English version of the program of the 2nd Seminar on Artificial Intelligence applied to Sound and Music Composition

This is a preliminary and unordered program of the seminar which will be completed and scheduled.

Suguru Goto: The Technique of Contemporary Music Composition with using Deep Learning.

As a matter of fact, this composition is not an example of performing while using AI on the stage, but rather an example of using Deep Learning to compose and intends an instrumental performer to play it with a score. In order to do this, one may raise the following questions: Can Deep Learning really influence on the progress of composition? For a compositional use, how should AI be used for the development of music? What kinds of new ideas can be explored to compose with Deep Learning? Rather, can it lead to new ideas? Can the algorithm that is regarded as a part of AI be used to truly surpass the traditional algorithmic composition?

Jie Man: Introduction of bach library in Max/MSP.

Introduction of a library for the Max/Msp environment named bach, by which the two elements — computer-aided composition and real-time environment can be combined. The usage and practical examples of the bach library will also be discussed.

Shinae Kang: A discussion of works created with the aid of AI and AI research trends for music.

Shinae Kang introduces artworks created with the aid of AI and AI research trends for music. Plus, she talks about the future possibilities of AI in the music area.

Jinwoong Kim: Orchidea, An intelligent assisted orchestration tool.

Jinwoong Kim talks about Orchidea, which is an assisted orchestration tool developed in IRCAM. He introduces concepts of Orchidea and which AI techniques Orchidea uses.

Sachi Tanihara: AI composition and physicality --from Virtual Composer-Singer to Music Robots all over the world--

Currently, like most artificial intelligence has no physicality, most AI composition is the thing that is replaced the composer's brain artificially. However, researches, that may be called "AI music body agent" provided with both intelligence and body for the musical composition, are progressing in the world recently. Therefore, entitling "AI composition and physicality", I would like to talk about the possibilities of artificial intelligence that connects the composer's intelligence and his body, such as AI composer-musician robots around the world.

Philippe Esling: ACIDS - Artificial Creative Intelligence.

The Artificial Creative Intelligence and Data Science (ACIDS) team at IRCAM seeks to model musical creativity by targeting the properties of audio mixtures. This studies the intersection between symbol (score) and signal (audio) representations to understand and control the manifolds of musical information. After introducing the framework of modeling creativity through mathematical probabilities, we will discuss the question of disentangling manifolds of factors of audio variation. We will detail several models and musical pieces produced by our team, allowing to travel through topological spaces of audio, working with audio waveforms and scores alike and controlling audio synthesizers with our voice.

Daisuke Saito: Modeling of chorus singing by a signal processing approach.

This presentation discusses modeling of chorus singing by a signal processing approach. The quality of synthesized speech has been improved drastically by the development of deep learning techniques. In particular, direct modeling of sampled points such as WaveNet can generate as natural sounds as real ones. On the other hand, in order to model simultaneous singing from multiple singers, unique points such as harmony between the multiple singers should be taken into account. In this presentation, our recent approaches to chorus singing based on source-filter model are introduced.

Naotake Masuda: Audio Synthesizer Control using Deep Generative Models and Normalizing Flows.

Audio synthesizers have become a staple in modern day music production. However, synthesizers have numerous parameters that are complexly intertwined. Thus, producers often find it difficult to produce a specific sound with a synthesizer. We propose a Variational Auto-Encoder(VAE) based model which allows us to efficiently perform inference of parameters and provide a more intuitive control for synthesizers. We report our results on several VST synthesizers and discuss the challenges in modeling different kinds of synthesizers.

Adrien Bitton: Neural granular sound synthesis for raw waveform generation.

Granular synthesis is a broadly used technique for sound synthesis. Its underlying concepts relate to generative neural networks, which can implement it and address some traditional limitations of the technique. It is an avenue of research for raw waveform generation that has not been yet studied in the machine learning community. Introducing a Variational Auto-Encoder model suited to this extent, we will discuss the interpretability of its components and report experiments for musical note and drum generation as well as texture synthesis and non-musical audio generation.