Pathfinder:
A performance-game for the augmented drum-kit

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Abstract.

Pathfinder is a 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 electro-acoustic 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.

Keywords: Games, New Instruments for Musical Expression, Interface Design, UI/UX

Augmented Drum-Kit

The augmented drum-kit was developed over the course of five years, and consists of a traditional drum-kit mounted with sensors, contact microphones, speakers and bespoke software. The acoustic kit also becomes the control interface of the electronics with the use of machine listening techniques and gestural analysis resulting in a highly physical performance. There is minimal interaction with the laptop - all control of the electronic sound, game, light and projection control is carried out through the acoustic instrument; the computer serves only as the mediator for all assembled pieces of digital and analogue technology.

Pathfinder

Within the game, the player explores an open environment by navigating through presets and managing resources. Playing too loud or too fast in the beginning, for example, would mean having fewer resources available for exploration later in the game. Also, the world can be explored non-linearly, and is different on each play-through. While the main mechanics are still in place, presets and resources are positioned differently each time the game loads; the player's strategy will have to adapt accordingly in order to explore as many areas of the world as possible. The interaction between the performer and the game ranges from a very clear and direct relationship between physical gesture and result on the screen, to more obscure relationships and mappings, all of which contribute towards driving the performance forward. From a musical perspective, the game can also be seen as the performance's graphic score, shaping the sonic output according to the present game state and the player's actions within each given situation.
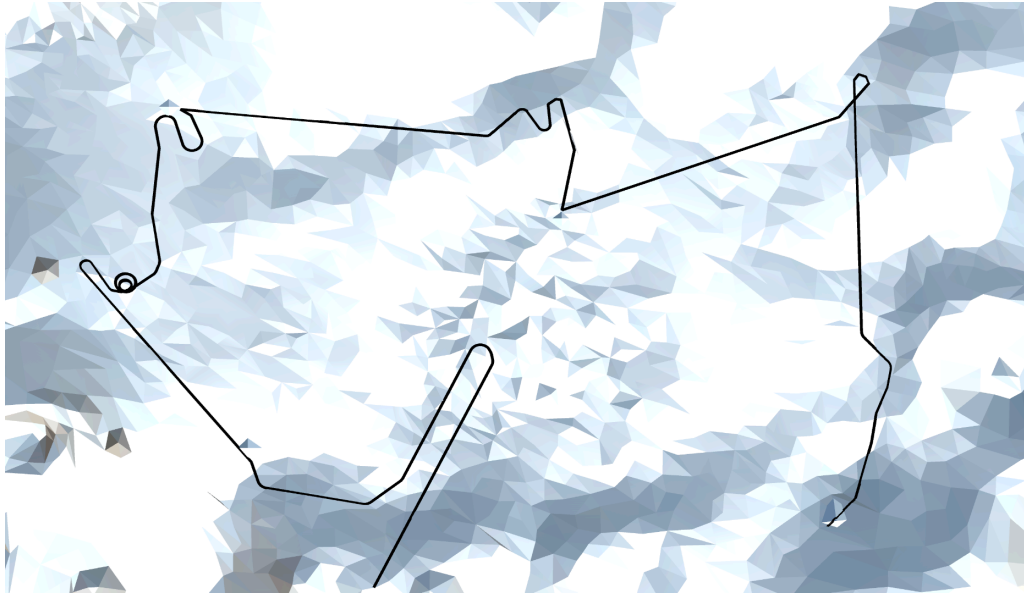
Figure 1. Pathfinder bird's eye view – Navigating through presets

Biography

Christos is a composer, performer, sound artist and software developer. His work explores the relationships between sound, space, games and bespoke performance environments. He has presented works and talked at a wide range of conferences and festivals including the London Jazz Festival (London 2015), Game Developers Conference (San Francisco 2015), ACM Creativity and Cognition (Glasgow 2015), New Interfaces for Musical Expression (Oslo 2011/London 2014), International Computer Music Conference (Ljubljana 2012), International Symposium on Electronic Art (Albuquerque 2012) and Sonorities Festival of Contemporary Music (Belfast 2011/12).

Before joining Abertay University in Dundee as a lecturer focusing on dynamic audio for games and digital media, he worked as lead audio programmer and interface designer on software used in major films and games including Marvel's Avengers: Age of Ultron, Far Cry 4 and Evolve.

Having completed a BSc in Mathematics at the University of Crete in 2006, he moved to Scotland to pursue postgraduate studies at the University of Edinburgh. He gained an MSc in Acoustics and Music Technology, and a PhD in Creative Music Practice in 2013, examined by renowned composer and multi-instrumentalist Fred Frith.