COMMUNAL

KORAY TAHIROĞLU, Department of Art and Media, Aalto University School of Arts, Design and Architecture, Finland

Additional Key Words and Phrases: AI-Terity, NIME, DMI, GanSpaceSynth, neural networks, GANs, latentspace

ACM Reference Format:
Koray Tahiroğlu. 2024. COMMUNAL. 1, 1 (September 2024), 3 pages. https://doi.org/10.1145/XXXXXXX.XXXXXXX

1 PROGRAM NOTES

The composition Communal is one of a set of performances where the performer and the musical instrument work together to direct, suggest and form a transitional musical narrative. For this performance, the piece takes the form of a collective that allows us to recognise the deeper transformations in the use of AI technologies towards co-determining how music can be present for and perceived by human musicians and audience. The piece was composed using the tools we develop as part of AI-terity and GANSpaceSynth projects. In the context of new interfaces for musical expression, AI technologies serve an integral role today, offering new perspectives to experiment on the ways in which a musical instrument manifests itself in human-technology relation, finding ways to embody itself into the otherness.

2 PROJECT DESCRIPTION

The piece Communal, is a composition written for the AI-terity instrument, idiomatically reflecting the autonomous features of its audio synthesis module. AI-terity instrument is one of the outcomes of our research on digital musical instruments, it is a non-rigid musical instrument and comprises an artificial intelligence (AI) method for generating audio samples for real-time sound synthesis [2, 3]. In this version, new autonomous features are integrated through the use of GANSpaceSynth deep learning hybrid method [4].

The physical manipulation of the tactile surface causes control parameter changes in granular synthesis through which the performer can explore and navigate through the GAN latent space (figure 1). Moving in between different points in the latent space generates audio samples that are in a continuous state of transformation. At the same time, the instrument can also autonomously move in the latent space to generate audio samples, which formulates its self autonomous behaviour in this composition. The main aspect of the autonomous behaviour is to change and transform the music in a flow of uncertainty when the performer stays in a particular point in the latent space for a longer time. The state of the uncertainty becomes the key point of the composition once the performer responses to a new point in the latent space, breaks the flow of the composition and puts music into another transition. The composition provides musical phrases followed by ever-shifting new sounds through GANSpaceSynth deep learning hybrid method for generating relevant audio samples for real-time audio synthesis. The autonomous behaviour of the AI-terity instrument keeps the performer in an uncertainty state in the performance. Appearance of new sounds and being able to move through timber-changes in latent space allow performer to explore a whole new range of musical possibilities with the

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

Fig. 1. AI-terity instrument. photo by Rogier Boogaard

AI-terity instrument [1]. Composition turns into a continuous state of playing and opening up new variety of musical demands.

3 PERFORMANCE NOTES

Al-terity instrument has embedded audio interface, I will connect to the main mixer with 2 balanced 1/4" Jack -TRS plugged cables. In addition to the AI-terity instrument I will use laptop computer which also has its own audio interface which will be connected to the main mixer with 2 balanced 1/4" Jack -TRS plugged cables (Figure 2). There should be enough room on the stage for Al-terity instrument and the laptop. A decent P.A. system, 2 stage monitors, a table 80cm x 80cm and an extension cord with 6 sockets are also required. No technical support is needed other than a soundcheck. The performance would be better in a traditional concert environment.

- A table on stage for the Al-terity instrument
- a decent P.A. system and stage monitors
- an extension cord with 6 sockets

4 MEDIA LINKS

- Video: https://vimeo.com/913266625

ACKNOWLEDGMENTS

This work was supported by the Academy of Finland (project 316549).

ETHICAL STANDARDS

The author conducted this research with sensitivity to the environmental impact that training large neural networks have. I am also aware of, and attempt to responsibly manage the privileged position I have, in part deserved, in part not, that enables me to conduct musical research for a living. To balance possible negative impacts, the author applies his knowledge in a domain intended to celebrate and benefit humanity and to not contribute in any direct way to technologies designed to support some groups of humans to exploit or harm others.

REFERENCES

[1] Koray Tahiroglu and Lonce Wyse. 2024. Latent Spaces as Platforms for Sonic Creativity. In *Proceedings of the 16th International Conference on Computational Creativity, ICCC*, Vol. 24.

[2] Koray Tahiroğlu, Miranda Kastemaa, and Oskar Koli. 2020. Al-terity: Non-Rigid Musical Instrument with Artificial Intelligence Applied to Real-Time Audio Synthesis. In *Proceedings of the International Conference on New Interfaces for Musical Expression*, Romain Michon and Franziska Schroeder (Eds.). Birmingham City University, Birmingham, UK, 337–342. https://doi.org/10.5281/zenodo.4813402

[3] Koray Tahiroğlu, Miranda Kastemaa, and Oskar Koli. 2021. AI-terity 2.0: An Autonomous NIME Featuring GANSpaceSynth Deep Learning Model. In *Proceedings of the International Conference on New Interfaces for Musical Expression*. Shanghai, China, Article 80. https://doi.org/10.21428/92fbeb44.3d0e9e12

[4] Koray Tahiroğlu, Miranda Kastemaa, and Oskar Koli. 2021. GANSpaceSynth: A Hybrid Generative Adversarial Network Architecture for Organising the Latent Space using a Dimensionality Reduction for Real-Time Audio Synthesis. In *Proceedings of the 2nd Joint Conference on AI Music Creativity*. AIMC, 10. https://doi.org/10.5281/zenodo.5137902

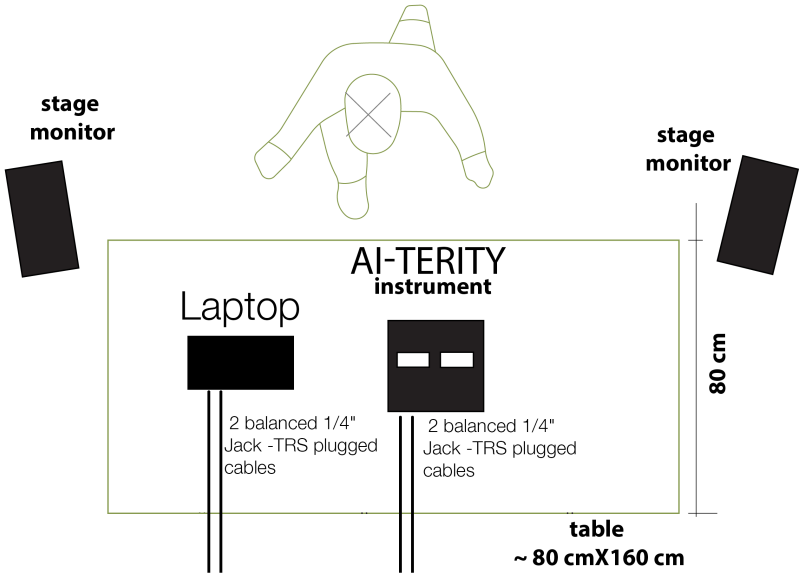

Fig. 2. Stage plan