

Pathfinder

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Pathfinder is an audiovisual performance-game for solo drummer, exploring the synergies between multiple contemporary creative practices. The work navigates between music composition, improvisation, projection/light art and game art. At its heart lies a bespoke electroacoustic instrument, the augmented drum-kit, used not only to provide the sonic content of the work in real-time, but also as a highly expressive game controller that interacts with an instrument-specific game. The musical instrument offers a much wider range of expressive possibilities, control and tactile feedback in comparison to a traditional general-purpose game controller, and as a result it affords a more diverse and nuanced game play performance. Live electronics, lights, projections and the drum-kit all make up the performance-game's universe, within which the performer has to explore, adapt, navigate and complete a journey.

This research aimed to address a number of research questions such as: How can a musical game harness the expressivity of an instrumentalist's performance practice, as opposed to commercial music games using conventional game controllers? How can improvisation, experimentation and failure be quantified and rewarded in an open world musical game scenario? The theoretical underpinnings of the work and findings are documented the upcoming article 'Designing Musical Games for Electroacoustic Improvisation', to be published on the upcoming Organised Sound Journal Vol.26, Number 1 Issue, by Cambridge University Press.

Pathfinder has toured conferences, festivals and exhibitions internationally. These include the International Conference on Live Interfaces (2016), Brighton, New Interfaces for Musical Expression (2016), Brisbane, where the piece also won the conference's best performance award, DiGRA/FDG (2016), Dundee, PRESS PLAY (2016), Dundee, Blank Arcade (2016), Dundee, Games Are for Everyone (2016), Edinburgh, Sonorities Festival of Contemporary Music (2016), Belfast, Edinburgh Science Festival (2017), Edinburgh, and the International Conference of Computer Music, Shanghai (2016).

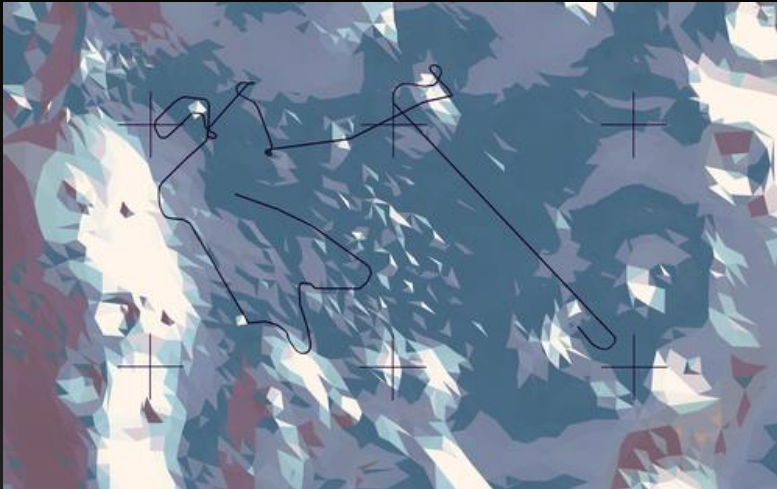


Motivation

Conventional game controllers are designed to fit nearly all possible gaming scenarios and to be used by a wide range of users. They are cheap, accessible, easy to become familiar with, and in a short time they become transparent interfaces between game and player. While the design of a game and the player objectives can be significantly complicated and considerably varying even within the same game, the controllers remain simple in principle, relying on dynamic multi-mapping depending on each interactive experience, in order to provide an accessible physical interface.

This of course does not mean that the game controllers themselves cannot be musically expressive under the right circumstances, as seen in some of the aforementioned games. Additionally, as they are designed to be versatile, they are being used frequently in the New Interfaces for Musical Expression (NIME) community as physical interfaces to complex sound synthesis and interactive music systems. Notable examples include Robert van Heumen who uses a game controller in his project *Shackle* with Anne LaBerge and Alex Nowitz who uses Nintendo Wii controllers for his vocal performance processing environment.

In contrast to the game controller, mastering an acoustic musical instrument requires a lifetime of continuous practice and engagement. Physical resistance from the instrument plays an integral role in this. While there are already commercially available game controllers making use of haptic feedback, such as the Novint Falcon and the Sony DualShock, most of the designed haptic relationships between players and game events are one-way. The intention of this feedback is to either reinforce established game mechanics, or to contribute to game immersion. For instance, haptic feedback synchronised with key events in horror games or weapon recoil in first person shooters, helps further ground the player within the game world. This type of physical resistance is not an inherent difficulty to be mastered, but only an extra dimension to the existing gameplay experience.



Pathfinder

Pathfinder (2016) was premiered at the International Conference on Live Interfaces in 2016 in Brighton. It is a musical game that takes advantage of a drum-kit's bespoke musical vocabulary and turns it into an expressive game controller where all extracted information, including timbral, spectral, dynamic and temporal qualities, informs the progress of the piece. While there is a definite beginning and end to the narrative and a series of events to complete the game, all decisions about the time and order are left to the performer. As the main aim for the game is to take advantage of the established performance practice with the instrument, there were certain concrete design principles from the start:

1. There shouldn't be a predetermined linear game sequence. The performer should be able to move freely and explore the world in any direction on the plane.
2. The game should encourage improvisation, nuance and experimentation.
3. Nothing should happen unless the performer uses the instrument: Lack of musical input results in inactivity in the game.
4. There are no timed-cues or on-screen events that the performer has to synchronise to, and no penalty for being silent or inactive for any period of time.

Documentation available at <http://christosmichalakos.com/works#/pathfinder/>





These principles had as an aim to give to the performer as much freedom as possible, while attempting to create the potential for musically engaging scenarios through visual feedback shown to both performer and audience. While *Guitar Hero* could be described as a timing and synchronisation game, *Pathfinder* could be described as a musical puzzle game. The player needs to be actively observing the relationships between the sonic/gestural input and visual output and understand which parts of the instrument's musical vocabulary are required for each section in order to progress. The difference with a conventional puzzle game where false actions simply delay the game's completion or lead to a fail state is that in *Pathfinder*, erroneous gestures contribute to the musical performance regardless of the fact that they're not contributing to the game's completion. In fact, it is often the case that the performer wanting to prolong a section will not perform the right gestures, until the musical moment for progression is right. The performer has to navigate between four primary improvisation areas and three secondary objectives. All of the primary areas need to be completed successfully in order for the game to finish. The secondary objectives could be seen as side-quests in conventional role-playing games, where their completion has some benefit to the experience but is not necessary in order to finish the game.

GAMEPLAY

The game puts the performer in first person perspective within an open world. A bird's eye perspective of the real-time path and position in the game space is also available. Switching between the two perspectives is possible through a foot pedal. At the start of the game the player has 555 available steps (similarly to the main mechanic of the infamous Atari game *ET The Extraterrestrial* (Atari 1982)). Each step is triggered whenever the microphone detects a transient above a certain threshold from the drum-kit, which happens roughly each time the performer hits the snare drum with a drumstick. This means that the player has to firstly choose how to spend the remaining hits, and towards which direction. The steps are replenished to maximum each time one of the improvisation areas is completed successfully.

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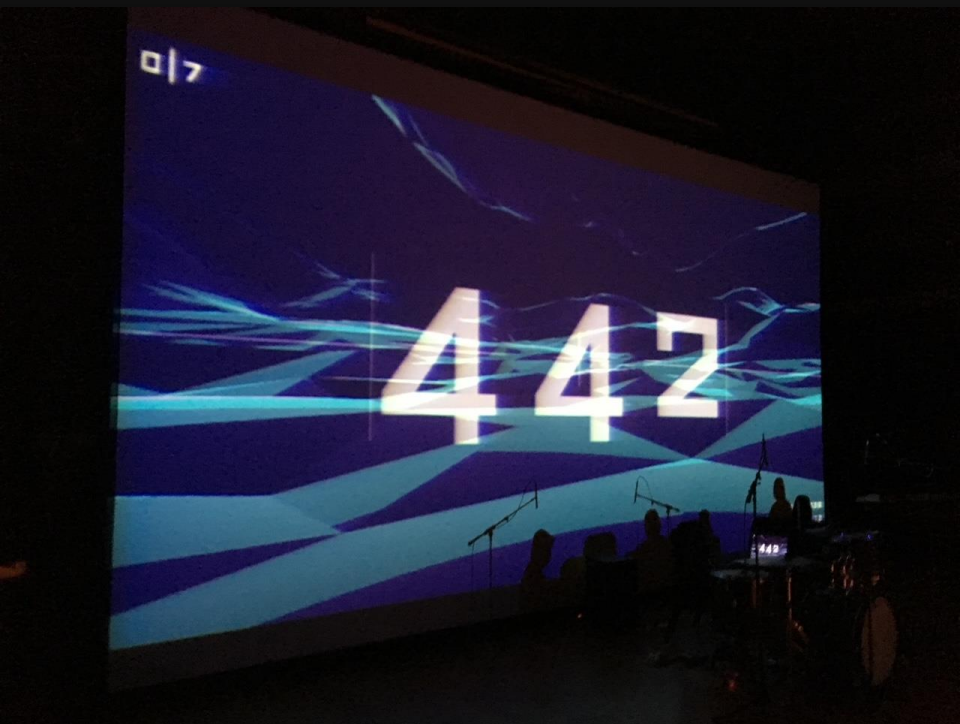


DISCUSSION

The performance itself can take many forms: from a very efficient and quick playthrough lasting only a few minutes, to a sparse and slow performance spending a lot of time within and between each area, to a risky one where only a few steps are left before entering an improvisation area. As a result, the perception of each performance can vary significantly. For example, a riskier performance would mean a more exciting experience for performer and audience, while a longer performance would mean a more meditative experience, exploring the three-dimensional digital landscape to a greater extent. Combinations of all these approaches can be used within the same performance and this was the most common approach to the piece. The aim is for game, music, and instrument to feel as one unified hybrid performance work where the audience does not differentiate between its individual technological components.

DISSEMINATION

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Links:

Photos:

<https://www.flickr.com/photos/63221533@N04/sets/72157672527697972>

Videos:

https://www.youtube.com/watch?v=ur2Qz-67P6A&feature=emb_title

https://www.youtube.com/watch?v=JypMWYmPE0A&feature=emb_title

