AETHRAKHTHON: Structuring Electroacoustic Improvisation and Performance Using a Game Engine.

CHRISTOS MICHALAKOS, Abertay University

1. PROGRAM NOTES

AETHRAKHTHON is a game-piece using an electronically augmented drum-kit as game controller. The work explores improvised musical environments within a videogame setting, where the player navigates a 3D game-space. This presents the opportunity for a set of musical interactions, sonorities, and performance possibilities through distinct mappings and level design. The performer is free to improvise, fail, explore, and through trial and error understand what the game rules are and complete each challenge. This results in a dynamic audio-visual performance, where while the rules are fixed, each section can be completed in multitude of ways.

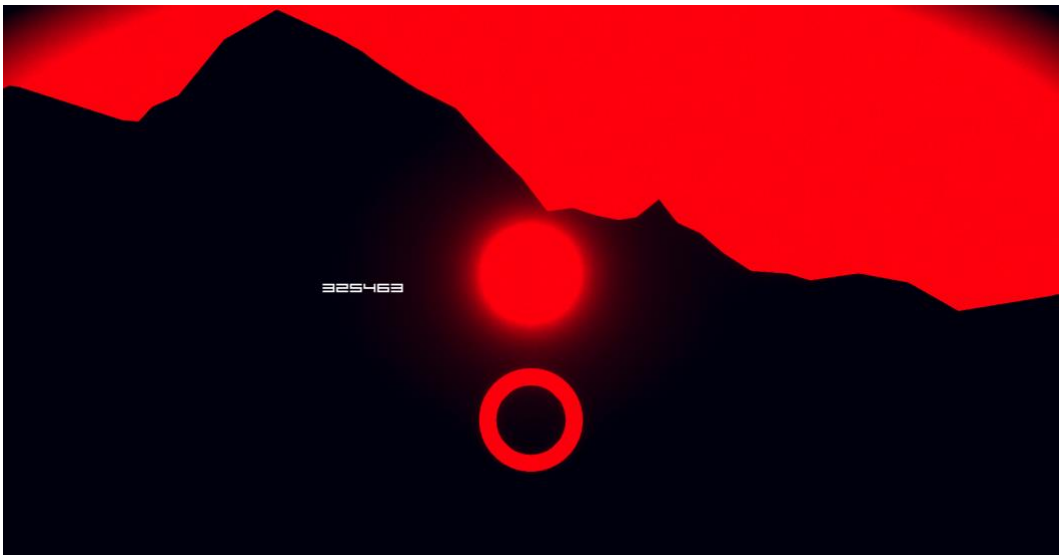


Fig. 1. AETHRAKHTHON Ingame Still.

2. THE INSTRUMENT / GAME CONTROLLER

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 makes use of bespoke software. The acoustic kit becomes the control interface of the electronics and game with the use of machine listening techniques and gestural analysis resulting in a highly physical performance. There is minimal interaction with the laptop during the performance - all control of the electronic sound (including game, lights 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. For this piece, the drum-kit also

DOI:http://dx.doi.org/10.1145/0000000.0000000
Music Proceedings of the International Conference on New Interfaces for Musical Expression
NIME'24, 4–6 September, 2024, Utrecht, The Netherlands

extends into the digital game space: By using Unity3D's physics engine, physical gestures on the acoustic instrument can have a multitude of sonic repercussions on the game's audio, by using various sample-based and synthesis techniques alongside the acoustic sound's live processing. The sound world of the augmented drum-kit is documented in the following solo releases:

Christos Michalakos - Frrriction (2012)
Christos Michalakos - Long Distance (2013)

3. THE GAME

AETHRAKHTHON explores improvised musical structures within a game setting, where the player is free to explore the presented 3D game-space, with an additional menu, powerups, bosses and a fail state. Each of these settings defines a particular set of musical interactions, sonorities, and performance possibilities through distinct mappings and level design. The performer is free to improvise, fail, explore, and through trial and error understand what the game rules are and complete each section. While each scene's rules are fixed, every level can be completed in multitude of ways which reinforces a sense of exploration and experimentation. For this work, the analysis methods used to extract parameter control information from the acoustic drum-kit performance for the live electronics are also used to extract game control information for the bespoke game. The visuals are projected onto a screen behind the performer as seen in figure 4 – performer and audience experience the same visual feedback. 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 the performance's progression. From a musical perspective, the game can also be seen as the performance's graphic score. One of the aims of this work is to explore exactly this two-way conflict: Controlling the game's progression through musical gestures and expression, while the game's rules and mechanics define the performer's affordances. AETHRAKHTHON ranges from 10 to 20 minutes depending on the intentions of the performer and will be premiered at the Symposium as a solo performance.

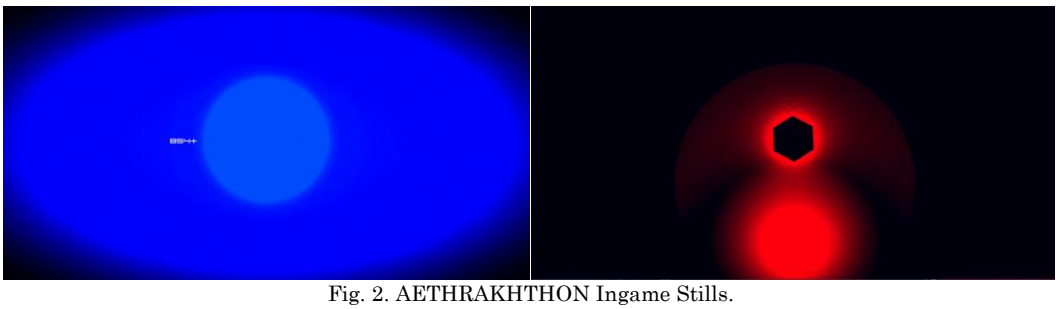


Fig. 2. AETHRAKHTHON Ingame Stills.

4. PREVIOUS GAME-PIECES

Over the past years, the composer has been exploring the use of game engines for various musical purposes, including group and solo performance. This has taken the form of either experimental musical games where the player uses conventional game controllers to navigate a digital space where actions and movement are affecting the sound world of an immersive interactive environment, or the use of acoustic musical instruments as game controllers of instrument-specific games. Most notably, Pathfinder (2016), was premiered at ICLI2016 and performed at various festivals and conferences around the world, including NIME 2016, DiGRA 2016, Sonorities 2016 and ICMC 2017.

Fig. 3. ICARUS premiere setup – **ACM C&C San Diego 2019**

Fig. 4. *Pathfinder* – **NIME, Brisbane 2016**

5. TECHNICAL RIDER

To be provided by the Symposium:

Drums
1x snare drum
1x floor tom
1x bass drum (preferably 18" X 14" or 18" X 16")

Hardware
2x snare drum stands
3x cymbal stands
1x hi-hat stand
1x bass drum pedal
1x rug
1x drum throne (preferably one that goes high)

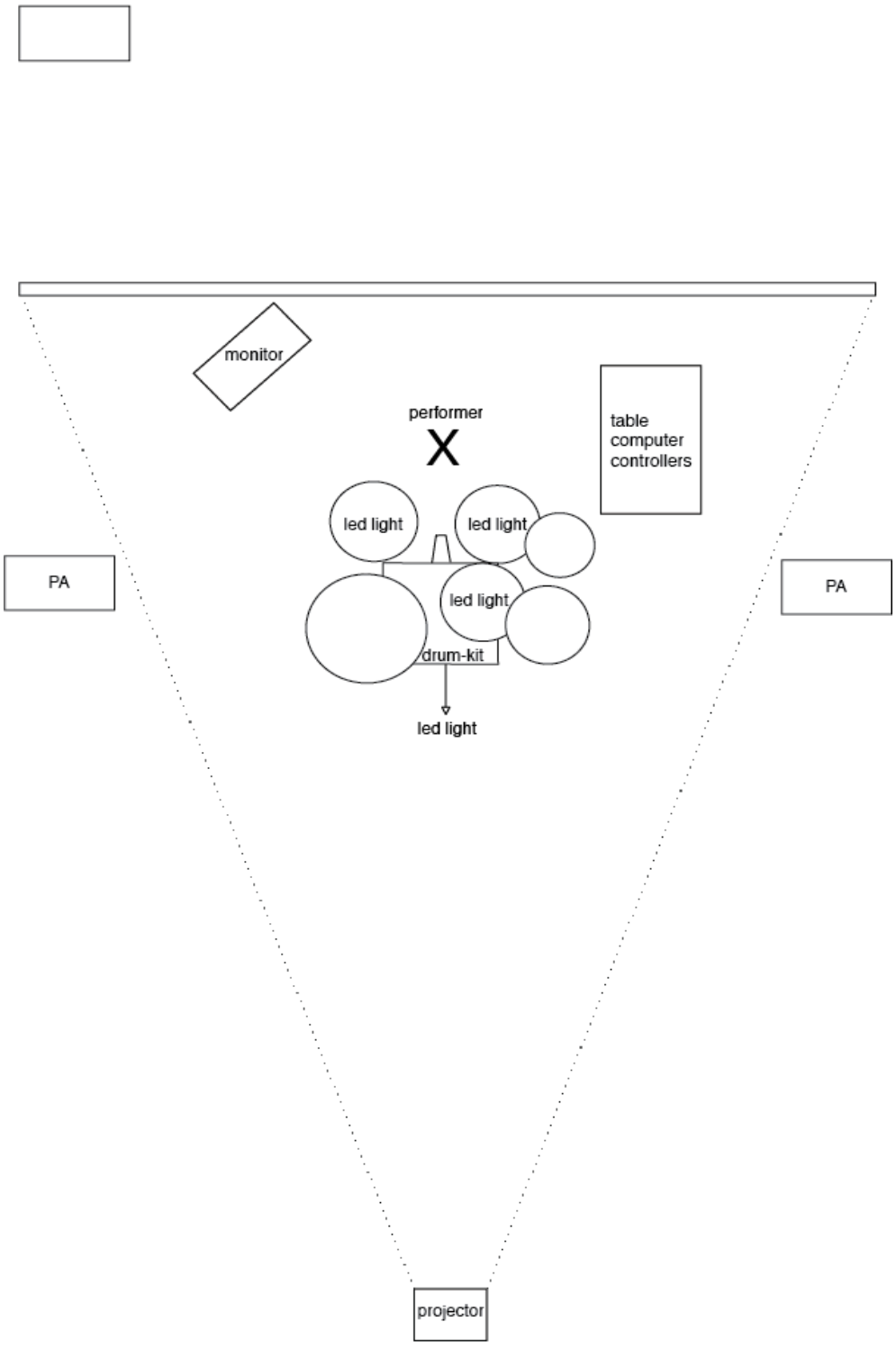
Other
1x speaker (Genelec 8040 or similar, to go under the floor tom)
1x stereo PA System
1x projector
1x small table for computer, audio interface

Also, 1 long HDMI or VGA cable to go from the computer on the stage to the projector. The work will be set up by the composer/performer.

Please note that about **1H (one hour)** is required for the piece set up and soundcheck, and once set the instrument cannot move from its position.

The piece is performed in complete darkness with all light coming from drum-kit lights and game projection.

6. STAGE PLAN


monitor
performer
table
computer
controllers
led light
led light
led light
drum-kit
led light
PA
PA
projector