.5.5. Translation of chronotope properties into the properties of chosen media.

This step translates the isovist of the chronotope into the chosen media of the piece.

To do that the author would

- consider the properties of the media and the means of time and space representation;
- identify how the structural and narrative properties of the chronotope can be expressed in the chosen media;
- decide which narrative element of the chronotope will be substituted with the interlocutor (Figure 6-20).

Figure 6-20. Example of spatial and temporal properties expressed as variables and calculated as isovists.

property	variable	how it is expressed	how it can be changed/interacted with
Space 1/visibility	Darkness/brightness	1/The brightness of the projections	The movement, the actions, the spatial position and the voice of the interlocutor can affect the degree of brightness
2/distance	Far/ close	1/ framing 2/the size of projections 3/ spatial position of the projections	The movement and the spatial position of the interlocutor can trigger the change in the framing, size of the projections and their spatial position.
Time 1/ frequency/tempo	Faster/Slower	1/frequency of the appearance of new projections 2/ speed of projections	The movement, the actions and the spatial position of the interlocutor can trigger the change in the frequency of the appearance of new projections and their projected speed.

Once the properties of the media have been matched to the properties of the chronotope, a new dynamic isovist set (the isovist of the installation environment) can be drawn taking into consideration the properties of the media. This isovist takes into consideration multiple properties:

- 1/ light-borne information about the environment (a combination of the installation space and the projections);

'Chronovist' conceptualization method: exploring new approaches to structuring narrative in interactive 2/ spatial and temporal properties of the chronotope represented in the projections and distributed in the installation space, altering the mental image of the real space for the interlocutor).

So, effectively, the isovist of the installation environment is an isovist of an interlocutor's ideal mental construct of the spatio-temporal space where he/she moves and acts. Studying this isovist allows the author to visualise and anticipate the interlocutor's interaction with the piece.

To ensure immersive qualities of the installation, changes in perceived spatial and temporal characteristics of the chronotope must be triggered by spatially and temporally executed actions of the interlocutor: movement in space.

Narrative properties of the chronotope can be revealed both by movement in space and voice.

6.5.6. Preproduction and production.

The next step is designing a physical environment (a combination of audio and visual projections in an installation space) based on the drawn dynamic isovist.

As shown above, the isovist of the installation environment shows how the installation is to function – what is to be seen, heard and experienced by the interlocutor. To create a real-life installation from this conceptualisation the author would need to trace the effect to its source, now devising the installation environment to produce an already known result - in the same manner an architectural space is constructed based on a pre-designed isovist. The author would need to break the model of the installation environment into distinct production elements:

1/ the characteristics and specs of the installation space devised based on the chronovist of the installation;

2/ the specifications and the content of audio/visual material (its content, size, distribution, movement, interaction algorithms, programming software etc.), based on the chronovist of the installation and the spatio-temporal properties of the fused chronotope of the piece;

'Chronovist' conceptualization method: exploring new approaches to structuring narrative in interactive 3/ the interlocutor's interaction mode - which is to reveal spatio-temporal and narrative properties of the fused chronotope of the piece as shown in the chronovist of the installation.

6.6. Conclusion.

This chapter has summarised the proposed 'chronovist' conceptualisation method in the form of six distinct steps, based on the analysis developed in previous chapters. The framework is built on Bakhtin's concept of chronotope and presents a novel comprehensive authorship method for interactive immersive media, combining the concept, the content and implementation. In the next chapter I describe some sample applications of the method.

7. CHAPTER 7. Using the 'chronovist' conceptualisation method.

The previous chapters have described stages of the proposed authoring framework for an interactive immersive cinema based on a 'fused chronotopes' approach.

The proposed authorship framework is built on Bakhtin's concept of chronotope as a spatio-temporal entity, which, once ingrained in an artistic text, has plot-inducing and plot-producing ('narrative') properties.

How can the planning framework described above be used in a real life situation, when an author faces the task of planning, designing and producing an interactive audio-visual piece? I will analyse the creative process using two hypothetical examples. In the first example I will show the development of a project from the original idea to pre-production stage. In the second example I will show how an interactive audio-visual piece can be developed using one of original Bakhtin's chronotopes, namely the chronotope of a Greek adventure novel.

7.1 Example 1. Pionerka.

'Pionerka' is my proposal for a first-person interactive story set in a Moscow communal apartment and covering a time period starting in 1976 and ending in 2000. It is a story specially conceived for interactive immersive cinema and 'chronovist' framework. The intention of the piece is to immerse the viewer into the world of a Soviet child through a first-person experience and simultaneously to tell a universal story about growing up, to create such narrative experiences that can challenge the viewer's knowledge or perception of the world and to provide emotional experiences outside the scope of normal everyday life. It is essential that the interactive dimension allows for the story to be experienced first-hand and in first person, which is impossible in conventional media.

The table on Figure 7-1 summarises what creative decisions need to be made about the piece. The intended narrative/concept of the piece (to provide an interlocutor with an experience of the 1970s in the Soviet Union viewed from a child's perception) leads to identifying the overlying and the situational chronotopes (motifs) in which this narrative can take place.

Figure 7-1. Conceptualisation questions and planning steps.

1. Intended narrative/concept of the piece.	2. Overlying chronotopes and situational chronotopes (motifs).	3. Characteristics of each of the chronotopes. (general concept description)	3.1 how space and time are structured and altered (structural details).	3.2 what events, objects and characters are inherent to this chronotope.	4. The clusters of stories/plots that can happen in the defined chronotopes (potential conflicts).	5. The role of the interlocutor or in these plots.	6. The extent of explicitness in the response of the author to interlocutor's reactions.
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7.1.1. Chronotopes.

The chosen overlying chronotopes for the piece are 'Soviet stagnation time' and 'Childhood'. The situational chronotope is 'Communal apartment'. The first two chronotopes are inherent to the concept, and a well-articulated idea of the piece usually provides the author with at least one clear overlying chronotope.

The situational chronotopes could have been different – for example, it could have been a 'funfair park', or 'boy-scout camp', or even, as unreal as a 'dream'. However, the 'communal apartment' is highly specific and does not exist anywhere outside a Soviet reality, so the choice of this chronotope reinforces the main chronotope of the piece.

Once the chronotopes have been named, the next step is to identify and describe the properties of each of the chronotopes according to the above structural points as I will demonstrate below.

7.1.1.1 *The chronotope of 'Soviet stagnation time'.*

Time.

The chronotope of 'Soviet stagnation time' can be defined by the 'stalled' temporality (time moves slowly or doesn't move at all), and 'restricted' enclosed spatiality (the movement is allowed in a limited number of prescribed directions), almost barren of objects. Occasional 'thrusts' of time result in 'crumbling' and 'degrading' materiality.

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Space.

The chronotope also incorporates an unattainable and unreachable 'outside', which incarnates all the opposite properties of space and time: time 'outside' is understood as fast-moving, space as unrestricted, infinite and crowded with objects. In fact, the 'outside' becomes another chronotope, which cannot, however, be experienced first-hand as the rest of the chronotopes in the piece (Figure 7-2).

Figure 7-2. Chronotope of 'Soviet stagnation time' (time and space).

1. INTENDED NARRATIVE/ CONCEPT OF THE PIECE.	2. OVERLYING CHRONOTOPES AND SITUATIONAL CHRONOTOPES (MOTIFS).	3. CHARACTERISTICS OF EACH OF THE CHRONOTOPES. (GENERAL CONCEPT DESCRIPTION)	3.1 HOW THE SPACE AND TIME ARE STRUCTURED AND ALTERED (STRUCTURAL DETAILS).
<p>The work aims to provide an interlocutor with an experience of the 1970s in the Soviet Union perceived from a child's perspective.</p>	<p>1. Chronotope of 'Soviet stagnation time' (overlying)</p>	<p>The chronotope of 'Soviet stagnation time' is characterised by: -'stalled' temporality (time moves slowly or doesn't move at all); -'restricted' enclosed spatiality (the movement is allowed in a limited number of prescribed directions), almost barren of objects; -occasional 'thrusts' of time result in 'crumbling' and 'degrading' materiality; -incorporates an unobtainable and unreachable 'outside', which incarnates all the opposite properties of space and time: time 'outside' is understood as fast-moving, the space as unrestricted, infinite and crowded with objects.</p>	<p>TIME: 1/'stalled' temporality</p> <p>SPACE: 2/'restricted' spatiality (the movement is allowed in a limited number of prescribed directions), almost barren of objects.</p> <p>TIME/SPACE: 3/occasional 'thrusts' of time resulting in 'degrading' materiality.</p> <p>SPACE: 4/ presence of an unobtainable and unreachable (but observable) 'outside'. The time 'outside' is fast-moving, the space is unrestricted, infinite and crowded with objects.</p>

7.1.1.2 The chronotope of childhood.

The chronotope of childhood is a highly subjective variable chronotope adapting to concurrent historicity and self-reflection of the culture, as well as to the very personal experiences of the author.

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For this piece, it can be defined by the ultimate subjectivity and relativity of the tempo-spatial continuum, centred on the interlocutor. The progression of time is uneven, alternating between stillness and sudden thrusts; spatiality is selective (some objects loom while others become invisible) and is characterised by gradually expanding in size while contracting in scale (Figure 7-3).

Figure 7-3. Chronotope of 'childhood' (time and space).

1.INTENDED NARRATIVE/ CONCEPT OF THE PIECE.	2. OVERLYING CHRONOTOPES AND SITUATIONAL CHRONOTOPES.	3.CHARACTERISTICS OF EACH OF THE CHRONOTOPES. (GENERAL CONCEPT DESCRIPTION)	3.1 HOW THE SPACE AND TIME ARE STRUCTURED AND ALTERED (STRUCTURAL DETAILS).
	2. Chronotope of 'Childhood' (overlying)	The chronotope of ' Childhood ' can be defined by ultimate subjectivity and relativity of tempo-spatial continuum, centred on the interlocutor. The progression of time is uneven, alternating between stillness and sudden thrusts; the spatiality is selective (some objects loom while others become invisible) and is characterised by gradually expanding in size while contracting in scale.	<p>SPACE: 1/exaggerated perspective: centred on the interlocutor</p> <p>TIME: 2/temporality alternates between stillness and sudden thrusts (similar to the temporality of 'stagnation time' chronotope).</p> <p>SPACE: 3/spatiality is selective and is characterised by the (temporal) expansion in scope while contracting in scale.</p>

7.1.1.3 The chronotope of 'communal apartment'.

The chronotope of 'communal apartment' in this example localises the chronotopes of 'stagnation time' and 'childhood'. The 'communal apartment' is a tempo-spatial construct with the dominance of spatiality over temporality. I define it as a space of long corridors, shared kitchens and bathrooms, and numerous rooms with many characters in each of them. The space is public, exposed, devoid of privacy and boundaries between individuals. The table on Figure 7-4 summarises these characteristics.

Figure 7-4. Chronotope of 'communal apartment' (time and space).

1.INTENDED NARRATIVE/ CONCEPT OF THE PIECE.	2. OVERLYING CHRONOTOPES AND SITUATIONAL CHRONOTOPES.	3.CHARACTERISTICS OF EACH OF THE CHRONOTOPES. (GENERAL DESCRIPTION)	3.1 HOW THE SPACE AND TIME ARE STRUCTURED AND ALTERED (STRUCTURAL DETAILS).
	<p>3. Chronotope of 'Communal Apartment' (situational)</p>	<p>The chronotope of 'Communal Apartment' in this example localises the chronotopes of 'stagnation time' and 'childhood'. The 'communal apartment' is a tempo-spatial construct with the dominance of spatiality over temporality. It is a space of long corridors, shared kitchens and bathrooms, and numerous rooms with numerous characters in each of them. The space is public, exposed, devoid of privacy and borders between individuals.</p>	<p>SPACE: 1/ the space of long corridors, shared kitchens and bathrooms, and numerous rooms with numerous characters in each of them.</p> <p>SPACE: 2/ the space is public, exposed, devoid of privacy and borders between individuals.</p>

7.1.2 Objects and characters.

The objects that inhabit the space have a structural relationship to the chronotopes, helping to express their properties. For example, clocks, watches and other time-expressing devices are used to stress stalled temporality and occasional thrusts of time of the 'stagnation' chronotope, and the uneven progression of time characteristic for the chronotope of childhood. Multiple copies of everything in the communal space – several light switches, several door bells, several tables in the kitchen - express the chronotope of the communal apartment with its attempts to create a surrogate 'private' space within a public and exposed one.

The protagonist of the piece is a child growing up in a communal apartment during the stagnation time; all three chronotopes take part in 'producing' the hero of the narrative. The chronotopes also suggest secondary characters – for example, the (absent) parents, a scary neighbour and so on. The table on Figure 7-5, Figure 7-6 and Figure 7-7 show the relationship between the identified structural characteristics of each chronotope and objects and characters inherent to them.

Figure 7-5. Chronotope of 'Soviet stagnation time' (objects and characters)

1.INTENDED NARRATIVE/ CONCEPT OF THE PIECE.	2. OVERLYING CHRONOTOPES AND SITUATIONAL CHRONOTOPES.	3.1 HOW THE SPACE AND TIME ARE STRUCTURED AND ALTERED (STRUCTURAL DETAILS).	3.2 WHAT OBJECTS AND CHARACTERS ARE INHERENT IN THIS CHRONOTOPE.
<p>The work aims to provide an interlocutor with an experience of the 1970s in the Soviet Union perceived from a child's perspective.</p>	<p>1. Chronotope of 'soviet stagnation time' (overlying).</p>	<p>TIME: 1/'STALLED' TEMPORALITY SPACE: 2/'RESTRICTED' SPATIALITY almost barren of objects. TIME/SPACE: 3/OCCASIONAL 'THRUSTS' OF TIME resulting in 'degrading' materiality. SPACE/TIME: 4/ presence of an unobtainable and unreachable (but observable) 'OUTSIDE'. The time 'outside' is fast-moving, the space is unrestricted, infinite and crowded with objects.</p>	<p>OBJECTS: 1/CLOCKS, watches, CALENDARS, other time-expressing devices; 2/artefacts relating to the social reality of the time: BREJNEV'S PORTRAITS; newspapers; RADIO with the same news broadcast etc. CHARACTERS: A CHILD growing up during the stagnation time.</p>

Figure 7-6. Chronotope of 'childhood' (objects and characters).

1.INTENDED NARRATIVE/ CONCEPT OF THE PIECE.	2. OVERLYING CHRONOTOPES AND SITUATIONAL CHRONOTOPES.	3.1 HOW THE SPACE AND TIME ARE STRUCTURED AND ALTERED (STRUCTURAL DETAILS).	3.2 WHAT OBJECTS AND CHARACTERS ARE INHERENT IN THIS CHRONOTOPE.
<p>The work aims to provide an interlocutor with an experience of the 1970s in the Soviet Union perceived from a child's perspective.</p>	<p>2.Chronotope of 'childhood' (overlying)</p>	<p>SPACE: 1/EXAGGERATED PERSPECTIVE: centred on the interlocutor TIME: 2/temporality alternates between STILLNESS and SUDDEN THRUSTS (similar to the temporality of 'stagnation time' chronotope). SPACE: 3/spatiality is selective and is characterised by the (temporal) EXPANSION IN SCOPE while CONTRACTING IN SCALE.</p>	<p>OBJECTS: 1/PARENT'S PHOTO; 2/ surrounding objects (for example, a BED; a DESK); 3/ a PIONEER'S RED TIE; 4/a 'forbidden object' – a BOOK ON A SHELF high up; 5/ a MIRROR. CHARACTERS: 1/PROTAGONIST (A CHILD) 2/PARENTS (absent) 3/ an evil and/or scary character (NEIGHBOURS).</p>

Figure 7-7. Chronotope of 'communal apartment' (objects and characters).

1. INTENDED NARRATIVE/ CONCEPT OF THE PIECE.	2. OVERLYING CHRONOTOPES AND SITUATIONAL CHRONOTOPES.	3.1 HOW THE SPACE AND TIME ARE STRUCTURED AND ALTERED (STRUCTURAL DETAILS).	3.2 WHAT OBJECTS AND CHARACTERS ARE INHERENT IN THIS CHRONOTOPE.
The work aims to provide an interlocutor with an experience of the 1970s in the Soviet Union perceived from a child's perspective.	3. Chronotope of 'Communal Apartment' (situational)	<p>SPACE:</p> <p>1/ the space of LONG CORRIDORS, SHARED KITCHEN and BATHROOM, and numerous ROOMS with numerous characters in each of them.</p> <p>2/ the space is public, exposed, DEVOID OF PRIVACY AND BORDERS between individuals.</p>	<p>OBJECTS:</p> <p>MULTIPLE COPIES OF SIMILAR PERSONAL THINGS IN SHARED SPACES, for example: light switches; lights hanging down from the same ceiling; kitchen tables crowding the same kitchen; pots of the same size; etc.</p> <p>CHARACTERS:</p> <p>NEIGHBOURS</p>

7.1.3. Plots.

The choice of objects and characters from those inherent in the overlying and situational chronotopes will influence what plots these chronotopes can generate.

The plot-inducing properties of the chronotope are both experienced 'subjectively' - as potential interactions with the interlocutor - and 'objectively' – as events shown to the interlocutor. This work approaches interactive audio-visual media as the interlocutor's first-hand experience of fused chronotopes, and therefore will concentrate mostly on 'subjective' plots.

Freytag in his classic text on dramatic structure (Freytag, 2008 [1923]) accords conflict the defining role in plot development. This view is shared by Robert McKee who insists that 'nothing moves forward in a story except through conflict' (McKee, 1999, p. 210) and by David Herman (Herman, 2002), who argues that conflict is constitutive of narrative.

Therefore, for the purpose of this research, plot-generating properties of chronotopes can be described through the identification of potential conflicts present in the chronotope.

In the chronotope of 'Soviet stagnation time' I have identified four main conflicts:

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1/the conflict created by the tension between waiting for an event and the ‘stalled’ temporality of the chronotope;

2/the conflict created by the tension between the interlocutor’s desire to move somewhere and the ‘restricted’ prescribed spatiality of the chronotope;

3/the conflict created by the tension between the interlocutor’s establishing connection with an object and the object’s gradual ‘degradation’ due to the ‘time thrusts’ and

4/the conflict created by the tension between the unreachable but observable and desired ‘there/outside’ and the surrounding ‘here/inside’.

Figure 7-8. Chronotope of ‘Soviet stagnation time’ (conflicts and plots).

1. INTENDED NARRATIVE/ CONCEPT OF THE PIECE.	2. OVERLYING CHRONOTOPES AND SITUATIONAL CHRONOTOPES.	3.1 HOW THE SPACE AND TIME ARE STRUCTURED AND ALTERED (STRUCTURAL DETAILS).	3.2 WHAT OBJECTS AND CHARACTERS ARE INHERENT IN THIS CHRONOTOPE.	4. THE CLUSTERS OF STORIES/ PLOTS THAT CAN HAPPEN IN THE DEFINED CHRONOTOPES (POTENTIAL CONFLICTS).
The work aims to provide an interlocutor with an experience of the 1970s in the Soviet Union perceived from a child’s perspective.	1. Chronotope of ‘Soviet stagnation time’ (overlying)	<p>TIME: 1/‘STALLED’ TEMPORALITY</p> <p>SPACE: 2/‘RESTRICTED’ SPATIALITY almost barren of objects.</p> <p>TIME/SPACE: 3/OCCASIONAL ‘THRUSTS’ OF TIME resulting in ‘degrading’ materiality.</p> <p>SPACE/TIME: 4/ presence of an unobtainable and unreachable (but observable) ‘OUTSIDE’. The time ‘outside’ is fast-moving, the space is unrestricted, infinite and crowded with objects.*</p>	<p>OBJECTS: 1/CLOCKS, watches, CALENDARS, other time-expressing devices; 2/artefacts relating to the social reality of the time: BREJNEV’S PORTRAITS; newspapers; RADIO with the same news broadcast etc.</p> <p>CHARACTERS: A CHILD growing up during the stagnation time.</p>	<p>1/ conflict between WAITING FOR AN EVENT and the ‘STALLED’ TEMPORALITY of the chronotope.</p> <p>2/conflict between the interlocutor’s DESIRE TO MOVE somewhere and the RESTRICTED PRESCRIBED SPATIALITY of the chronotope.</p> <p>3/ conflict between the interlocutor’s establishing CONNECTION WITH AN OBJECT and the OBJECT’S GRADUAL ‘DEGRADATION’ due to the ‘time thrusts’.</p> <p>4/conflicts between the unreachable, but observable and desired ‘THERE/ OUTSIDE’ and the surrounding ‘HERE/INSIDE’.</p>

The chronotope of ‘childhood’ supposes a number of potential plots, characters and objects. In the chosen example this chronotope is secondary. The piece uses the three

‘Chronovist’ conceptualization method: exploring new approaches to structuring narrative in interactive tempo-spatial characteristics of ‘childhood’ – the temporal change of the spatial dimensions from ‘oversized’ to ‘small’ with the simultaneous expansion of the scope (space expands in scope while contracting in scale); the spatial selectiveness and the exaggerated perspective (Figure 7-9). However, here the plot-generating properties of this chronotope are not fully employed.

Figure 7-9. Chronotope of ‘childhood’ (conflicts and plots).

1. INTENDED NARRATIVE/ CONCEPT OF THE PIECE.	2. OVERLYING CHRONOTOPES AND SITUATIONAL CHRONOTOPES.	3.1 HOW THE SPACE AND TIME ARE STRUCTURED AND ALTERED (STRUCTURAL DETAILS).	3.2 WHAT OBJECTS AND CHARACTERS ARE INHERENT IN THIS CHRONOTOP E.	4. THE CLUSTERS OF STORIES/ PLOTS THAT CAN HAPPEN IN THE DEFINED CHRONOTOPES (POTENTIAL CONFLICTS).
The work aims to provide an interlocutor with an experience of the 1970s in the Soviet Union perceived from a child’s perspective.	2. Chronotope of ‘Childhood’ (overlying)	<p>SPACE: 1/EXAGGERATED PERSPECTIVE: centred on the interlocutor</p> <p>TIME: 2/temporality alternates between STILLNESS and SUDDEN THRUSTS (similar to the temporality of ‘stagnation time’ chronotope).</p> <p>SPACE: 3/spatiality is selective and is characterised by the (temporal) EXPANSION IN SCOPE while CONTRACTING IN SCALE.</p>	<p>OBJECTS: 1/PARENT’S PHOTO; 2/ surrounding objects (for example, a BED; a DESK); 3/ a PIONEER’S RED TIE; 4/a ‘forbidden object’ – a BOOK ON A SHELF high up; 5/ a MIRROR.</p> <p>CHARACTERS: 1/PROTAGONIST (A CHILD) 2/PARENTS (absent) 3/ an evil and/or scary character (NEIGHBOUR)</p>	<p>1/ conflict between the HEIGHT OF THE PROTAGONIST (the child) and the DIMENSIONS OF THE SURROUNDING WORLD (things are too big or out of reach)</p> <p>2/ conflict between DESIRES and IMPOSED RESTRICTIONS</p> <p>3/ conflict between the SPATIAL SELECTIVENESS and the EXAGGERATED PERSPECTIVE of the protagonist and the REAL RELATIONSHIP between the objects.</p>

In the chronotope of the ‘communal apartment’ there are several structurally important conflicts: the tension between the private and the shared; between publicity and intimacy; between the will and desire of the interlocutor and the invasive presence and actions of ‘others’. There is also a possibility to be lost or endangered by other characters that freely inhibit the protagonist’s space.

Figure 7-10. Chronotope of 'communal apartment' (conflicts and plots).

1. INTENDED NARRATIVE/ CONCEPT OF THE PIECE.	2. OVERLYING CHRONOTOPES AND SITUATIONAL CHRONOTOPES.	3.1 HOW THE SPACE AND TIME ARE STRUCTURED AND ALTERED (STRUCTURAL DETAILS).	3.2 WHAT OBJECTS AND CHARACTERS ARE INHERENT TO THIS CHRONOTOPE.	4. THE CLUSTERS OF STORIES/ PLOTS THAT CAN HAPPEN IN THE DEFINED CHRONOTOPES (POTENTIAL CONFLICTS).
<p>The work aims to provide an interlocutor with an experience of the 1970s in the Soviet Union perceived from a child's perspective.</p>	<p>3. Chronotope of 'Communal Apartment' (situational)</p>	<p>SPACE: 1/ the space of LONG CORRIDORS, SHARED KITCHEN and BATHROOM, and numerous ROOMS with numerous characters in each of them. 2/ the space is public, exposed, DEVOID OF PRIVACY AND BORDERS between individuals.</p> <p>TIME: 1/ 24-hour clock rhythm imposed on an amorphous structure: no difference between day and night, between summer and winter.</p>	<p>OBJECTS: MULTIPLE COPIES OF SIMILAR PERSONAL THINGS IN SHARED SPACES, for example: light switches; lights hanging down from the same ceiling; kitchen tables crowding the same kitchen; pots of the same size; etc.</p> <p>CHARACTERS: NEIGHBOURS</p>	<p>1/ conflict between the PRIVATE and the SHARED; between PUBLICITY and INTIMACY;</p> <p>2/ conflict between the WILL and DESIRE of the interlocutor and the INVASIVE presence and actions of 'OTHERS'.</p> <p>3/ possibility to be LOST OR ENDANGERED by other characters who freely inhibit the protagonist's space.</p>

7.1.4. Interlocutor.

Once the tensions and the potential plots have been identified, the next task is to define the role of the interlocutor in these plots: to decide where the interlocutor will be a protagonist and where the interlocutor can be an observer, without breaking the first-hand engagement with the chronotope of the piece.

In this piece the communication with the interlocutor is structured so that he/she assumes the role of the protagonist – the growing-up child.

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This decision determines what the interlocutor can see and hear (what he/she is shown and told), how his/her movements are restricted, and how the interaction between the interlocutor and the piece (the communication between the interlocutor and the author) happens (Figure 7-11).

Figure 7-11. The role of the interlocutor.

1.INTENDED NARRATIVE/ CONCEPT OF THE PIECE.	2. OVERLYING CHRONOTOPES AND SITUATIONAL CHRONOTOPES).	3.1... 4	5. THE ROLE OF THE INTERLOCUTOR
The work aims to provide an interlocutor with an experience of the 1970s in the Soviet Union perceived from a child’s perspective.	1. Chronotope of ‘Soviet stagnation time’ (overlying) 2.Chronotope of ‘Childhood’ (overlying) 3. Chronotope of ‘Communal Apartment’ (situational)	(...)	<p>The interlocutor is given the role of protagonist – a growing up child:</p> <p>1/ the SIZE of the objects in space CHANGES accordingly to the child’s growing up;</p> <p>2/there are LIMITATIONS, RULES AND RESTRICTIONS the child should obey; disobedience is punished;</p> <p>3/nothing is assumed as known unless the interlocutor has already encountered it in the piece; new things are taught and explained to the ‘child’; the protagonist accumulates knowledge about the world as the piece progresses</p>

7.1.5. Granularity.

Granularity refers to the smallest discrete unit of visual or audio material and the smallest discrete unit of space and time defined for each piece. In production, it defines the shortest and smallest individual shot used in the installation, the smallest unit of time used to measure clock-time, the smallest unit of space used to measure the interlocutor’s movements, etc.

The final structural decision at this stage is the extent of explicitness in the response of the author to the interlocutor’s actions. This decision relates to the model of interaction as a conversation or utterance exchange between the author and the interlocutor and is expressed through the ‘granularity’ of the structure – the size of ‘story granules’ or ‘bytes’. The finer the granularity, the greater is the sense of immersion and interaction; however, the more resource-consuming is the piece. Granularity is limited by the smallest possible unit of the medium employed. Using an analogy with language, a coarser granularity and greater explicitness would mean that the author’s utterances are

'Chronovist' conceptualization method: exploring new approaches to structuring narrative in interactive expressed as sentences and paragraphs; finer granularity and lesser explicitness would mean utterances as separate words or even syllables (Figure 7-12).

Figure 7-12. Granularity.

1. INTENDED NARRATIVE/ CONCEPT OF THE PIECE.	2. OVERLYING CHRONOTOPE S AND SITUATIONAL CHRONOTOPE S (MOTIFS).	3.1... 4	5. THE ROLE OF THE INTERLOCUTOR	6. GRANULARITY
The work aims to provide an interlocutor with an experience of the 1970s in the Soviet Union perceived from a child's perspective.	1. Chronotope of ' Soviet stagnation time ' (overlying) 2. Chronotope of ' Childhood ' (overlying) 3. Chronotope of ' Communal Apartment ' (situational)	(...)	The interlocutor is given the role of protagonist – a child, growing up as the interaction progresses: 1/ the SIZE of the objects in space CHANGES accordingly to the child's growing up 2/ there are LIMITATIONS, RULES AND RESTRICTIONS the child should obey; disobedience is punished 3/ nothing is assumed as known unless the interlocutor has already encountered it in the piece; new things are taught and explained to the 'child'; the protagonist accumulates knowledge about the world as the piece progresses	The granularity of the piece changes as the interaction progresses: 1/ granularity is coarser in the beginning of the piece (longer story-bites) to allow the interlocutor to get acquainted with the chronotope and to reflect the perception that time moves slower when the child is small; 2/ granularity decreases (becomes finer) in each time-slice to accommodate the growing familiarity with the chronotope and the alteration in time perception as the child grows up (time moves faster)

The table on Figure 7-13 brings together the above stages in one concise document.

Figure 7-13. Conceptualisation and planning (complete table).

1. INTENDED NARRATIVE / CONCEPT OF THE PIECE.	2. OVERLYING CHRONOTOPES AND SITUATIONAL CHRONOTOPES.	3.1 HOW THE SPACE AND TIME ARE STRUCTURED AND ALTERED (STRUCTURAL DETAILS).	3.2 WHAT OBJECTS AND CHARACTERS ARE INHERENT TO THIS CHRONOTOPIC.	4. THE CLUSTERS OF STORIES/ PLOTS THAT CAN HAPPEN IN THE DEFINED CHRONOTOPES (POTENTIAL CONFLICTS).	5. THE ROLE OF THE INTERLOCUTOR	6. GRANULARITY
<p>The work aims to provide an interlocutor with an experience of the 1970s in the Soviet Union perceived from a child's perspective.</p>	<p>1. Chronotope of 'Soviet stagnation time' (overlying)</p>	<p>TIME: 1/'STALLED' TEMPORALITY</p> <p>SPACE: 2/'RESTRICTED' SPATIALITY almost barren of objects.</p> <p>TIME/SPACE: 3/OCCASIONAL 'THRUSTS' OF TIME resulting in 'degrading' materiality.</p> <p>SPACE/TIME: 4/ presence of an unobtainable and unreachable (but observable) 'OUTSIDE'. The time 'outside' is fast-moving, the space is unrestricted, infinite and crowded with objects.*</p>	<p>OBJECTS: 1/CLOCKS, watches, CALENDAR S, other time-expressing devices; 2/artefacts relating to the social reality of the time: BREJNEV'S PORTRAITS ; newspapers ; RADIO with the same news broadcast etc.</p> <p>CHARACTERS: A CHILD growing up during the stagnation time.</p>	<p>CONFLICTS/PLOTS 1/ conflict between WAITING FOR AN EVENT and the 'STALLED' TEMPORALITY of the chronotope. 2/conflict between the interlocutor's DESIRE TO MOVE somewhere and the RESTRICTED PRESCRIBED SPATIALITY of the chronotope. 3/ conflict between the interlocutor's establishing CONNECTION WITH AN OBJECT and the OBJECT'S GRADUAL 'DEGRADATION' due to the 'time thrusts'. 4/conflicts between the unreachable, but observable and desired 'THERE/ OUTSIDE' and the surrounding 'HERE/INSIDE'</p>	<p>ROLE OF THE INTERLOCUTOR. The interlocutor is given the role of protagonist – a Soviet child, growing up as the interaction progresses.</p> <p>PROCEDURAL RULES RELATED TO CHRONOTOPIC There are LIMITATIONS, RULES AND RESTRICTIONS the child should obey; disobedience is punished</p>	<p>GRANULARITY Granularity of the piece changes as the interaction progresses: 1/ granularity is coarser in the beginning of the piece (longer story-bites) to allow the interlocutor to get acquainted with the chronotope and to reflect the perception that time moves slower when the child is small; 2/ granularity decreases (becomes finer) in each time-slice to accommodate the growing familiarity with the chronotope and the alteration in time perception as the child grows up (time moves faster).</p>

Figure 7-13 (cont.)

1. INTENDED NARRATIVE / CONCEPT OF THE PIECE.	2. OVERLYING CHRONOTOPES AND SITUATIONAL CHRONOTOPES	3.1 HOW THE SPACE AND TIME ARE STRUCTURED AND ALTERED (STRUCTURAL DETAILS).	3.2 WHAT OBJECTS AND CHARACTERS ARE INHERENT TO THIS CHRONOTOPE.	4. THE CLUSTERS OF STORIES/ PLOTS THAT CAN HAPPEN IN THE DEFINED CHRONOTOPES (POTENTIAL CONFLICTS).	5. THE ROLE OF THE INTERLOCUTOR	6. GRANULARITY
<p>The work aims to provide an interlocutor with an experience of the 1970s in the Soviet Union perceived from a child's perspective.</p>	<p>2. Chronotope of 'Childhood' (overlying)</p>	<p>SPACE: 1/EXAGGERATED PERSPECTIVE: centred on the interlocutor</p> <p>TIME: 2/temporality alternates between STILLNESS and SUDDEN THRUSTS (similar to the temporality of 'stagnation time' chronotope)</p> <p>SPACE: 3/spatiality is selective and is characterised by the (temporal) EXPANSION IN SCOPE while CONTRACTING IN SCALE.</p>	<p>OBJECTS: 1/PARENT'S PHOTO; 2/ surrounding objects (for example, a BED; a DESK); 3/ a PIONEER'S RED TIE; 4/a 'forbidden object' – a BOOK ON A SHELF high up; 5/ a MIRROR.</p> <p>CHARACTERS: 1/PROTAGONIST (a child) 2/PARENTS (absent) 3/ an EVIL and/or SCARY character (neighbours).</p>	<p>CONFLICTS /PLOTS 1/ conflict between the HEIGHT OF THE PROTAGONIST (the child) and the DIMENSIONS OF THE SURROUNDING WORLD (things are too big or out of reach); 2/ conflict between DESIRES and IMPOSED RESTRICTIONS; 3/ conflict between the spatial selectiveness and the exaggerated perspective perceived by the protagonist and the real relationship between the objects.</p>	<p>ROLE OF THE INTERLOCUTOR. The interlocutor is given the role of protagonist – a Soviet child, growing up as the interaction progresses.</p> <p>PROCEDURAL RULES RELATED TO CHRONOTOPE 1/ there are LIMITATIONS, RULES AND RESTRICTIONS the child should obey; disobedience is punished 2/ the SIZE of the objects in space CHANGES accordingly to the child's growing up 3/nothing is assumed as known unless the interlocutor has already encountered it in the piece; new things are taught and explained to the 'child'; the protagonist accumulates knowledge about the world as the piece progresses.</p>	<p>GRANULARITY Granularity of the piece changes as the interaction progresses:</p> <p>1/ granularity is coarser in the beginning of the piece (longer story-bites) to allow the interlocutor to get acquainted with the chronotope and to reflect the perception that time moves slower when the child is small;</p> <p>2/ granularity decreases (becomes finer) in each time-slice to accommodate the growing familiarity with the chronotope and the alteration in time perception as the child grows up (time moves faster).</p>

Figure 7-13 (cont.)

1. INTENDED NARRATIVE / CONCEPT OF THE PIECE.	2. OVERLYING CHRONOTOPES AND SITUATIONAL CHRONOTOPES.	3.1 HOW THE SPACE AND TIME ARE STRUCTURED AND ALTERED (STRUCTURAL DETAILS).	3.2 WHAT OBJECTS AND CHARACTERS ARE INHERENT TO THIS CHRONOTOPE.	4. THE CLUSTERS OF STORIES/ PLOTS THAT CAN HAPPEN IN THE DEFINED CHRONOTOPES (POTENTIAL CONFLICTS).	5. THE ROLE OF THE INTERLOCUTOR	6. GRANULARITY
<p>The work aims to provide an interlocutor with an experience of the 1970s in the Soviet Union perceived from a child's perspective.</p>	<p>3. Chronotope of 'Communal Apartment' (situational)</p>	<p>SPACE:</p> <p>1/ the space of LONG CORRIDORS, SHARED KITCHEN and BATHROOM, and numerous ROOMS with numerous characters in each of them.</p> <p>SPACE:</p> <p>2/ the space is public, exposed, DEVOID OF PRIVACY AND BORDERS between individuals</p>	<p>OBJECTS:</p> <p>MULTIPLE COPIES OF SIMILAR PERSONAL THINGS IN SHARED SPACES, for example: light switches; lights hanging down from the ceiling; kitchen tables crowding the same kitchen; pots of the same size; etc.</p> <p>CHARACTERS:</p> <p>NEIGHBOURS</p>	<p>CONFLICT S/PLOTS</p> <p>1/ conflict between the private and the shared; between publicity and intimacy;</p> <p>2/ conflict between the will and desire of the interlocutor and the invasive presence and actions of 'others'.</p> <p>3/ possibility to be lost or endangered by other characters who freely inhibit the protagonist's space.</p>	<p>ROLE OF THE INTERLOCUTOR.</p> <p>The interlocutor is given the role of protagonist – a Soviet child, growing up as the interaction progresses.</p> <p>PROCEDURAL RULES RELATED TO CHRONOTOPE</p> <p>1/ there are LIMITATIONS, RULES AND RESTRICTIONS the child should obey; disobedience is punished</p> <p>2/ the SIZE of the objects in space CHANGES accordingly to the child's growing up</p> <p>3/ nothing is assumed as known unless the interlocutor has already encountered it in the piece; new things are taught and explained to the 'child'; the protagonist accumulates knowledge about the world as the piece progresses.</p>	<p>GRANULARITY</p> <p>Granularity of the piece changes as the interaction progresses:</p> <p>1/ granularity is coarser in the beginning of the piece (longer story-bites) to allow the interlocutor to get acquainted with the chronotope and to reflect the perception that time moves slower when the child is small;</p> <p>2/ granularity decreases (becomes finer) in each time-slice to accommodate the growing familiarity with the chronotope and the alteration in time perception as the child grows up (time moves faster)</p>

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7.1.5. Implementation of chronotopes.

The next stage for the author is to determine how the spatial and temporal properties of the chronotopes (described in the table above) can be implemented through the structural characteristics of the media discussed earlier.

Figure 7-14. Implementation of chronotope in media. Spatial characteristics.

CHRONOTOPE OF 'CHILDHOOD' (OVERLYING)			
<p>SPACE: 1/EXAGGERATED PERSPECTIVE: centred on the interlocutor</p> <p>2/ EXPANDS IN SCOPE while CONTRACTING IN SCALE with every 'thrust' of time (time jump) as the protagonist 'grows up'</p>	<p>Selectivity/Framing</p> <p>1/framing of individual shots needs to reflect the exaggerated perspective from the protagonist's POV.</p> <p>2/ same objects and views are framed differently for different 'time-slices' – starting with objects being relatively big on screen (the frame is close to the outlines of the object) progressing to objects framed with space around so that they appear relatively small on screen.</p> <p>3/ Every object is filmed in different stages, from new to dilapidated, relative to the 'time-slice'</p> <p>4/ framing changes so that new areas are revealed from one time-slice to another as the interaction progresses.</p>	<p>Relationship between elements</p> <p>1/The relationship between elements needs to reflect the selective view of the world by a child; changing gradually to a more generalised view of the world by a grown-up.</p> <p>2/ the spatial relationship between elements (the distance between simultaneous projections) needs to reflect the change occurring in the space with every 'time thrust' - the expansion in scope and contraction in scale.</p>	<p>Perspective/POV</p> <p>1/ framing of individual shots needs to reflect the exaggerated perspective from the protagonist's POV.</p> <p>2/the height (horizon) of the POV changes (becomes higher) with every 'thrust' of time</p> <p>3/there might also be a change in lenses used; longer lenses in the beginning give an impression of bigger objects closer to the interlocutor; wider lenses make objects appear smaller, and places – more spacious.</p>

For spatial properties of the chronotope these characteristics are:

1/selectivity/framing;

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2/relationship between elements and

3/perspective/POV.

For temporal properties of the chronotope these characteristics are:

1/direction of time (order of events),

2/speed of events and their frequency

3/ duration of events/segments

4/ arrangement of simultaneous events.

The tables on Figure 7-14 and Figure 7-15 show an example of how some of these characteristics can be defined for 'the chronotope of childhood' in this piece.

Figure 7-15. Implementation of chronotope in media. Temporal characteristics.

CHRONOTOPE OF 'CHILDHOOD' (OVERLYING)			
TIME: '1/STALLED' TEMPORALITY 2/OCCASIONAL 'THRUSTS' OF TIME resulting in reduction of scale, expansion of scope and 'degrading' materiality.	Direction of time (order of events) 1/ usage of stills; freeze-frames and very slow motion can help to create the impression of 'stalled' temporality 2/ short loops of repeating events also can help to create the feeling of 'stalled' temporality 3/ jump-cuts can indicate and empathise time thrusts	Speed of events; frequency; tempo 1/ the tempo needs to change (speed up) as the interaction progresses 2/ the speed of events within the time-slices needs to reflect the nature of the event - 'interesting' events are fast; 'boring' events are slow. 3/ short loops of repeating events can help to create the feeling of 'stalled' temporality	Duration of events 1/ each time-slice segment has unlimited duration and can be stopped only by a certain action of the interlocutor 2/ duration of events as related to the duration of similar real events expressed in clock-time, differs depending on the attraction, salience and interest of the event for the interlocutor.

7. 1. 6. Summary.

As shown above, the structure of the piece centres on the viewer put in the position of a growing-up child. To express the characteristics of the overlying chronotopes the story is designed as several 'time-slices' and corresponding several relevant states of the world and each object in it. As the story progresses and the viewer moves from

'Chronovist' conceptualization method: exploring new approaches to structuring narrative in interactive one 'time-slice' to another, the space, the time and the objects will transform, reflecting the 'growing up' of the viewer character. From the way the story world will react to the viewer's actions, the viewer will be able to experience the rules by which the Soviet reality existed (in the author's interpretation).

The table on Figure 7-13 describes the properties of these chronotopes (overlying and situational) chosen for the piece.

These properties are translated into specific characteristics of spatial and temporal organisation of the space, shown on the tables on Figure 7-14 and Figure 7-15.

Based on these characteristics, 3D 'walkable' models of the isovists of the chronotopes can be calculated and rendered. They serve as the underlying structure according to which the installation space is designed and the distribution of projections is arranged.

7.2. Example 2. Greek Adventure Novel.

Now I will demonstrate how the author can use the suggested framework to design a new work taking chronotope as a starting point.

I will use the chronotope of a Greek adventure novel, explicitly described by Bakhtin (Bakhtin, 1981 pp.86 - 110). My aim is to show how a verbally defined chronotope can translate into an interactive immersive audio/visual piece.

It is interesting that independently from this research Bizzocchi and Grant in their article 'How Story Can Tell Games' (Bizzocchi, Grant, 2008) note that the chronotope of the Greek adventure novel described by Bakhtin is very similar to the structure of most 'first-person shooter games'. They make the suggestion that the characters inherent to this chronotope can be used as a model for game designers who can 'follow Bakhtin's succinct analysis of the challenges and potentials for characterisation within the boundaries of the Greek adventure genre' (Bizzocchi, Grant, 2008, p.12).

However, they limit the idea to the design of a character placed in 'action-driven space' and overlook the potential of designing the whole game based on the structure of the chronotope.

7.2.1 The description of the chronotope.

Bakhtin uses the example of an antique novel to support his study of the chronotope, together with other, more recently developed chronotopes that he identifies both in literary texts and in culture in general (see, for example, an analysis of the chronotope of the meeting, spanning from the literary to the physical world (Bakhtin, 1981, p.98)). I will outline the main characteristics of this chronotope.

The chronotope of the Greek adventure novel is characterised by 'adventure time'. This time is different from 'biological' time; it does not have real 'biological' duration and doesn't change anything in the life of the protagonists: 'it is, precisely, an extratemporal hiatus between two moments of biographical time' (Bakhtin, 1981, p.90). This time doesn't have to follow natural or biological cycles. If it did, the cycles would have imposed a limiting human dimension. For the same reasons this time cannot be attributed to any precise historical period either. It consists of separate discrete periods with rigidly organised measured and limited time, within which the protagonists have to fulfil a certain, time-limited task (an adventure). These independent periods 'are introduced [...] with specific link-words 'suddenly' and 'at just that moment' (Bakhtin, 1981, p. 92). Causal relationship doesn't exist, the normal logic of events is broken to give space to 'adventure time'; all moments of which are governed by chance – a chance coincidence, a concurrence, a chance rapture, a chance temporal disparity. Bakhtin calls it 'a specific initiating chance' (Bakhtin, 1981, pp.96-97).

The sequence itself - the chain of discrete and independent periods – does not have a temporal dimension, and it can be endlessly extended without any impact on the concluding event of the novel. So the chronotope can be described as a collection of independent unrelated enclosed temporal segments randomly, by chance, put in a sequence. The passage of time is without traces – the sequence of adventures can be shuffled or reversed, without any impact on themselves, the protagonists, or the output of the story. The chance concurrency and the chance disparity presume an extensive abstract space. The relationship between this space and the described time are, as Bakhtin notes, purely mechanical: 'the world of the Greek romance is of course

'Chronovist' conceptualization method: exploring new approaches to structuring narrative in interactive chronotopic, but the link between the space and time has, as it were, not an organic, but a purely technical (and mechanical) nature' (Bakhtin, 1981, p.99).

The space is vast and includes sea, land and a variety of countries. The spatial relationships are described by two characteristics - proximity and remoteness (and their different stages).

However, these seas, lands and countries are abstract. They do not have any specificity, which would have allowed them to represent any real country, sea or land. Bakhtin stresses that any adventure (any discrete temporal segment) is not space-specific and can be freely moved from one locale to another - in a similar fashion the segments can be shuffled in time:

The adventure chronotope is characterised by abstract, purely functional connection between the time and the space, by the reversible nature of temporal segments and by their detachment from any specific locale and the possibility to be moved to any other locale.

(Bakhtin, 1981, p. 100)⁵⁹

The degree of detail in this world is very approximate, as any concretization would have imposed its causality and spatial and temporal orders, limiting the power of chance and firmly placing adventure segments in a particular locale, preventing them from being freely moved in space and time.

Therefore, in an adventure chronotope the world is represented as abstractly 'foreign', unknown and undefined. Everything is described as an isolated phenomenon:

Isolated, unconnected curiosities and rarities fill the space of a foreign world in the Greek adventure novel. These self-sufficient, curious and exotic things are as accidental as the adventures themselves; they are made from the same matter – they are the frozen 'suddenly', the adventures which have become things, born by the same chance.

(Bakhtin, 1981, p. 102)⁶⁰

⁵⁹ The quote is in my translation, which I believe is more accurate. The translation in Bakhtin, 1981 reads: ' The adventure chronotope is thus characterized by a technical, abstract connection between space and time, by the reversibility of moments in a temporal sequence, and by their interchangeability in space.'(p.100)

Figure 7-16. Structural properties of the Greek adventure novel chronotope.

1..INTENDED NARRATIVE / CONCEPT OF THE PIECE.	2. OVERLYING CHRONOTOPES AND SITUATIONAL CHRONOTOPES (MOTIFS).	3.1 HOW THE SPACE AND TIME ARE STRUCTURED AND ALTERED (STRUCTURAL DETAILS).	3.2 OBJECTS AND CHARACTERS	4. THE CLUSTERS OF STORIES/POTENTIAL CONFLICTS	5. THE ROLE OF THE INTERLOCUTOR	6. GRANULARITY
<p>The piece is designed to provide a first-hand experience of the chronotope of Greek adventure novel, in other words, to experience the world of Greek adventure novels from the point of view of the protagonist</p>	<p>The adventure chronotope is characterised by abstract, purely functional connection between the time and the space, by the reversible nature of temporal segments and by their detachment from any specific locale and the possibility to be moved to any other locale. The protagonist is defined as a private person placed in an unknown foreign world. The chain of adventures experienced by the protagonist tests and challenges his/her identity, which is successfully reconfirmed, unchanged, by the end of the story.</p>	<p>TIME 1/Time is broken into separate unconnected interchangeable segments 2/Causal connections exist only within individual segments 3/ The passage of time doesn't change the space or the protagonist; it's traceless 4/ Time count is 'zeroed' in the beginning of each segment; within the segment, time is limited; the time count precipitates events; 5/ all moments of time are governed by chance: a chance coincidence, a concurrence, a chance rapture, a chance temporal disparity. SPACE 1/ each time segment has its own space; these spaces are not connected with each other 2/ space is abstract, generalized and derived of any specificity 3/ the space is described through two categories: proximity and remoteness 4/ Time and space are measured by the spatial movement of the protagonist. "suddenly"</p>			<p>The interlocutor assumes the role of protagonist, striving to preserve his/her initial aim /purpose despite the challenges imposed by adventures</p>	<p>The bit is equal to a distinctive completed movement of the interlocutor. Within individual 'segments', each distinctive completed movement of the interlocutor elicits narrative change in the piece; between the segments a random number of completed movements causes the start of a new segment</p>

All actions of the protagonist are '*reduced to enforced movement throughout the space [...] that is to a change in spatial location*' (Bakhtin, 1981, p.105). Bakhtin stresses that '*the spatial human movement provides the measurement for the space and time in the*

⁶⁰ The quote is in my translation. The translation in Bakhtin, 1981 reads: 'Thus in the Greek romance, the spaces of an alien world are filled with isolated curiosities and rarities that bear no connection to each other. These self-sufficient items – curious, odd, wondrous – are just as random and unexpected as the adventures themselves: they are made of the same material, they are congealed 'suddenly', adventures turned into things, offspring of the same chance' (p.102).

'Chronovist' conceptualization method: exploring new approaches to structuring narrative in interactive Greek adventure novel, and, therefore, for its chronotope' (Bakhtin, 1981, p. 105).⁶¹ The protagonist is defined as a private person placed in an unknown foreign world. The chain of adventures experienced by the protagonist tests and challenges his/her identity, which is successfully reconfirmed, unchanged, by the end of the story.

Figure 7-17 Properties of space in the Greek adventure novel chronotope.

<u>Space</u>	1.Selectivity/Framing	2.Relationship between elements	3.Perspective/POV
<p>1/ each time segment has its own space; these spaces are not connected with each other;</p> <p>2/ space is abstract, generalized and devoid of any specificity;</p> <p>3/ the space is described through two categories: proximity and remoteness;</p> <p>4/ time and space are measured by the spatial movement of the protagonist.</p>	<p>1/ approach to framing needs to be consistent throughout the segment but can differ from one segment to another to empathise the difference in spaces represented in different segments;</p> <p>2/ framing needs to empathise proximity and remoteness, which can be done by using extreme long lenses for proximity or extreme wide lenses for remoteness</p> <p>2/ same objects and views are framed in two states – 'proximity' - objects being relatively big on screen (the frame is close to the outlines of the object) and 'remoteness': objects framed with space around so that they appear relatively small on screen. There is no 'middle ground'.</p>	<p>1/The relationship between the elements needs to reflect the disjointed nature of space. Each object/shot exists separately.</p> <p>2/ events within each segment are connected by causal relationship and coincidence; however, each segment itself (consisting of sequences of projections) is not related to any other segment.</p> <p>3/ the location of projections in the installation space is random; each segment can be shown anywhere; projections within each shot are relative to each other but can be distributed anywhere in the installation space</p>	<p>1/The POV empathises the distance between the interlocutor and the events (the interlocutor remains 'a foreigner')</p>

⁶¹ The quote is in my translation. The translation in Bakhtin, 1981 reads: 'Human movement through space is precisely what provides the basic *indices* for measuring space and time... in Greek romance, which is to say, for its chronotope' (p.105).

Figure 7-18 Properties of space in the Greek adventure novel chronotope.

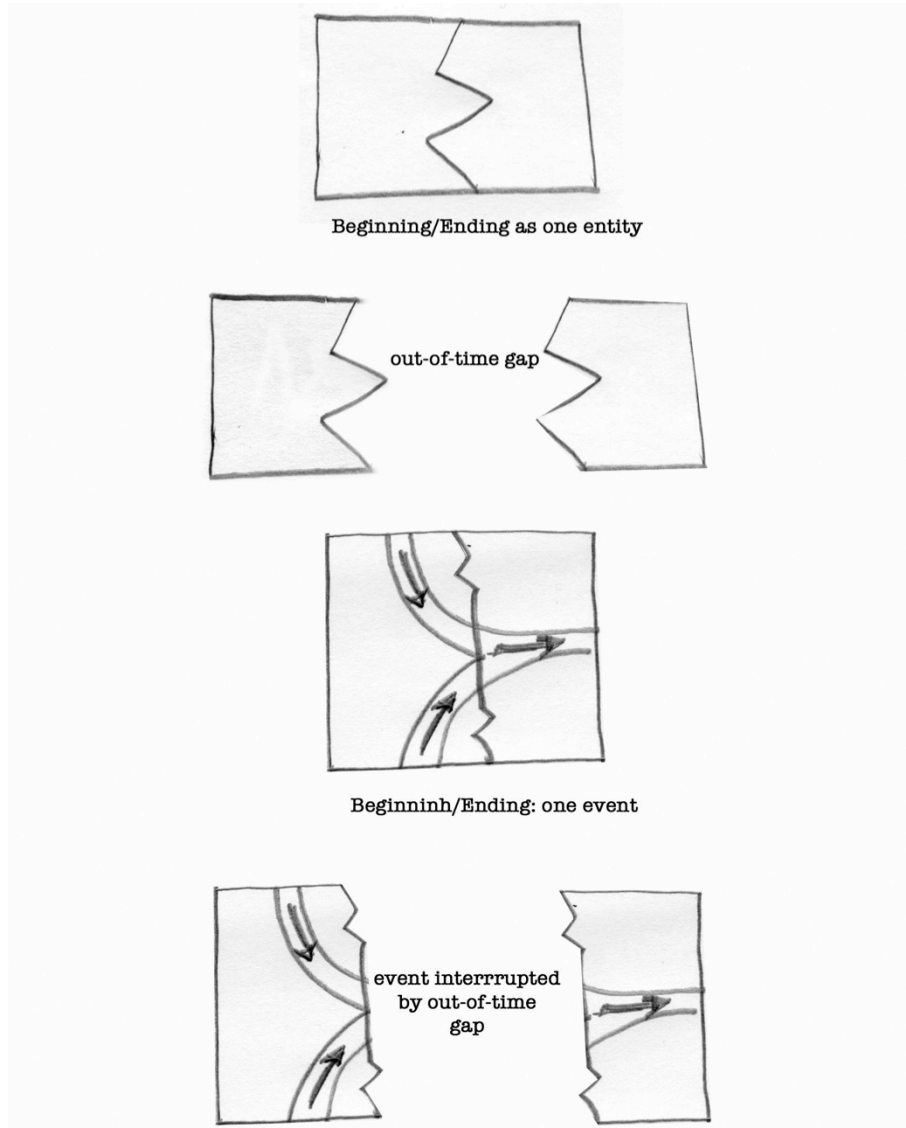
Time	1.Direction of time (order of events)	2.Speed of events; frequency; tempo	3.Duration of events
<p>1/Time is broken into separate unconnected interchangeable segments 2/Causal connections exist only within individual segments 3/ The passage of time doesn't change the space or the protagonist; it is traceless 4/ Time count is 'zeroed' at the beginning of each segment; within the segment, the time is limited; the time count precipitates events; 5/ all moments of time are governed by chance: a chance coincidence, a concurrence, a chance rapture, a chance temporal disparity.</p>	<p>1/ projections are arranged in short self-contained clusters /sequences (segments); 2/ the beginning and the concluding clusters are predetermined and fixed; other segments are incidental 3/ between the segments the installation returns to the initial state which remains unchanged to create the feeling of segments being interchangeable and inconsequential 4/ each cluster/sequence has clearly indicated time count 5/ procedural rules employed in shot selection emphasise coincidence</p>	<p>1/ speed of events remains constant throughout the piece 2/frequency of events empathises coincidence</p>	<p>1/ the duration of each time segment is limited by the number of shots; the initial and the final events of each time segment are predetermined and fixed; the actions of the interlocutor can shorten the duration of the time segment by changing how many events (up to the full number) take place between the initial and the concluding event of the segment 2/ the number of segments in each interaction is unlimited and determined by the actions of the interlocutor; however, the first and the concluding segments are predetermined and are the same in each interaction</p>

Structural properties of the chronotope are summarised in Table on Figure 7-16. The chronotopic properties of space and time are expressed through specific elements as shown in the tables on Figure 7-17 and Figure 7-18.

Defined as shown above, this chronotope prioritises time over space. The physical space of the installation remains foreign to the spaces represented in projections. Projections can appear anywhere in the installation space, which itself remains neutral and unchanged between events. Only the opening and the concluding segments are fixed in their relative place on the time-line of the interaction. Moreover, the beginning

'Chronovist' conceptualization method: exploring new approaches to structuring narrative in interactive and the ending are two parts of one entity, divided by an 'out-of-time gap' as described earlier (Figure 7-19).

Figure 7-19 Beginning and ending in Greek adventure novel chronotope.



This gap between the beginning and ending creates a powerful vector along which incidental segments appear by chance during the interaction. (Figure 7-20). The spatial movement of the interlocutor in the installation space from the entrance to the exit becomes the thread upon which the individual segments are arranged. The beginning event can be triggered by the interlocutor's entering the installation room, or by a marked position within the room itself; the ending event is always triggered by the spatial position of the interlocutor (logically within a certain predetermined distance from the exit door).

Figure 7-20 "Gravity force" between the two parts of the divided 'beginning/ending' event.

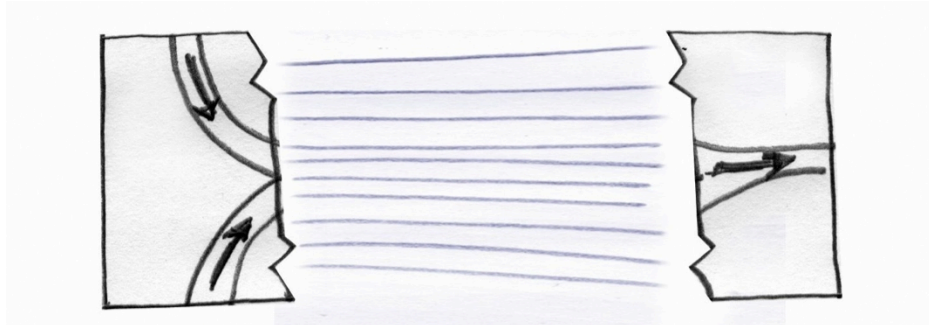
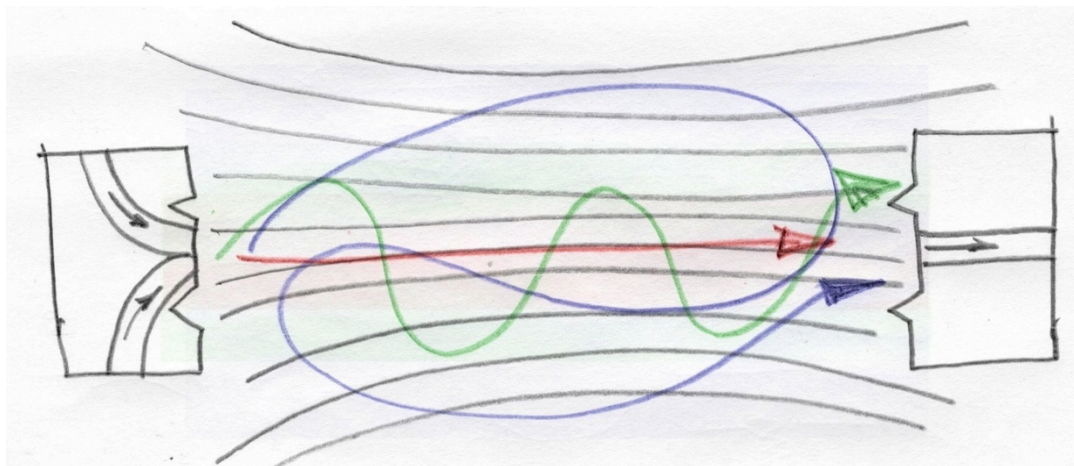


Figure 7-21. Possible movement of the interlocutor.

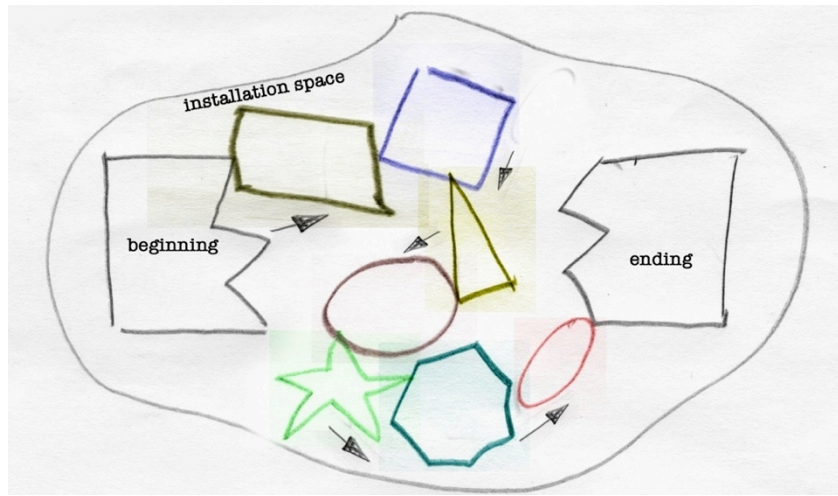


There are two options as to how individual segments can be distributed. The first option prioritises space: the appearance of each new segment is caused by the spatial movement of the interlocutor in the installation environment between the beginning and the ending segments, which, as stated earlier, are fixed in relative time and space.

The chronotope of Greek adventure novel, as demonstrated earlier, requires sudden, dramatic changes from one adventure to another, and therefore clear instantaneous transitions from one segment to the next one. Therefore, different segments cannot overlap; nor they can be separated by gaps (neutral areas of the installation environment) where their respective out-of-frame spaces could potentially blend.

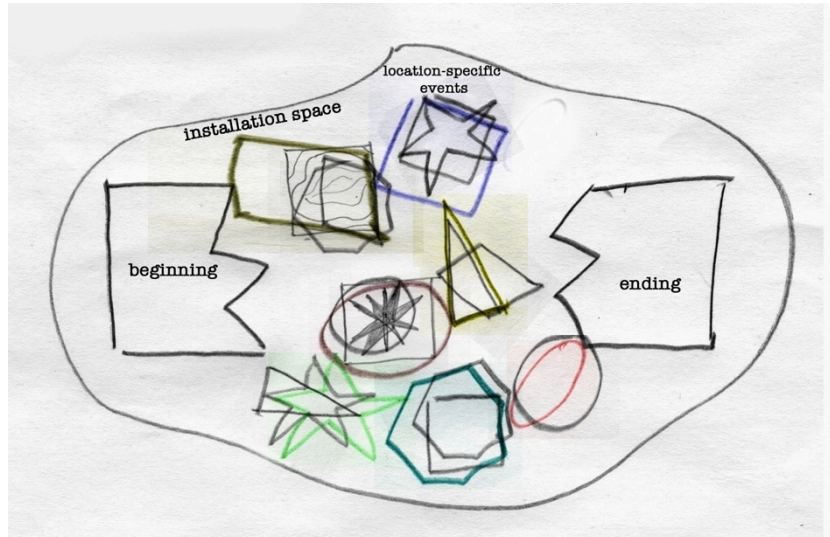
The drawing on Figure 7-22 illustrates an interlocutor's path in the installation environment, where different shapes represent different segments with their own spatial and temporal properties, and the boundaries of the distribution of these properties.

Figure 7-22. Priority of the spatial position. Segments revealed along a path of the interlocutor.



It is important to stress that in this structure multiple segments (events) can have the same spatial coordinates in the installation space (Figure 7-23). Which particular event is actualised can depend on three factors - the actions of the interlocutor, on the segments having been already actualised, and on the clock-time of the interaction.

Figure 7-23. Multiple events in the same vantage points.



Another option of structuring the fused space of Greek adventure novel chronotope and the installation space prioritises time. While the choice of a segment still depends on the actions of the interlocutor, the timing of it is governed by the clock-time of the interaction, regardless of the interlocutor's spatial position, except for the beginning and the ending segments.

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Figure 7-24 presents the temporal distribution of segments between the 'beginning' and the 'ending'. Figure 7-25 shows how these segments are distributed in the installation space. In this option, the location of the interlocutor is irrelevant; any event can be actualised at any vantage point, and which one is actualised is determined by the actions of the interlocutor, the history of the interaction (preceding segments) and the absolute 'time-stamp' of the interaction.

Figure 7-24. Temporal distribution of events along time vector.

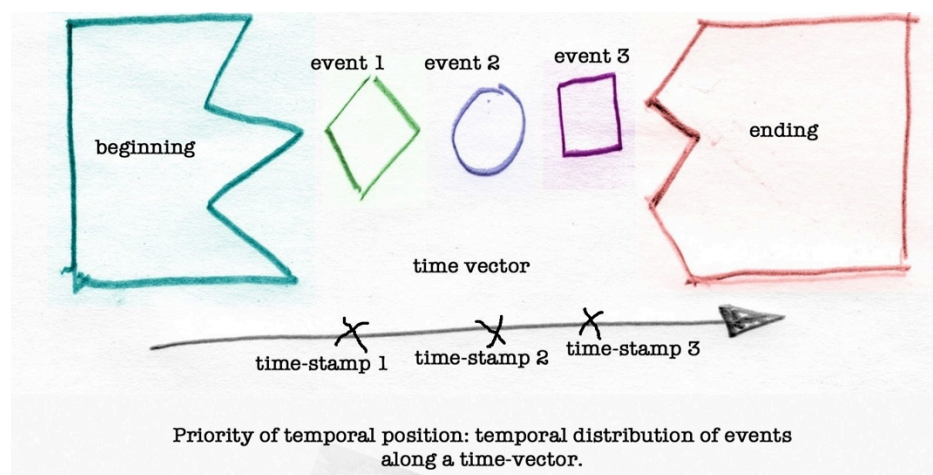
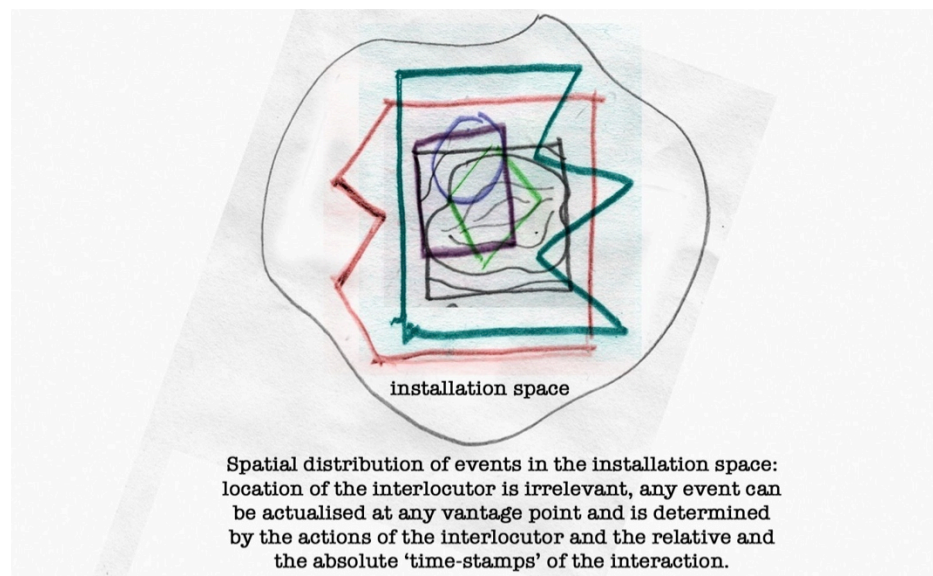


Figure 7-25. Spatial distribution of events in the installation space.



Once the structure of the piece has been decided upon, the author can chose the narrative material to be used. According to the summary of the Greek adventure novel as given by Bakhtin, the beginning is a meeting of the protagonists and the ending is their wedding. The 'out-of-time gap' is filled with various adventures – for example, an

'Chronovist' conceptualization method: exploring new approaches to structuring narrative in interactive escape, a tempest, an entrapment, meeting a double, etc. The interlocutor must be given a role that would allow engagement and immersion – for example, if the piece is designed as an account of events told and shown by one of the protagonists, the interlocutor can be the addressee of this narration. Transitions between the various parts (segments) of the account will be triggered by either the location of the interlocutor (option one), or the time of the interaction (option two). Each individual segment will have specific spatio-temporal continuity (situational chronotope). Based on the specified properties that define each situational chronotope - for example, the shape and penetrability for the 'obstacle', escapability for the 'mistake/trap', the border position for the 'mirror' and so on. The isovist of each segment can be calculated and used to design the distribution, movement, size and context of video and audio projections in the installation space. The created specific spatio-temporal continuities can be subjectively experienced by the interlocutor.

7.3 Conclusion.

In this chapter I have shown how the proposed method could be used as conceptualisation tool, providing the author with structural framework from the inception of the idea to production planning. The next chapter will summarise the method, and suggest how the proposed conceptualisation approach can be adapted according to the author's needs.

8. Chapter 8. Application of the method to media outside interactive immersive cinema and possible future developments.

8-1. Film.

Two projects undertaken during the process of this research informed it and shaped its outcomes. The first project was a concept for an interactive audio-visual piece 'Pionerka', which first started as a script written in Inform 7 as an executable Interactive Fiction text, and which was later developed into an installation concept, which I discussed in detail in Chapter 7.

The second project was a feature film *Dog's Paradise*⁶² (Russia, 2013), which I completed as a director during the last two years of the research. The 'chronovist' method was first developed as a conceptualisation tool for interactive immersive audio-visual media; however, I used this methodology to create a non-interactive drama film, testing how this approach could be extended to another medium.

Dog's Paradise is a 116-minute movie made for theatrical release based on a pre-existing script by Alexander Adabashyan (written in 2002 and published in 2008⁶³). I developed the film employing the described 'chronovist' approach at the same time sketching how it could be transformed into an interactive immersive cinema piece. In developing the concept for an interactive version I used the structure of my 'Pionerka' piece as it had very similar chronotopic design.

Authorship

The film was conceived and executed as 'film d'auteur' (as first defined by François Truffaut)⁶⁴. Being not only the director but also a co-producer and having raised the majority funding for the production, I had creative control limited only by budgetary and production restrictions. I will analyse the film as a text created by an author (myself) and will discuss authorship decisions made during the development and

⁶² The illustrations used in this chapter are stills from the film and production sketches made in collaboration with production designers Anastasya Karimulina and Alexander Adabashyan. The full list of credits is available from: http://www.imdb.com/title/tt2819266/?ref_=fn_al_tt_1

⁶³ Adabashyan, A. 2008. Proezd Serova, *Iskusstvo Kino*, 2008 (10), pp. 67-115

⁶⁴ Thompson, 2010, p 381-383; Truffaut, 1954.

'Chronovist' conceptualization method: exploring new approaches to structuring narrative in interactive production of the film. I refer to the decisions made solely by myself as 'mine' and to the decisions made in collaboration with other crew members under my leadership as 'ours'.

8.1.1. A short outline of the project.

The synopsis of the story.

The story is set in Moscow in the summer of 1953, and takes place in the courtyard of a large apartment building. One morning, Tanya, an eleven-year old girl living there, meets a boy, Mitya. Mitya and his family have just returned from exile in the Russian Far East, and have moved into the same building. Tanya learns that Mitya has left behind his best friend, a wonderful dog called Hector. Mitya is eager for Hector to join him in Moscow, but the adults declare it impossible – a large city is no place for a dog. Tanya has her own reasons for wanting the dog to come. Outside the yard, where children are not allowed to go by themselves, there is a café for 'children with dogs only'. Tanya imagines all kinds of delicious things there – sweets for children, bones for dogs... If only they had a dog, they would finally be allowed to leave the yard and visit this amazing café... In an attempt to prove the adults wrong and convince them to bring over Hector, Mitya and Tanya decide to create the perfect home for him – a dog's paradise in an empty sealed room they find in the building. In order to furnish Hector's new home, the children borrow things they think their neighbours won't miss. They take only junk, but each disappearing object turns out subsequently to be of enormous value to its owners. An old thermos flask is an artefact of the Chinese Cultural Revolution, a wooden box is a military relic, and a tiger skin turns out to have been a gift from a heroine of the Spanish Civil War...

During their adventures, Tanya discovers more and more about Mitya's family – things that even Mitya himself doesn't know: why they were sent to exile, why they stubbornly insist on celebrating the New Year in the middle of the summer, and how Mitya became an "orphan" with his parents still alive. She says nothing to Mitya. She knows that the truth can be hurtful, and that sometimes lies are necessary to protect a person. Tanya has grown up quickly, but while her childhood is coming to an end, Mitya's is still in full swing, as he prepares for the arrival of Hector, who – as Tanya has learned – has in fact died of grief after the boy's departure. Again, she tells Mitya

'Chronovist' conceptualization method: exploring new approaches to structuring narrative in interactive nothing. The dog's paradise is ready, but Tanya has to leave. Her parents are sent to work abroad and she is placed in a boarding school. Mitya runs after the car as it drives Tanya away into the distance. Unaware of Hector's death, he promises that when the dog arrives, together they will find Tanya.

8.1.2. Themes and chronotopes.

While the script was originally written by the author in an objective third-person manner, I decided to tell the story as the childhood memory of a grown-up narrator, in first-person and to concentrate only on what an eleven-year old child would notice, understand and remember from that time. Upon analysing the script, I identified the following chronotopes as the ones that would define the film:

1/ chronotope of the 'Soviet 1950s';

2/ chronotope of 'remembered childhood';

8.1.2.1. Chronotope of the 'Soviet 1950s'.

a/ Background research.

During the pre-production stage, I undertook extensive historic research into various aspects of life in the Soviet 1950s. The life of ordinary people in the Soviet Union of that time was poor in terms of material wealth compared with Western countries, and many commodities were still missing. However, historical evidence assembled during the pre-production – memoirs, diaries, photos, private correspondence, archive footage, newspaper articles and recordings of radio programmes as well as research interviews conducted with people who have first-hand experience of that time⁶⁵, suggested that it was a happy society where life visibly improved year by year following the Second World War. The Second World war ended and those who survived returned to their families; private life reverted to normality; cities, towns and villages were rebuilt and expanded with new, glorious 'Stalin empire' architecture and apartment buildings with rooms and flats for ordinary citizens; commodity and food prices came down every year on January 1; the prospects of 'this generation of people living in a Communist society' were considered reality, not utopia. The underlying tone

⁶⁵ The research was conducted in Russian.

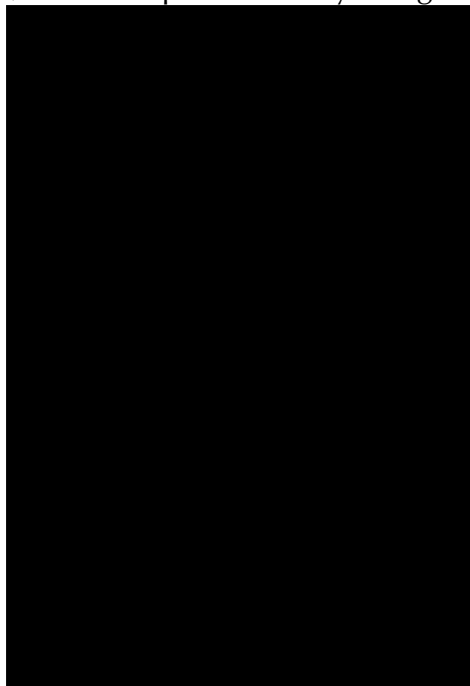
'Chronovist' conceptualization method: exploring new approaches to structuring narrative in interactive of everything I found in the materials I assembled was one of profound social optimism.

b/ Visual references.

As the main visual references, I chose the Soviet Fine Art of 1940-1950⁶⁶. I treated fine art from that time as visual 'snapshots' of the chronotope I sought to create. Works by Laktionov⁶⁷, Yablonskaya,⁶⁸ Reshetnikov⁶⁹ and other artists depicted a joyful world full of sunlight, the world where it never rained. In that world people read books, studied, practiced music and visited friends. Children played together outside in a safe and comfortable environment, while adults were building cities, moving into new flats and starting happy idealistic relationships. This world, pictured in the Soviet paintings from 1950s, did not have hidden fears, dark corners, dangers or threats.

Figure 8-1. Alexander Laktionov. *A letter from the frontline*, 1947. Tretyakov Gallery, Moscow, Russia.

(Source: http://www.tretyakovgallery.ru/ru/collection/_show/image/id/2352)



⁶⁶ There is a regrettable lack of literature in English on Soviet Fine Art from 1945 to 1956 (from the end of the Second World War to the beginning of Khrushchev's 'Thaw').

⁶⁷ http://www.tretyakovgallery.ru/en/collection/_show/author/_id/347 [Accessed 15 August 2014]

⁶⁸ http://www.tretyakovgallery.ru/en/collection/_show/image/_id/2616 [Accessed 15 August 2014]

⁶⁹ http://www.tretyakovgallery.ru/en/collection/_show/image/_id/2223 [Accessed 16 August 2014]

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Other visual references were provided by Soviet fiction films made in 1949-1953⁷⁰. These films are equally idealistic, straightforward in their portrayal of human nature, showing that anything - any sin or misfortune - can be cured by a loving and caring society. Spaces in these films are full of air, contain very few objects, and both nature and the human-created cities and villages are equally beautiful. Besides having historical relevance, these qualities seemed also to be relevant to the chronotope of childhood - the second important chronotope of the film, which I will discuss later.

c/ Time and space.

The table on Figure 8-2 summarises spatial, temporal and plot-producing features of the chronotope of the Soviet 1950s as I defined them for the purpose of the film.

Figure 8-2. The chronotope of 'the Soviet 1950s'.

1.INTENDED NARRATIVE/ CONCEPT OF THE PIECE	2.OVERLY ING AND SITUATIO NAL CHRONO TOPES .	3.1 HOW THE SPACE AND TIME ARE STRUCTURED AND ALTERED (structural details)	3.2 OBJECTS AND CHARACTERS ARE INHERENT TO THIS CHRONOTOPE	4. THE CLUSTERS OF STORIES/ PLOTS (POTENTIAL CONFLICTS).	5. POV
To encapsulate the emotional, sensory and spatio-temporal experience of the life in the 1950s in the Soviet Union from the point of view of a 11-year old girl, whose understanding of people and events depends as the story unfolds.	1. Chronotope of the Soviet 1950	TIME: LINEAR TEMPORALITY linear structure with strong vector from the past to the future SPACE: RESTRICTED SPATIALITY empty waste spaces almost barren of objects. INSIDE-OUTSIDE DIHPTOMY 1/ presence of an unobtainable and unreachable (but observable) 'OUTSIDE'. 2/ time 'outside' is still – eternity time 3/ the space outside is unrestricted, infinite and crowded with objects.	OBJECTS: Several key objects reflecting social and historic realities of the time and the story of each character: CHARACTERS: 1/ Recent war as something all characters have in common. 2/ Communal living; neighbours in a apartment building live like an extended family 3/ fear of social punishment	1/ conflict between the desire for immediate happy future and the future which doesn't fulfil the expectations VECTOR FORWARD WITH PERMANENTLY EVADING DESTINATION 2/conflict between the interlocutor's DESIRE TO MOVE somewhere and the RESTRICTED PRESCRIBED SPATIALITY of the chronotope.	"Remembering insider' - the narrator is one of the people from that time remembering what happened many years later

⁷⁰ There is similar lack of literature available in English about Soviet cinema of 1940-mid 1950s, partially due to the Cold War and the Iron Curtain, partly to the fact that this period is overshadowed by the subsequent Khrushchev's 'Thaw' and the arrival of a new generation of film directors (Chukhrai, Khutziev, Tarkovsky, Konchalovsky, Mikhalkov) in the 1960s and 1970s. A rather incomplete list of films made during that period can be found on http://en.wikipedia.org/wiki/List_of_Soviet_films [Accessed 16 June 2014].

‘Chronovist’ conceptualization method: exploring new approaches to structuring narrative in interactive

8.1.2.2. Chronotope of ‘remembered childhood’

I used the structure of the chronotope of childhood developed earlier in this research, adapted it to reflect the ‘remembered’ quality and applied it to the cinematic narrative. The table on Figure 8-3 summarises features of ‘remembered childhood’ chronotope as I defined them for the purpose of the film.

Figure 8-3. The ‘remembered childhood’ chronotope.

1. INTENDED NARRATIVE/ CONCEPT OF THE PIECE	2. OVERLYING AND SITUATIONAL CHRONOTOPES .	3.1 HOW THE SPACE AND TIME ARE STRUCTURED AND ALTERED (structural details)	3.2 OBJECTS AND CHARACTERS ARE INHERENT TO THIS CHRONOTOPE	4. THE CLUSTERS OF STORIES/ PLOTS (POTENTIAL CONFLICTS).	5. POV
	2. Chronotope of ‘Remembered childhood’ (overlying)	<p>SPACE: 1/ EXAGGERATED PERSPECTIVE: centred on the interlocutor;</p> <p>2/ TWO WORLDS – children’s and grown-ups’ overlaying each other;</p> <p>3/ spatiality is selective and is characterised by the (temporal) EXPANSION IN SCOPE while CONTRACTING IN SCALE.</p> <p>TIME: temporality alternates between STILLNESS and SUDDEN THRUSTS</p>	<p>OBJECTS: Objects as story- and plot-carriers, used in unusual ways.</p> <p>CHARACTERS: 1/ PROTAGONIST (A CHILD) 2/ PARENTS (absent) 3/ FRIEND 4/ an absent friend – DOG 6/ Others - grown-ups (NEIGHBOURS).</p>	<p>CONFLICTS/ PLOTS 1/ conflict between DESIRES and IMPOSED RESTRICTIONS; 2/ conflict between the real function of objects and their existence in children’s world.</p>	<p>FIRST PERSON Child’s perspective as remembered by the narrator;</p> <p>1/ the SIZE of the objects in space CHANGES accordingly to the child’s growing up;</p> <p>2/ there are LIMITATIONS, RULES AND RESTRICTIONS the child should obey; disobedience is punished 3/ nothing is assumed as known unless the interlocutor has already encountered it in the piece; new things are taught and explained to the ‘child’; the protagonist accumulates knowledge about the world as the piece progresses.</p>

It was important to find the right degree of generalization of historic details, architecture and props, and to maintain the subjectivity of the point of view.

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8.1.3. Rendering of the chronotopes

Here I am providing a summary of production decisions made in order to render the two chronotopes described above.

8.1.3.1 Set concept: *inside/outside dichotomy.*

To combine efficiently the two chronotopes, I constrained the environment to a courtyard of a big apartment building, reflecting the limited accessibility of the outside world for the child, as well as the enclosed, separated nature of life in the Soviet Union behind the 'iron curtain'.

I treated the set as "an installation space", a kind of a 'time-machine', transporting everyone who entered it into his or her own childhood - with bright colours, permanently sunny weather, grotesque adults and secret shelters.

The pavilion where we built the sets was only seven and a half meters high, which presented significant difficulty for lighting and camera angles. I accepted the constraint and decided to turn it to our advantage by using this relatively small height of the space as one of dramatic elements, which worked on the chronotope of the childhood.

Figure 8-4. Plan of the set for *Dog's Paradise* showing the outlay (by A. Tchernakova, A. Adabashyan and A. Karimulina).

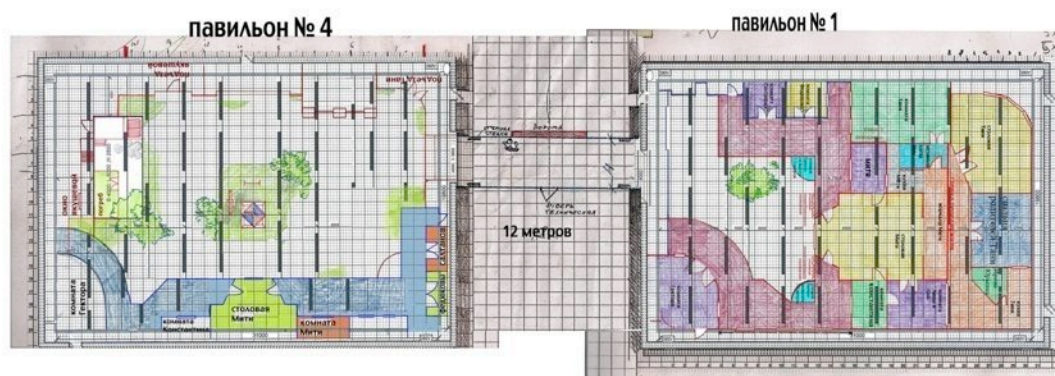
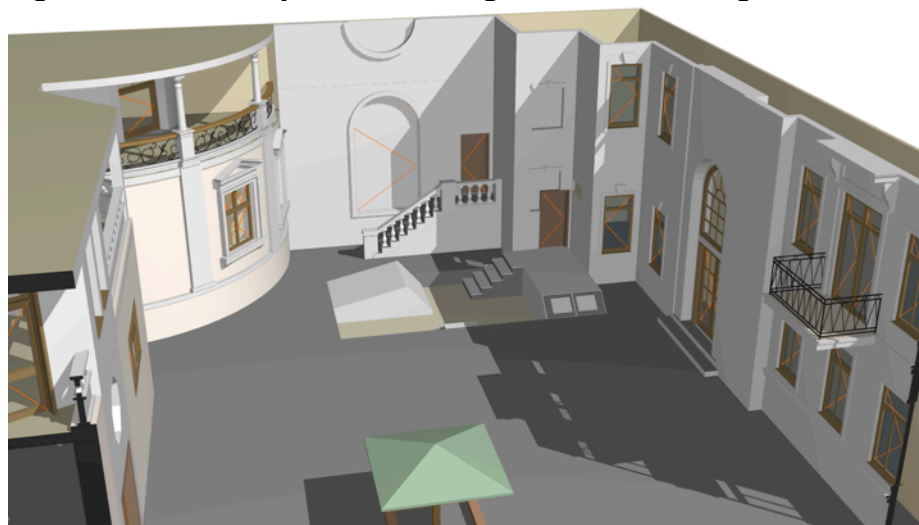
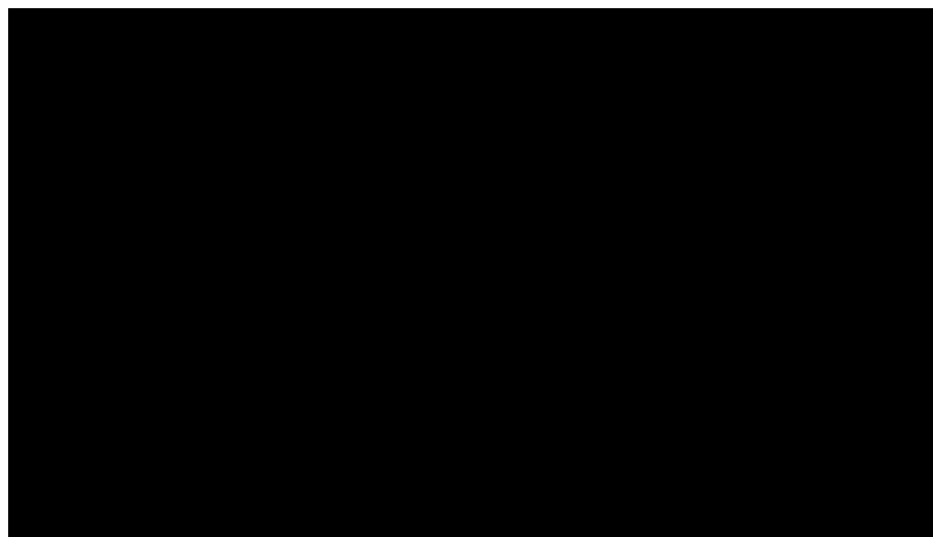


Figure 8-5. 3D computer rendering of the set for *Dog's Paradise*.



The courtyard was designed as a confined, “children-sized” environment with no exit or view to the outside except for the unreachable silhouettes of sky-scrapers with a neon sign saying ‘Dream’ seen in the crack between two buildings. The courtyard and the sign ‘Dream’ were used to express the in/out dichotomy of chronotopic structure identified earlier.

Figure 8-6. Screenshot from *Dog's Paradise*. The medium shot of the ‘Dream’ sign.



This unreachable “Dream’ is the café where the children want to go with the help of the dog. The ‘Dream’ world is shown four times in the film – three as the children’s imagination, and the fourth time in the ending, when Tanya is driven away, Mitya runs after her car and they are able, at last, to leave the courtyard, though not in the way they hoped for. The contrast between the image of a beautiful, huge, spacious dream

'Chronovist' conceptualization method: exploring new approaches to structuring narrative in interactive world on the backdrop and a small courtyard to where the children were confined, created the necessary emotional feeling of the closed little world of Tanya and Mitya.

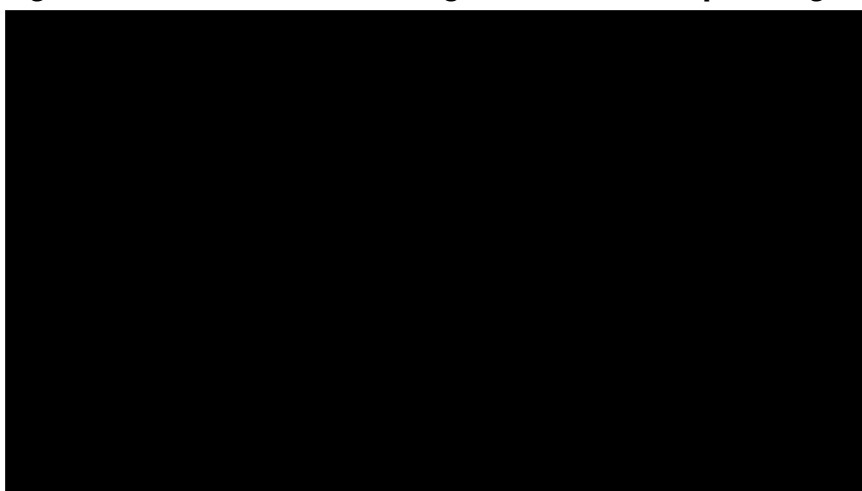
Figure 8-7. Screenshot from *Dog's Paradise*. The 'Dream' world.



8.1.3.2 Lighting.

To reflect the timelessness and the 'memory-like' static nature of the chronotope of childhood the lighting simulated an infinitely long sunny day for daytime scenes and bright cloudless moonlit night for night scenes. Because of the degree of subjectivity and artificiality required for the story, the logic of realistically justified 'sources of light' was ignored; instead we employed light as required to create the right emotional atmosphere for each scene. For example, for the day scenes we used impressionist-like movement of light and shade, as if from the movement of the leaves of a huge tree, even though there was no such tree seen in the courtyard.

Figure 8-8. Screenshot from *Dog's Paradise*. Example of lighting effect.



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To achieve that we constructed huge frames with artificial leaves, attached to the ceiling and moved by several fans to create the desired effect (Figure 8-9).

Figure 8-9. Production photo showing the set with a lighting setup employing frames.



8.1.3.3. Spaces.

To express the characteristics of both overlaying chronotopes discussed earlier – the chronotope of remembered childhood and the chronotope of the Soviet 50s - the space where the story took place has been divided into three sub-spaces, each with its own special features, distinguished by the point of view of the protagonist, Tanya.

Each environment is a combination of the two dominating chronotopes, the chronotope of the Soviet 50s and the chronotope of remembered childhood, but at the same time possessing its own unique qualities. Each has been modelled using references from the Soviet fine art mentioned above but each has its distinct mood and atmosphere, which are conveyed through many elements from the scale and proportions to the colour scheme and the sound design.

It is not unusual to use visual references – paintings, photographs – when discussing and preparing the cinematographic rendering of a film. However, in this case it was used differently. It was not just a colour/lighting reference, but, as I mentioned earlier, it was used as a snapshot of the chronotope of the Soviet 1950s. I aimed to recreate not only the atmosphere, the colours and the lighting, but also the way space, characters, objects and their relationships were depicted in these paintings.

Figure 8-10. Alexander Laktionov. *Moving to a new flat*, 1952. Oil, canvas. Donetsk Fine Art Museum, Ukraine

Source:http://artpoisk.info/artist/laktionov_aleksandr_ivanovich_1910/pereezd_na_novuyu_kvartiru [Accessed 15 August 2014]

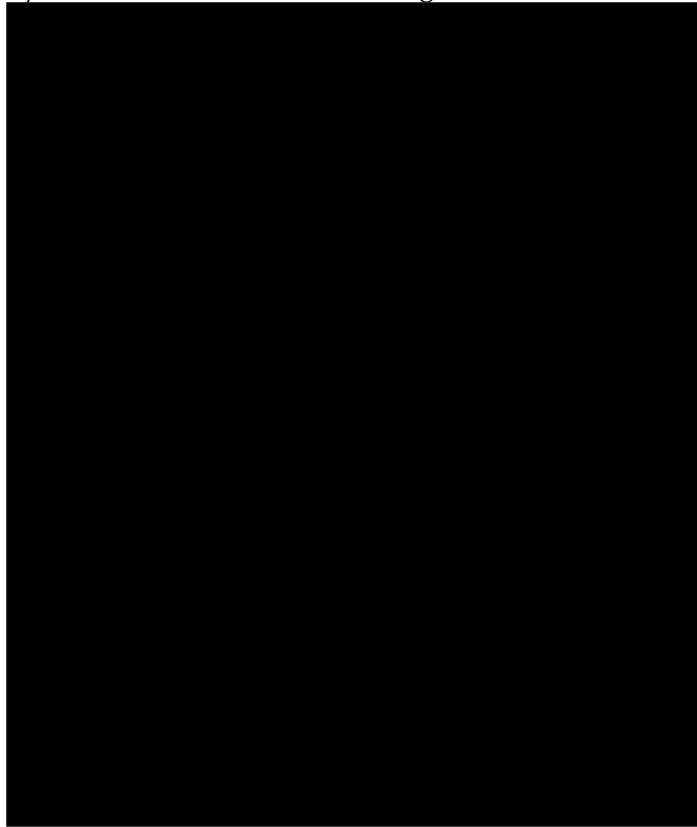
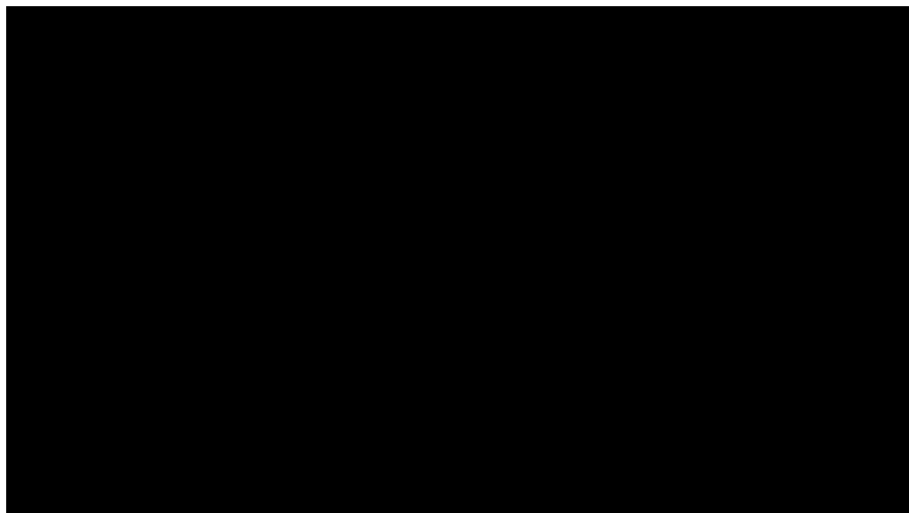


Figure 8-11. Screenshot from *Dog's Paradise*. Mitya's flat, living room.



The first distinct world is the world of grown-ups' (Mitya's flat, Konstantin's room, also the Fedyukovs' and Saltanov's rooms). There the spaces are small, painted in contrasting colours and filled with more objects than the very spacious Tanya's flat or the airy courtyard. The world of grown-ups is deliberately realistic, cluttered with

'Chronovist' conceptualization method: exploring new approaches to structuring narrative in interactive common, everyday noises, inundated with the sounds coming from the courtyard, voices, radio etc.

The second world is 'childhood'- the courtyard, the balcony and Hector's room. It has been conceived as a children-centred space and the incarnation of the memory of childhood. The space consisted of the sunny courtyard with a playground, an endless balcony to run along the building and to spy on grown-ups, and a secret room known to and accessible only by the children .

Figure 8-12. Tatyana Yablonskaya. *Spring*, 1950. Oil, canvas. The Russian State Museum, St. Peteresburg,

Source: http://artpoisk.info/artist/yablonskaya_tat_yana_nilovna_1917/vesna_080/, [Accessed 15 August 2014]

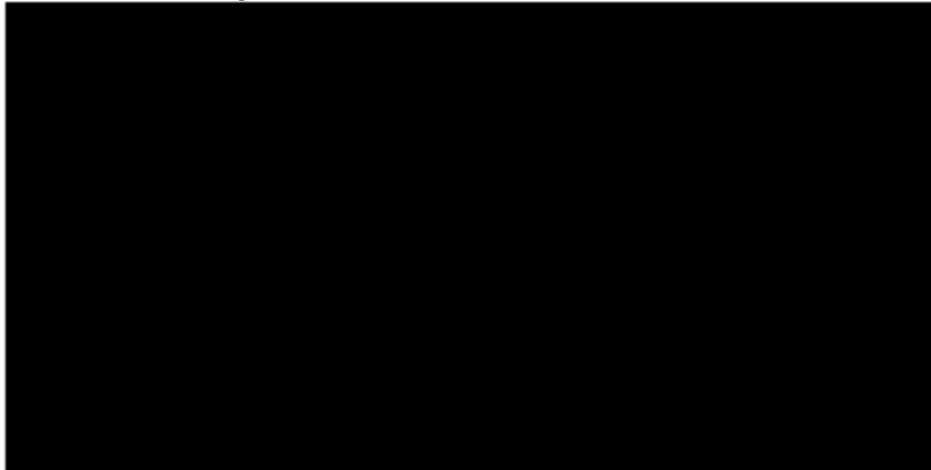
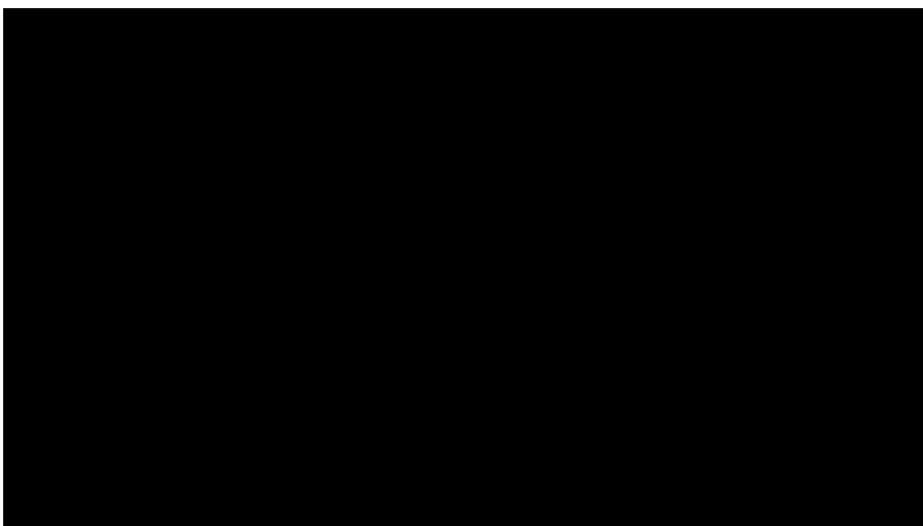


Figure 8-13. Screenshot from *Dog's Paradise*. Courtyard, the view towards the arch.



The 'childhood' world is deliberately subjective, full of unexpected sounds following the logic of a child's perception and interpretation rather than realistic 'truth'. For

'Chronovist' conceptualization method: exploring new approaches to structuring narrative in interactive example, each appearance of Konstantin, a Navy officer, is accompanied by seagulls' cries. Or when Saltanov, a wartime hero, types his memoir on a typewriter, the typing is accompanied by the sound of gunshots.

The third 'world' is Tanya's own flat, exaggeratedly big and official, with standardised furniture prescribed for such high-ranked Communist Party officials as her parents. Tanya's flat is a protected environment separated from the outside world, and does not have any sounds coming from the outside.

Figure 8-14. Screenshots from *Dog's Paradise*: Tanya's flat, corridor.

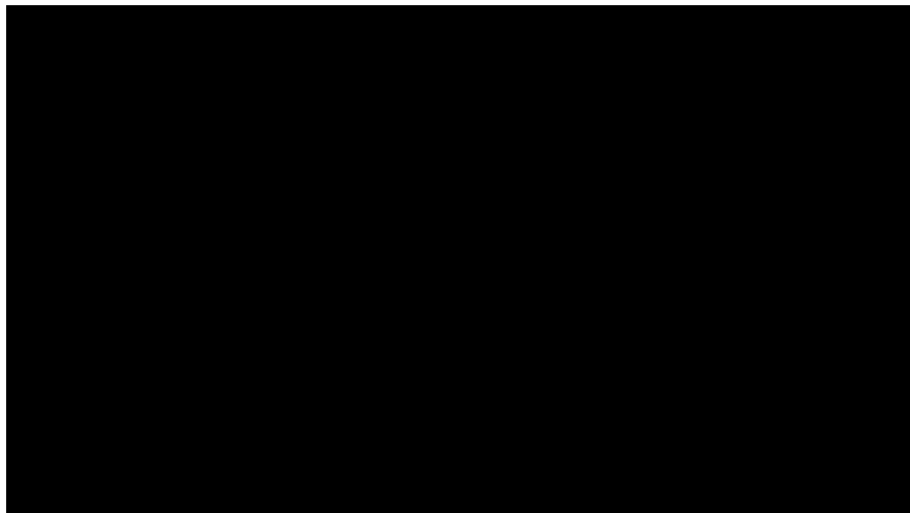
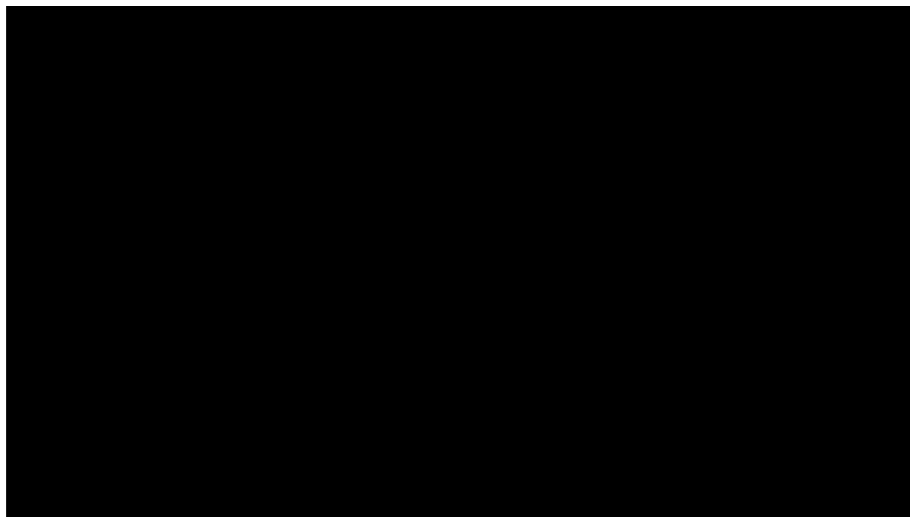


Figure 8-15. Screenshot from *Dog's Paradise*. Mitya's flat, corridor.



Compare, for example, the corridor in Tanya's apartment (Figure 8-14) and the corridor in Mitya's flat (which belongs to the 'grown-up world') (Figure 8-15). Mitya's corridor is small and crowded, the colours of the walls and the floor are dark, it is full of personal

'Chronovist' conceptualization method: exploring new approaches to structuring narrative in interactive possessions. Tanya's corridor is very big, with a very high ceiling, looks almost like a public library and has no personal belongings.

Figure 8-16. Tatyana Yablonskaya. *Morning*, 1954. Oil, canvas. Tretyakov Gallery, Russia



Figure 8-17. Alexander Adabashyan, *Set sketch for Tanya's bedroom*, 2012. Pencil, chalk, water-colours, paper. Private collection.

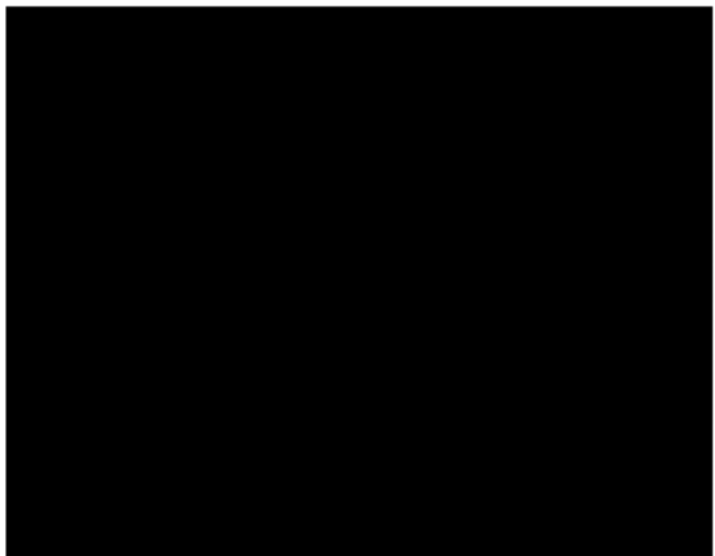
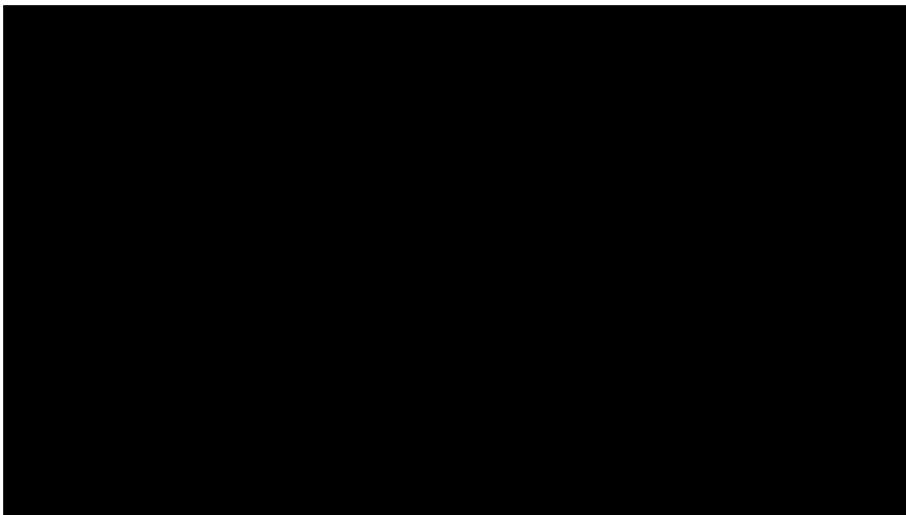


Figure 8-18. Screenshot from *Dog's Paradise*: Tanya's bedroom.



The only exception from the official look in Tanya's apartment is Tanya's own bedroom (Fig. 8-16, 8-17, 8-18). I deliberately modelled it on the painting by Tatyana Yablonskaya that was reproduced in all Soviet Grade One textbooks since the 1950s

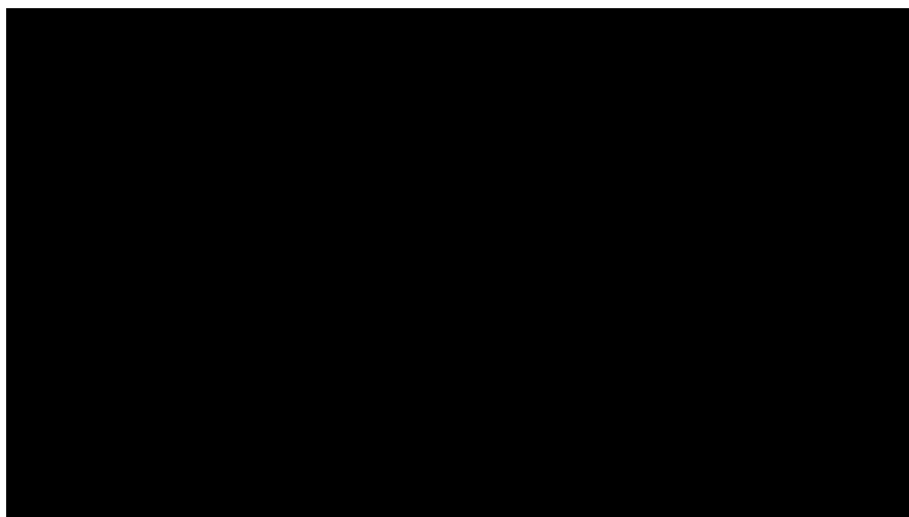
'Chronovist' conceptualization method: exploring new approaches to structuring narrative in interactive and firmly associated in the memory of many generations of Russian people with the image of 'happy childhood'.

8.1.3.4. Characters/Costumes.

Characters appearing in the story are those 'remembered' by the narrator, the grown-up Mitya. Except for Tanya, I treated them as plot-containing objects, each with its own story. The courtyard has the features of the chronotope of crossroad – it is impregnated with potential encounters with the inhabitants of the space, each encounter capable of producing its own narrative development.

Costumes of the characters executed by the costume designer Nadejda Vassilieva were planned as an important part of the environment design. Besides historical authenticity and artistic expression, the colours of the costumes were used to connect the character with the environment to which the character belonged. The colours of the costumes are harmonious to the colour of the rooms where characters live. However, these same colours look contrasting as soon as the characters find themselves in someone else's environment. It helps to connect the characters firmly to their secondary chronotopes, and provides a visual indication of how these chronotopes coexist and mix.

Figure 8-19. Screenshot from *Dog's Paradise*: Mitya's family in their environment, Konstantin (in white) is a stranger there.



For example, on Figure 8-19 we see Mitya's family in their living room. Konstantin, who is not a part of the family anymore is in white and separated from the environment. It is not her own space, and in the scene she is trying to transform it into

'Chronovist' conceptualization method: exploring new approaches to structuring narrative in interactive an environment she considers 'appropriate'. Her dark dress is in stark contrast with the colour of the walls and the colour of the dresses worn by her sister and her niece (left). Figure 8-20 shows several characters gathering in the courtyard, separated from their own environment.

Figure 8-20. Screenshot from *Dog's Paradise*: neighbours in the courtyard.



8.1.3.5 Objects (Props).

Objects were important elements helping to establish the described chronotopes. My intention was to avoid 'common-place' historical clutter. As with the characters I deliberately left out any accidental elements and employed only objects related to the story and acting as signifiers for the chronotopes.

The story had two distinct time slices – 1/ 1939 existing as a memory, which Mitya's family was trying to recreate, and 2/ 1953 which was when the story was taken place, therefore representing 'here and now' for both the characters and the viewers. 1953 was simultaneously a memory space for the main character who recalled the story from 2013, so the 'here and now' was already subjectively transformed by the narrator.

Objects related to the 'here and now' of 1953 needed to look deliberately new, just made and painted. Items related to 1939 and presented as old in the story needed to be old in a stressed, exaggerated way. The exaggerated nature of objects reflected the 'memory' aspect of the narrative.

In line with chronotopic nature of the piece each object appearing on screen contained its own story. Some stories were actualised in the film as the part of the plot,

'Chronovist' conceptualization method: exploring new approaches to structuring narrative in interactive and the objects became independent characters – for example, the Chinese thermos, the tiger skin, the small blue vial with perfume or Saltanov's wooden box.

Figure 8-21. Screenshot from *Dog's Paradise*. Chinese thermoses.

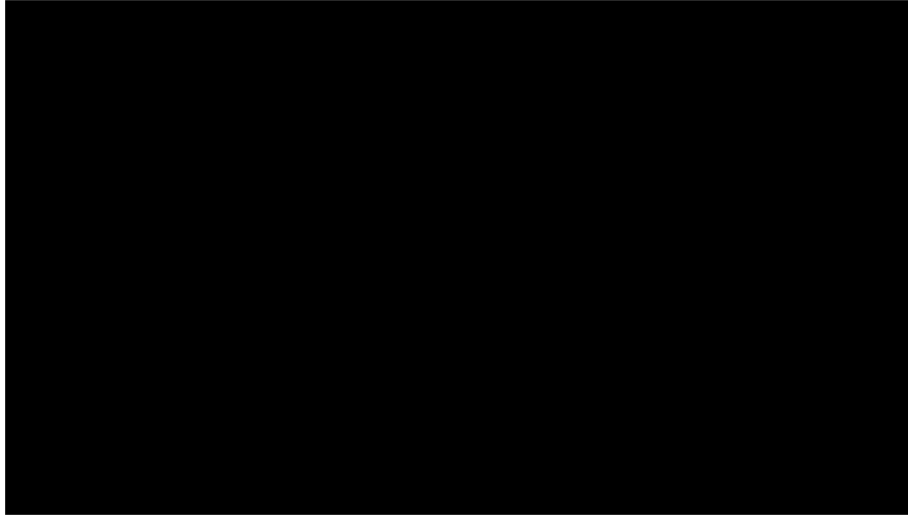
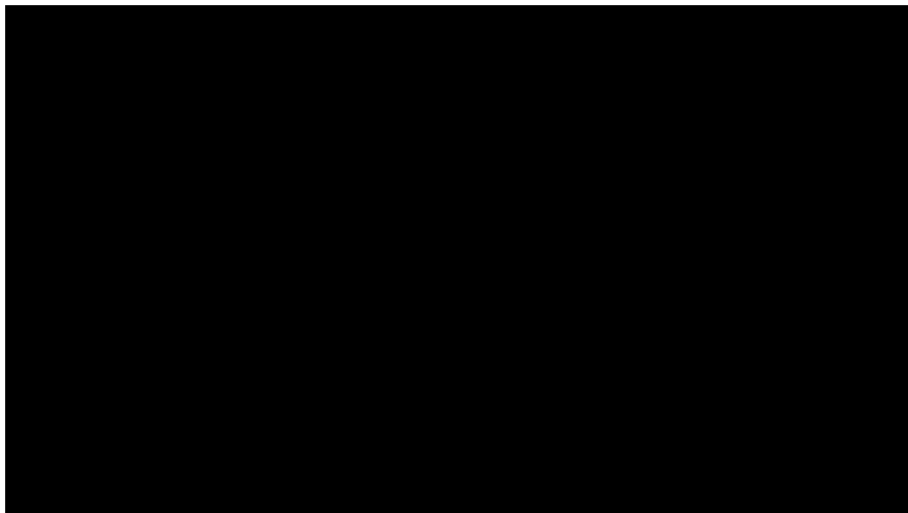


Figure 8-22. Screenshot from *Dog's Paradise*. The tiger skin.



Other objects provoked actions and plots, as happened with a set of pull-up bars we placed in the courtyard set. At the time it was a typical feature of every yard; in the film it became a focal point of many scenes influencing the mise-en-scène.⁷¹

⁷¹ To complete the transformation of the set into a courtyard of 1953, I arranged for recordings of radio programs of the time to be played when we were not filming or rehearsing. Every day I also provided a 'fresh' newspaper dated 1953. As the filming progressed, the set became more and more 'alive'. I witnessed how the chronotopic environment we created for the movie started conditioning the behaviour not only of actors, but of the crew as well. For example, actors and crew vividly discussed the news items from the 1953 newspapers. Children-actors existed separately from the grown-ups, inventing their own games in the set as if it were a real apartment building with a courtyard, and keeping a watchful eye on unsuspecting adults. I have already mentioned the pull-up bars attracting everyone and provoking improvised contests. During breaks it also provoked improvised contests between the crewmembers, as was the case in real courtyards in the 1950s.

Figure 8-23. Screenshots from *Dog's Paradise*: Mitya on pull-ups bar.



Figure 8-24. Screenshots from *Dog's Paradise*: Yakushev on pull-ups bar.

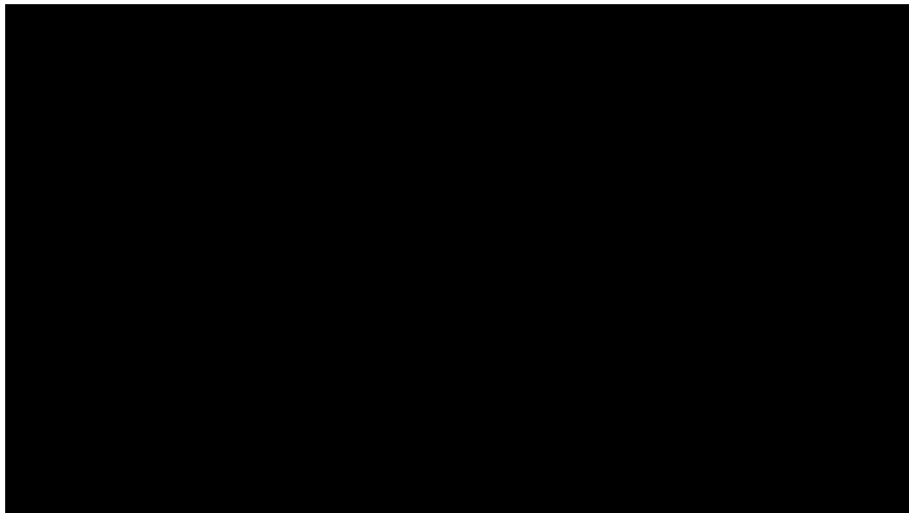


Figure 8-25. Screenshots from *Dog's Paradise*: Fedukova on pull-ups bar.

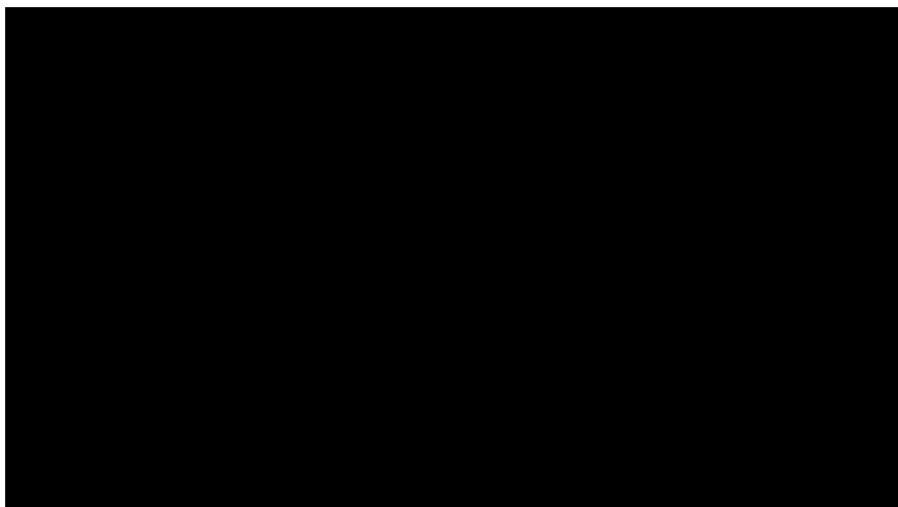
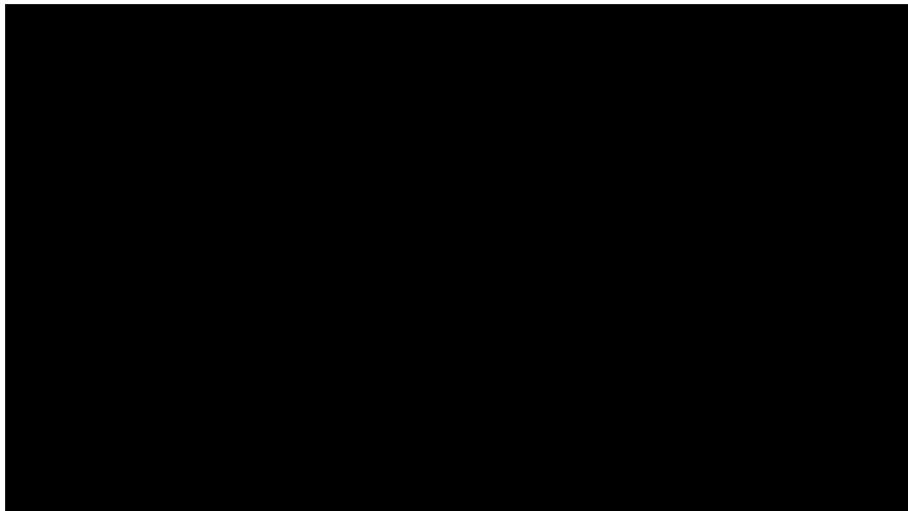


Figure 8-26. A photo from the set: crew during the break.



Other stories contained in objects remained in the background, to be unravelled only by a discerning viewer: for example, the complete sets of works by Lenin and Stalin, a collection of china dogs, a wooden propeller in Saltanov's room (Figure 8-27), or a plate from a pre-revolutionary dining set. These plot-containing objects could be used when transforming the film into an interactive immersive cinema piece.

Figure 8-27. Screenshot from *Dog's Paradise*: Saltanov's room with a wooden propeller, a map of wartime battles and gym rings in the background.



8.1.3.6. Point of view.

Almost everything that happens in the film is shown through the eyes of the protagonist, an eleven-year old Tanya. So it was important from the outset to establish the subjectivity of her point of view.

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One way was to employ formal methods like shooting through foreground objects and using uneven camera angles. Figure 8-28 shows the conversation between Elena and her daughter Katya from Tanya's point of view. Figure 8-29 shows the reverse shot of Tanya hiding in a box.

Figure 8-28. Screenshot from *Dog's Paradise*: Tanya's POV on Elena and Katya.

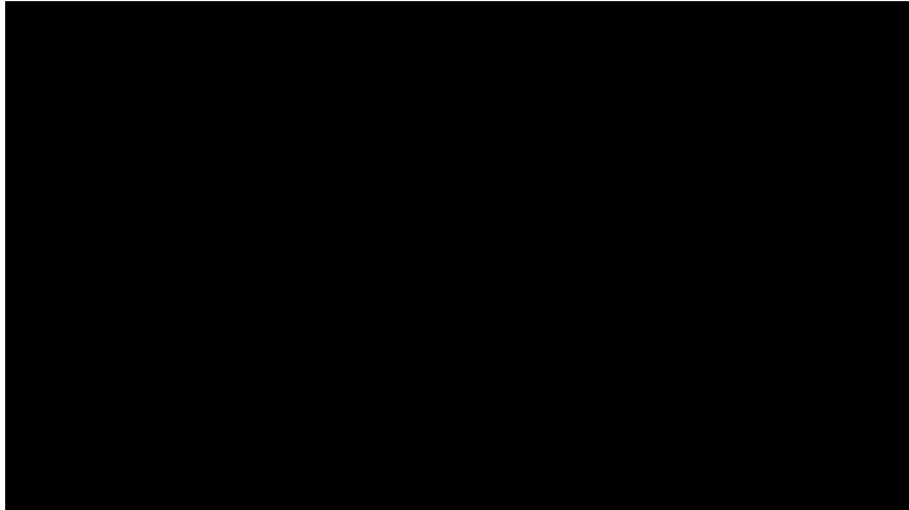
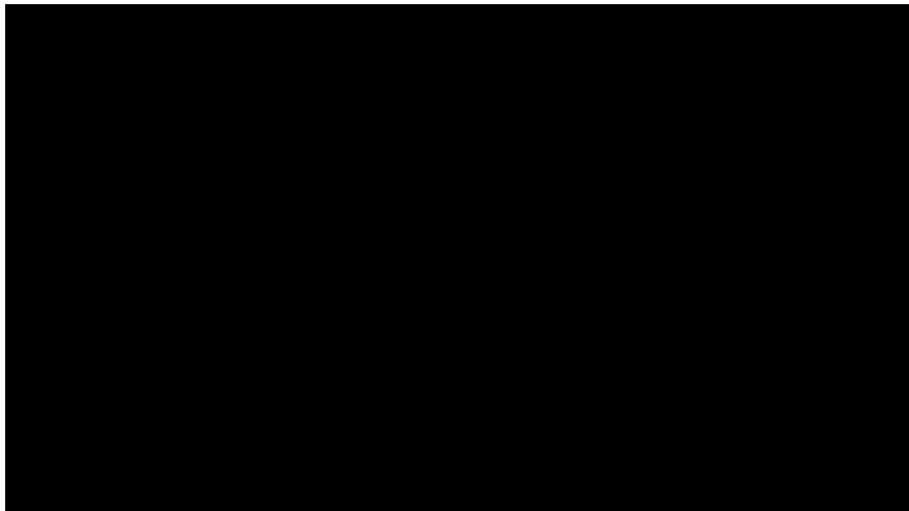


Figure 8-29. Screenshot from *Dog's Paradise*: the reverse shot of Tanya.



Another way was to focus on details and in every scene to follow the logic of the attention of a little girl (Tanya), rather than the content of the scene from a grown-up point of view, both in image and sound. If it were an interactive cinema piece, the viewer would have been in the position of Tanya, discovering the story and its world from her perception. The story is being unfolded using the 'chronotopic isovist' approach discussed in previous chapters'.

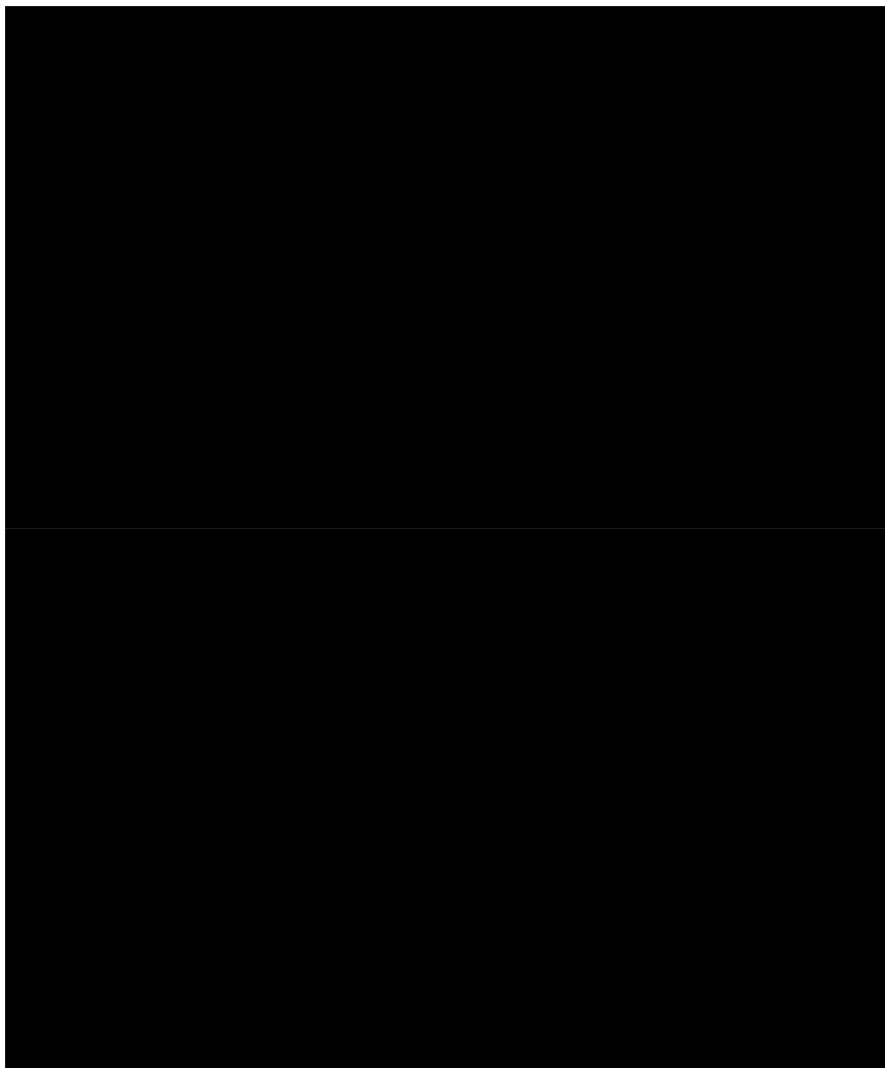
For example, in the episode where Mitya's grandmother Elena and her sister Olga approach for the first time the infectious subject of Konstantin's presence, Tanya, who

'Chronovist' conceptualization method: exploring new approaches to structuring narrative in interactive is witnessing their scene (Figure 8-30), looks at the Christmas tree decorations and carnival masks which are being simultaneously unpacked by the family.

Figure 8-30. Screenshot from *Dog's Paradise*: Tanya watching Lina.



Figure 8-31. Screenshots *Dog's Paradise*: Lina with the mask.



'Chronovist' conceptualization method: exploring new approaches to structuring narrative in interactive

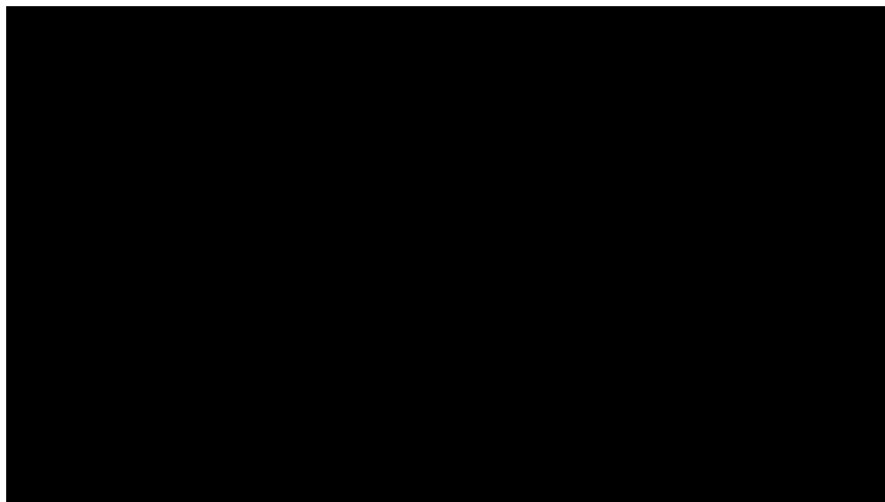
The camera, replicating Tanya's eyes, follows Olga's teenage daughter Lina who steps aside, towards a mirror, to try on the mask of a squirrel, seemingly oblivious to the content of the dialogue (Figure 8-31).

In a similar way, in many scenes throughout the film the camera follows the visual trajectory of Tanya's attention, sometimes leaving much of the dialogue behind the frame.

8.1.3.7. Temporal structure.

The temporal structure of the story in the film – that of a retold memory - has a circular, repeating structure. Starting with the recollection of events in a voice-over by a grown-up character and the close-ups of himself as a boy and his friend Tanya, it moved in a free but linear way from event to event, culminating in Tanya's departure. However, the final song and Mitya's return to the courtyard opens the possibility for other replays of the same story. The memory and the characters are forever stored together with the cardboard set, a dollhouse to be played with by Mitya's memory again and again. Figures 8-32, 8-33, 8-34, 8-35 and 8-36 show the rhyming images, which open and conclude the film.

Figure 8-32. Screenshot from *Dog's Paradise*: first shot of the film - a cardboard model of the yard.



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Figure 8-33. Screenshot from *Dog's Paradise*: arrival. The cardboard courtyard has become a real space.

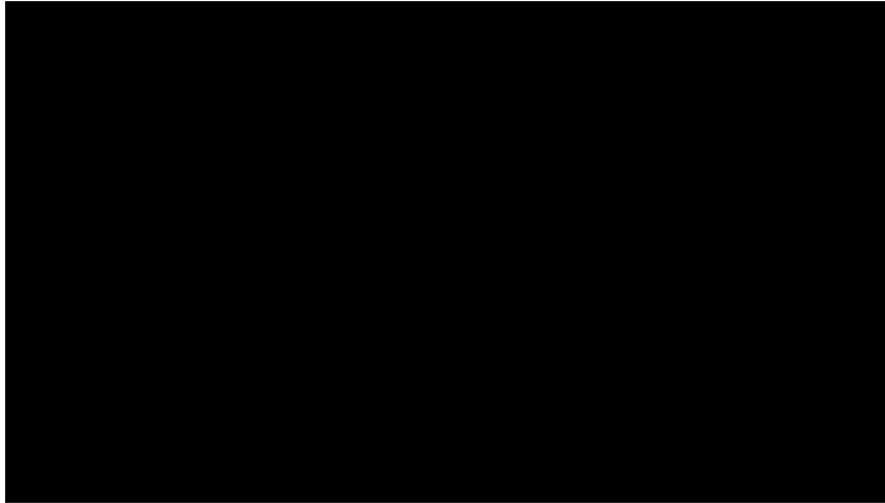


Figure 8-34. Screenshot from *Dog's Paradise*: first appearance of Mitya - a close-up.

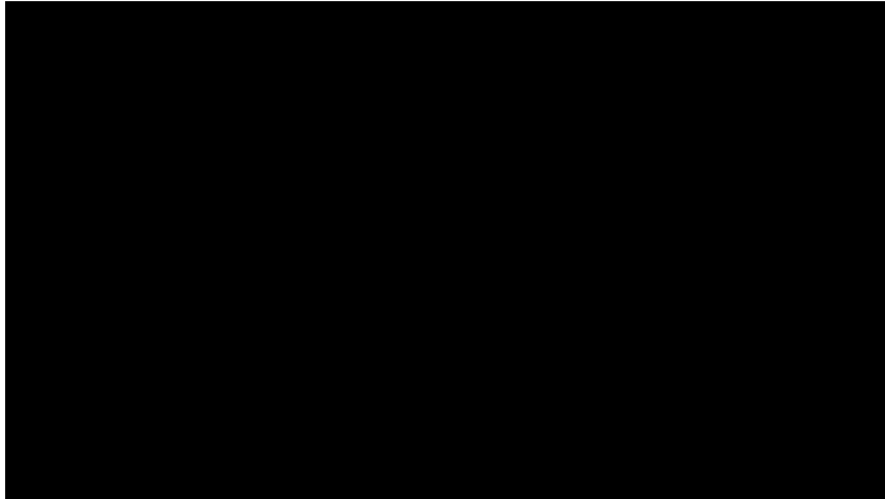


Figure 8-35. Screenshot from *Dog's Paradise*: ending – Mitya in the courtyard.

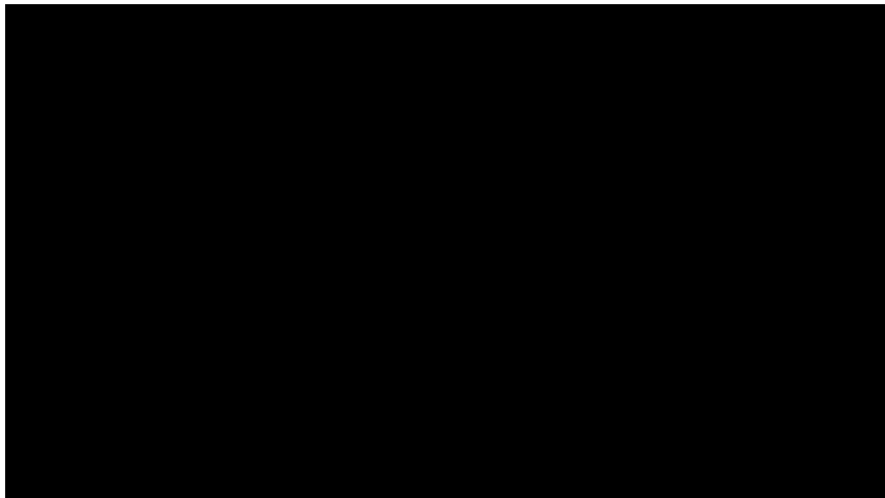


Figure 8-36. Screenshot from *Dog's Paradise*: ending – close-up of Mitya, the last frame of the film.



8.2 Dog's Paradise Remixed.

Dog's Paradise is a feature film with an open yet precisely defined chronotopic structure with clear tempo-spatial coordinates, built with the help of the chronotopic isovist framework suggested in this research. It was conceived so that it can be developed into an interactive immersive cinema piece. The existing film is in fact a recording of one of the possible 'walks-through'. I will describe a possible structure for such an interactive immersive piece.

For an interactive immersive audio-visual narrative a layered temporal structure described in Chapter 7 can be employed. The interlocutor can be given the role of the narrator/protagonist, discovering the past at the depth of his memory. The interface can be based on the spatial coordinates and the movements of the interlocutor, including hand gestures.

The space of the installation can be invisibly divided into three bordering, sometimes overlapping but separate worlds, mentioned earlier – the childhood world, the world of grown-ups and Tanya's world.

The three 'time slices' mentioned earlier (1939, 1953 and the 'nowadays') can be overlaid one over another in the same installation space, independently from the spatial division.

Each time slice can be triggered by (the sound or the projections of) plot-inducing objects or characters discovered by the interlocutor in the process of exploration. The

'Chronovist' conceptualization method: exploring new approaches to structuring narrative in interactive interlocutor would be able to 'bring the memories closer' by magnifying the size of the projection, or to reject the memory by making the projection smaller, or even turning it off.

Once two or more objects or characters from the same 'time-slice' have been uncovered by the interlocutor and magnified, a 'memory' of their interaction is uncovered as a looped scene projected in the 'nowadays' part of the installation. If the 'memory' is subsequently rejected it would turn off not just the projection of the object, but the scene as well. The more memories have been discovered and the fewer have been rejected, the fuller becomes the space. The 'memories' can be given different significance so that some can be rejected without consequences, but rejecting a significant memory would make other projections of objects or characters go away as well.

The voice of the narrator would comment on discovered objects and characters, providing a subjective interpretation of events.

The exploration can have an ending triggered by one of the discovered memories, for example, the departing Tanya.

8.3. Conclusion.

The 'chronovist' framework has been developed as a conceptualisation tool for interactive immersive cinema. However, as I have showed it can also be used for a variety of audio-visual applications, including creating conventional fiction films.

In this chapter I have showed how the suggested 'chronovist' conceptualisation tool was used for the creation of an audio-visual text, in the example a feature film 'Dog's Paradise', with the potential of being developed into an interactive immersive cinema piece.

The real-life application of the framework shows its flexibility and independence from technical means and suggests a great diversity of possible applications ranging from innovative borderline narrative video games like the games by David Cage discussed in Chapter 1 to feature films, as demonstrated in this chapter.

9. Chapter 9. The Conclusion.

9.1 The summary of the concept.

For the purpose of this research I have imagined chronotope - a spatio-temporal continuum with the network of axes and powers (as has been described earlier) - as an 'environment'⁷² with specific spatio-temporal and narrative properties.

This space - the chronotope - can be modelled through the application of the isovist concept, allowing the author to conceptualise and picture the transformations of the spatio-temporal chronotopic environment according to observer's position ('vantage point'). For each vantage point three isovists can be drawn, reflecting:

1/ properties and characteristics specifying space distortions;

2/ properties and characteristics specifying time distortions;

3/ properties and characteristics specifying plot generating and the distribution and location of semantic nodes.

The combination of all the vantage point isovists of all three isovists will result in a 'dynamic isovist' (or, as Benedikt calls it, 'a sufficient set' of isovists) of the chronotope or, as I suggest to call it, a 'chronovist'. It is important to stress that, unlike the original notion of the visual isovist, which reflects only one property of the environment, namely visibility, the isovist of chronotope takes into consideration a variety of spatio-temporal and narrative properties. I assume, too, that at every vantage point all possible narrative options are actualized at once. So the notion of 'chronovist' is dynamic not only in regard to the position in space, but also in respect to the 'time position' of the imagined observer.

⁷² I used the term 'environment' as defined by Benedikt, as a space in which 'topological and formal qualities are normally appreciated by continuous free movement through space by an observer always 'immersed' in the environment' (Benedikt, 1979, p. 48)).

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In an artistic text spatio-temporal properties of the chronotope are expressed through the structural properties of the medium. In interactive immersive cinema, as has been defined earlier, the medium comprises audio and visual material displayed in the installation space. Using the same approach as with the chronotope, the combination of installation space and projections can be approached as an environment - in this case a 'visual environment' - a space whose qualities are not only normally perceived by continuous movement, but also a space 'defined by visible surfaces not necessarily perceived as belonging to discrete objects'. Or, as in Gibson's definition quoted by Benedikt, a space with a 'layout of surfaces which gives *structure* to the light scattered from the surfaces' (Benedikt, 1979, p48). A 'dynamic isovist' of this environment can also be calculated and pictured.

Expanding this idea, I suggested that in interactive immersive cinema, the installation environment (a combination of the installation space and projected audio and visual material) could be designed based on a pre-calculated dynamic isovist of the chronotope (or 'chronovist') of the piece. The installation environment would effectively be a rendering of the 'chronotopic environment' through the means of interactive immersive cinema.

To do so, the author would need to determine how each spatio-temporal property of specific chronotopes of the piece could be revealed through properties of the audio/visual media in the installation space.

For temporal aspects of the chronotope the temporal properties of the media approached as a combination of 'action-time' and the natural time of the interlocutor, are (as discussed in Chapter 5): the direction of perceived time and order of events; perceived and absolute speed and duration of events; their frequency, responsiveness and number of simultaneous events.

For spatial aspects of the chronotope the spatial properties of the media are: selectivity (framing), relationship between elements (both within a shot and between consecutive/ adjacent shots) and perspective – point of view (POV).

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The resulting isovists could be represented as an interactive 3D model, similar to architectural isovists of the space rendered by various software, plug-ins and C++ calculations⁷³ as it has been mentioned previously.

Based on this model, the isovists of the installation space can be drawn; then, according to these isovists the installation space can be designed and the projections structured and arranged.

Just as with the isovist of a chronotope, with the isovist of an installation I assume that at every vantage point the interlocutor performs all actions required by the interactive aspect of the installation, actualizing all possible narrative events. The isovist of installation is dynamic, similar to the isovist of the chronotope, not only in respect of the space position, but also regarding the 'time position' of the interlocutor.

While restrictions within the media inevitably prevent the author from achieving an exact representation of the ideal chronotopic environment, designing the installation environment from the dynamic isovist of the chronotope would result in an environment with a dynamic isovist more or less congruent to the isovist of the chronotope of the piece.

Once the installation environment has been designed as a whole, it is possible to break it into distinct elements with precise properties: the shape and size of the installation space; the content of audio and video material, the mode of display; the required interactive algorithms, and so on.

Therefore I suggest that this novel "chronotopic isovist" or 'chronovist' conceptualisation method can provide clear and comprehensive guidance throughout the entire authorship process from inception to production.

9-2. A comprehensive and novel framework.

The 'chronovist' conceptualisation method demonstrates how interactive immersive cinema can be used by the author as a tool for artistic expression and reinstates the significance of author and authorship. Unlike other approaches to interactive narrative, discussed in Chapter 3, I believe that my framework is the only comprehensive method of interactive authorship that combines conceptualization, structuring, content and

⁷³ Grasshopper 1.0, Omnivista and others, as discussed earlier.

'Chronovist' conceptualization method: exploring new approaches to structuring narrative in interactive implementation and provides the author with clear guidance from the inception of the idea to the production process.

When the concept of chronotopic isovist is applied to interactive work, authorship is actualised through a dynamic isovist of the chronotope of the piece and its translation into the installation environment. Narrative is actualised through interaction based on the structural properties of the chronotope; the resulting 'narratives' are 'live-generated' and non-reiterative in nature. The framework is free from the limitations of the other systems:

1/it is possible to use live-action footage;

2/ formal structures are derived from the content;

3/virtually unlimited interlocutor agency; interlocutor is fully involved in the interaction and experiences the narrative at first-hand;

4/produces non-reiterative complex narratives, which cannot be produced in any other media; infinite number of variants;

5/ provides a subjective, highly personal experience of historically created spatio-temporal entities;

6/ the produced narratives represent and artistically interpret reality.

The table on Figure 9-1 shows a comparison with existing approaches to interactive narrative and my framework. As has been stated earlier, the limitation of the '**montage model**' lies in its formality and detachment from the content – or the 'theme of the artistic utterance' as defined by Bakhtin.

The '**story world (sandbox) model**' can be subordinated to the 'theme' or concept because of the nature of procedural authorship but, being a simulation, cannot, as has been argued, perform a representational function.

The third type, **the 'creation model'**, which can perform a representational function and be subordinated to the concept, is incapable of producing narratives with characters.

Figure 9-1.

	<u>'STORY-WORLD MODEL'</u>	<u>'CREATION MODEL'</u>	<u>'MONTAGE MODEL'</u>	<u>'CHRONOTOPE MODEL'</u>
STRUCTURAL ELEMENTS	goal-defined characters, objects, spaces	none as such	units of visual and audio material	units of visual and audio material
HOW IS AUTHORSHIP ACTUALISED?	Authorship is actualised through pre-defined variables (elements of the story-world) and algorithms (arrangement of these elements), created according to author-defined storytelling paradigms	Authorship is actualised through algorithms linking the interpretation of the user's input and live generation of procedural computer imagery; algorithms can be based on simple real-life narratives	Authorship is actualised through an annotated database and interconnecting structure of links;	Authorship is actualised through a dynamic isovist of the chronotope of the piece and its translation into the installation environment, which consists of: algorithms (based on the structural and narrative properties of the chronotope) linking together the interpretation of the user's input, annotated database of material and live generation of computer imagery.
HOW IS NARRATIVE ACTUALISED?	the story-world exists prior to interaction; narrative is actualized through interaction between the user and the story-world	the story-world and its fabric do not exist prior to interaction; the story-world and the narrative are created/ actualized through the interaction; the resulting 'narratives' are 'live-generated' and non-reiterative in nature.	Narrative is actualised through interaction; but the narratives are pre-defined by the annotation and the links structure, and are limited.	Narrative is actualised through interaction based on the structural properties of the chronotope; the resulting 'narratives' are 'live-generated' and non-reiterative in nature.
IMAGE ORIGIN	pre-computed rendered animation live	possible to use live-action footage as a source for computer-generated images; visuals are created as live-rendered computer animation	live-action footage or any other origin	live-action footage or any other origin
LIMITATIONS	1/cannot use live-action footage 2/ AI story engine/agents - have limitations 3/ algorithm-based story narratives are devoid of historicity 4/hand-authoring is labour-consuming; 5/despite an infinite number of combinations, the elements are reiterative in nature;	1/ limited use of live-action footage; 2/produces simple non-verbal narratives; cannot produce complex narratives with characters;	1/formal structures are detached from content; 2/limited interlocutor's agency; 3/ can be labour-consuming to provide a satisfying number of variants.	1/ can use live-action footage; 2/formal structures are derived from the content; 3/virtually unlimited interlocutor agency; interlocutor is fully involved in the interaction and experiences the narrative at first-hand; 4/produces non-reiterative complex narratives which cannot be produced in any other media; infinite number of variants 5/ provides a subjective, highly personal experience of historically created spatio-temporal entities
CAN REPRESENT REALITY?	produced narratives do not represent, but simulate reality.	produced narratives can represent reality.	produced narratives can represent reality.	produced narratives represent and artistically interpret reality

Only the fourth model, the novel framework based on the concept of chronotope (the **'chronotopic isovist model'**), combines the formality of structure with subordination to the 'theme' of the artistic utterance. It can use live-action footage; formal structures are derived from the content; the interlocutor is fully involved in the interaction and experiences the narrative at first-hand; the framework allows the creation of non-reiterative complex narratives which cannot be produced in any other media; an

'Chronovist' conceptualization method: exploring new approaches to structuring narrative in interactive infinite number of variants provides a subjective, highly personal experience of historically created spatio-temporal entities.

9.3. Types of narratives.

As has been shown earlier, Bakhtin used the concept of chronotope to analyse existing artistic discourse, and, in a way, to extract chronotopes from pre-existing texts. I have suggested that the opposite is also possible: that new artistic texts can be constructed to encapsulate and to incarnate pre-existing chronotopes. These pre-existing chronotopes can be more general chronotopes, for example, the chronotope of the road or the chronotope of the encounter. Or they can be more specific, unique chronotopes, for example, the chronotope of an alien world with reversed gravity and backwards-moving time.

I have argued that interactive immersive cinema pieces (or texts) could not only be analysed through the lens of the chronotope concept, but could also be designed and produced based on pre-defined chronotopes, and that this approach would lead to the development of new narrative models as well as also uniquely utilising the specific properties of the media.

The 'chronovist' conceptualisation method influences how a narrative is constructed and expressed, but also, in addition, the types of narratives themselves.

There is no space for a detailed analysis of new emerging 'chronotopic isovist' narratives within the limits of this research. However, I will sketch what I see as specific unique qualities of these narratives.

A chronotopic environment, not a story.

Firstly, narratives have to be 'chronotopic' – produced by a unique spatio-temporal continuum - and specific to this continuum. Therefore, the focus of the author's attention would shift from designing a story to creating/defining plot-producing chronotopes.

First person

The 'chronovist' method presumes the interlocutor as the addressee of the artistic utterance, and suggests to approach interactive immersive audio-visual narrative as a first-hand embodied experience of a chronotopic environment by the interlocutor. It

'Chronovist' conceptualization method: exploring new approaches to structuring narrative in interactive puts the interlocutor in the position of the protagonist. However, third-person narratives should also be possible with the interlocutor becoming an observer, immersed into the chronotopic environment but not participating in unfolding plots.

Three-dimensional

Spatial characteristics of the chronotopic environment in interactive immersive cinema offer new possibilities for spatial structure of narrative, which become three-dimensional (distributed in space) unlike the 2-dimensional conventional narrative.

Multi-stream

A multiple-plot structure literally gains a new dimension through spatial distribution, at the same time expressing specific plot-instigating qualities of a chronotope.

9.4. Possible practical implementations.

The 'chronovist' conceptualisation method' can have different applications and uses. I will sketch here a few.

Installations.

As has been shown in this research, this framework can be used to conceive and develop installation-based interactive immersive cinema pieces from a completely new perspective.

One-screen set-up.

One-screen pieces (designed, for example, for an iPad or a computer) can be approached as a special case of interactive immersive cinema, if the limitation of one screen is justified as a part of the fused chronotopic structure. The simplest example is a structure where the display screen is treated as a window or a mirror. The chronotopic approach would allow a consideration of the physical reality of the screen as a structural part of the piece, participating in immersion and immediacy.

Virtual reality and video games.

'Virtual reality' interactive immersive media can also be considered developed using 'chronovist' conceptualisation method. This includes narrative video games, interactive iPad-based story-telling, and so on.

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There, the interlocutor is presented within a virtual (physically non-existent) space, a simulacrum, completely detached from the immediate physical reality he/she is in. This virtual space can be approached and designed as a chronotopic environment, with different types of immersion and a different sense of immediacy compared with an installation-based piece. Narrative-inclined videogames like *Heavy Rain* and *Beyond: Two Souls* discussed earlier would, in my opinion, benefit especially from this approach, which combines a clear authorship and narrative with the possibility of multiple unique 'readings'.

Other applications.

The proposed framework can also be used as a conceptualisation tool for a variety of borderline cases, including, as I showed in the reflection on my own creative practice, which is in the field of conventional cinema.

Chronotopic isovist-based authoring can be used in theme parks, museum curatorship and in any other situation where a viewer – a visitor – an interlocutor – should be provided with narrative spatio-temporal experiences.

One of the real-life examples is a PhD student setting up the exhibition of her photographs dedicated to the representation of pain at a public hospital. Using the chronotopic approach it would be possible to use the uniqueness of the location and consider the corridor where the exhibition took place as a distinct spatio-temporal reality where the chronotope of a hospital is fused with the chronotope of road/passage (and possibly the chronotope of encounter). It would therefore be possible to consider and orchestrate a narrative experience of the viewer/interlocutor.

9.5. Directions for future research.

I have shown that 'authored' interactive media can be approached as a special case of cultural discourse (in Bakhtin's meaning of the word). Here I will chart the directions of future explorations.

This research concentrated mostly on Bakhtin's concept of chronotope, its creation by the author and its perception by the interlocutor. However, as has been discussed previously, the discourse in interactive immersive work has three important characteristics:

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firstly, it is an author-created utterance with its meaning and intention, addressed to an (ideal/real) interlocutor, which cannot actualise without the addressee;

secondly, this discourse (utterance) is presented in a given time and space to a given (not chosen) interlocutor;

thirdly, the interlocutor is involved in the immediate process of understanding, interpreting and responding to the author's utterance.

The nature of the experience in interactive immersive work can therefore be described as a (non-verbal) conversation: the author tells a story/develops an argument, while the interlocutor empathizes with the story (follows it /asks questions/ prompts for more details /agrees/argues). The analysis of interactive immersive audio/visual piece through this lens raises several questions for the future research:

1. How will the application of the 'non-verbal conversation' framework change the practical task of structuring an interactive narrative? For example, what are the best ways to start this 'conversation'? How to anticipate the interlocutor's 'replies'? How and when to provide a conclusion?

2. In the interactive audio-video piece, utterances of the author are 'pre-recorded', while utterances of the interlocutor are produced 'live'. How will the asymmetrical nature of this communication affect the construction of narrative?

3. How can the notion of understanding be addressed in the new model of interactive immersive narrative? What are the different stages of understanding occurring there? How can this understanding be guided by an author? How does Bakhtin's approach to understanding differ from 'frames' and 'schemata' theories, and can they be combined to build a 'model of the interlocutor' specific to interactive immersive cinema?

4. Another direction of a potentially interesting theoretical quest is to investigate the granularity of 'chronovist' from the point of view of practical procedural authorship.⁷⁴ Can a timeline in Adobe AfterEffects or Flash software be considered a chronotopic environment and can a keyframe (specifying the spatio-temporal state of an object or environment) be treated as a 'chronovist' vantage point? How can temporal and spatial characteristics of chronotope be expressed on this level and how would this affect

⁷⁴ I thank Dr. Chris Hales for the suggestion.

'Chronovist' conceptualization method: exploring new approaches to structuring narrative in interactive procedural authorship? The application of the 'chronovist' approach to procedural authorship in interactive media might lead to the development of new programming algorithms, new narrative structures and new forms of an interlocutor's engagement.

9.6. Bakhtin.

This research provides a novel conceptualisation method for interactive media, but also resituates Bakhtin in modern cultural discourse and reinstates once again the significance and actuality of his work. It is important to stress that in Bakhtin's works 'a culture is interwoven with a personal sense of belonging and responsibility for that culture' (Lesic-Thomas, 2010, p. 47). I share his profound belief that literature and art are of paramount importance for the life of a nation, and, ultimately, for the survival of the whole of humanity, especially today. This research has been inspired by that belief.

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