

REFEREED ABSTRACTS

DEEP IMPROVISER: TURNING A MACHINE LEARNING PARTNER AGAINST MIMESIS

Roger Dean

MARCS Institute for Brain, Behaviour & Development
*austraLYSIS and Western Sydney
University*

Can a composer/improviser rapidly perturb a deep learning computational model with small amounts of new input to personalize its generative output— in other words, to deviate from mimesis? My Deep Improviser project aims to create such a system, comprising a computational deep learning network which is trained on algorithmic or improvised music, and an interaction mechanism that permits modulating its generative outputs. I first describe the current state of Deep Improviser: a fairly simple entity (coded in Keras and Python) with versions for both text and symbolic music, yet applicable in generative work, for example in keyboard performance as partner. I approach the question of anti-mimesis using data augmentation (e.g. by transposition), embedding, and weighting multiple model strands. Various methods of sampling the model outputs are developed in order to assess whether the system achieves deviation. Computational evaluation (including stylometry, with R's *stylo* package) of outputs assesses whether their features are distinct from those of the model corpus, and the new input. The results indicate initial success. A strategy for later evaluating the perceived qualities of the resultant music (or texts) using both expert and non-expert assessors is planned. The considerable complexities (and hence necessary scale) of such evaluation, given a context potentially presenting both live human input (improvisatory, for example) and live computational output, will be discussed.

KW: composition, improvisation, machine learning.

#ME TWO: APPROACHES TO COLLABORATION; MERGING TWO PERFORMERS AND THEIR GESTURE CAPTURE SYSTEMS, VOICES, AND MOVEMENT

Donna Hewitt

Faculty of Humanities, Arts,
Social Sciences and Education
University of New England

Mary Mainsbridge

Department of Media, Music,
Communication and Cultural Studies
Macquarie University

This paper will discuss a new collaboration between Donna Hewitt and Mary Mainsbridge, a relationship initially inspired by the 2018 '#Me Too' campaign and the events that unfolded around the Harvey Weinstein scandal. The work of both artists explores gestural movement and voice in differing ways. Donna Hewitt works with the eMic and a wearable controller that primarily utilises arm and hand movements, while Mary Mainsbridge uses a system that detects whole body motion via the Kinect. With such obvious connections and aligned interests, these artists decided to embark on an artistic collaboration.

Both artists are interested in performance gesture, the relationships between sound and gesture, and the role gesture plays in communication. Preliminary discussion around the work centred on the personal experience and psychological impact of gesture for women, the way gesture defines, depicts, and influences power and the impact that physical gesture can have on personal power.

A big part of this project is the exploration and observation of the collaborative process itself and finding ways to merge different systems and identify collaborative approaches in the absence of established models. The goal is to observe and reflect upon the collaborative approach and to draw comparisons from existing electronic collaborations. Both artists tend to perform solo with their systems and where collaborations do occur they are

typically with other male artists. This collaboration is therefore a unique opportunity for two female artists to come together to compose and perform a new work, building on the theme of empowerment that anchors the piece.

KW: '#Me Too', gestural control of music, eMic, Kinect.

REFLECTIONS UPON COMPOSING FOR AND PERFORMING WITH GESTURAL CONTROLLERS

Donna Hewitt

Faculty of Humanities, Arts, Social Sciences and Education
University of New England

As a composer/performer developing works for gestural controllers for the past ten plus years, the visual experience for the audience has always been a significant consideration in terms of the way a piece is devised. Often the gestural choreography will precede the music and inform the musical decisions that are made. At times the gestural experience for me as the performer also informs the kinds of sound and visual relationships that I want to happen. It has occurred to me over time that my work has much more in common with composing for film or moving images than for musical instruments alone. We often say that we are going to see a music performance, indicating the importance of the visual component for the audience. For traditional instruments, however, it is far less likely that the composer is making decisions about the music based on what the performer's gestures might look like.

This paper will discuss these issues in light of my performing experience with the eMic (extended mic-stand interface controller) and more recently with wearable controllers. These performances include solo works as well as collaborative works and the compositions also include works in which the performer is controlling other media elements such as lighting. The paper will consider the role of Chion's concept of synchresis in relation to gestural controllers and will explore some of the prevailing attitudes and biases that I have encountered around composing for gestural instruments/interfaces. These include the desire for mapping transparency and the negative attitude toward the use of backing tracks or pre-recorded materials. The paper will draw upon film theory and the role of music in film and discuss how this is relevant to my compositional thinking with gestural interfaces.

KW: gestural controllers, gestural choreography, eMic, composition.

THE INTEGRATION OF CYMATICS WITH AUDIO/VISUAL COMPOSITION USING THE HYDROWOOFER

Jean-Michel Maujean

Western Australian Academy of Performing Arts
Edith Cowan University

Coined by Hans Jenny in 1967, the term 'Cymatics' refers to the study of vibrational phenomena as vibrational energy that transfers from one medium to another. The earliest explorations of these phenomena date back to 1680 when Robert Hooke drew a violin bow across the edge of a glass plate that had powder sprinkled on top. Hooke observed nodal patterns that formed in the powder—patterns that were related to the frequency generated by the bowing and the internal resonance of the plate. These patterns provide a visual representation of the relationship between sound and the environment within which it propagates.

Jenny conducted a number of experiments with speakers filled with various liquids, playing different sounds and photographing and documenting the resultant cymatic images. Following on from Jenny's work, this research has constructed the Hydrowoofers—a sealed subwoofer that is filled with water. A camera is mounted

above the speaker, capturing reflections of coloured light from the vibrating water surface. The resultant patterns can be observed as analogous to how the human eardrum sympathetically responds to sounds within the environment. This synergy of coloured light, sound and cymatics has underpinned a number of creative works that explore visual sound and inform our understanding of how sound propagates. This presentation will discuss the components of the hydrowoofer, demonstrate some of the observed phenomena and outline a plan for further study.

KW: cymatics, hydrowoofer, audio/visual composition.