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'Voodoo Muzak Networks'

'Voodoo Muzak Networks' (or VMN) is a program software for musical performances. It links several musicians via a network (here the Internet) with an audio system and allows them to play music together from different locations. Rather than simply mixing together the audio streams provided by each musician, the computer has an essential role of conductor. It decides when to playback the streams according mainly to a tempo. It can also record and sample dynamically some parts of the incoming streams and play them back at specified times of its choice to create its own melody if it judges that the current playing does not make sense. Performing music with VMN is like playing with 'another player', a virtual player who understands the basic rules of music composition such as timing and harmony.

The program VMN records each musician (3 groups of) in real time and compresses the audio in Ogg Vorbis or MP3 format. The streams are sent instantaneously to one another via the application. The principle is the same as having a conversation with somebody through a third person. However, the distances that separate musicians, their connection speed and the network congestion are inevitable factors that create delays. To understand simply what are the consequences of those delays with the previous human conversation example, we may be answered "yes" to "what is your name ?" and "Richard" to "What' s your favorite meal ?".

From a musical point of view, certain sequences of notes work, some others do not. Ideally, VMN would recognize notes or pitches (words in human language) and then would easily sequence them again to create an harmony (conversation) that makes more sense to each musician. But pitch recognition is a difficult issue that scientists have not completely solved yet. However, because of their mathematical construction rhythmic patterns are easier to integrate in a computer program such as Voodoo Muzak Networks.

A MIDI file is like a diagram that represents the structure of a song in terms of notes and rhythms on a timeline. VMN uses MIDI files in combination with a MIDI tempo primordially to create an 'audio click' for the musicians to play on and to resynchronize the streams together. But it also uses them to compare what is meant to be played to what is really happening (with the delays). Then, it can detect rhythmic patterns, whether or not there is a discordance of notes coming up and decide to play another part (that would have been sampled earlier) instead.

"Neuro-Drummer" is a project started in 1989 by Masako Nishijima and Yuji Kijima. *It used neural net technology to create an artificial "partner" for a human drummer. A neural network is a kind of computer program that gains expertise at a task by testing its own performance against human-specified criteria over a number of trials, and thus, in a limited but powerful sense, the program "learns" how to perform that task by trial and error.*

Inspired by the Neuro-Drummer project, VMN can take up to three inputs (the three streams) to gain an understanding of rhythmic patterns and harmony. During the performance, the delays create inevitably a discordance of harmony which lasts a short period of time when the melody changes. It is at that moment that the computer decides to play something else on top of the live audio of the musicians using VMN. The program bases its tries on previous consonances which were planned on the MIDI file and thus 'agreed as good'. If the musician does not think the choice is good, he can activate a foot controller that either cut the audio off during the discordance or trigger another try. The computer understands this as a failure.

Originally, Voodoo Muzak Networks aimed at integrating the delays created by the network between musicians, in the musical composition (the third person in the conversation). But the musical composition was getting more and more limited that way. The system of live sampling that prevents discordances of harmony came out later on. Because of that, the program software soon started to lose the 'random side' that was giving the computer a role of player and started to look more like an enhanced sequencer. Now, thanks to the neural net technology the development of VMN tends to give back the computer an involvement in the musical composition enabling it to a certain freedom of valuations and choices.

As a musician and somehow a programmer, I would not define Voodoo Muzak

Networks as a useful tool to do music on the Internet. I would rather introduce it as an artificial partner to compose music. For years now, the use of computers has been multiplying our capacity to compose music even for a non musician. But it has also confused the role of the computer inside the composition itself. In parallel, artificial intelligence is probably an impossible task to accomplish which relies more on scientific approaches. However, developing a certain consciousness in a particular context has already given good results. In that sense, I think VMN is a successful piece that explores the possibilities that computers bring to music composition through a network and also participates to the research of an intelligent relationship between human beings and technology.

References

Similar projects of music on line:
<http://130.208.220.190/panse/whats.htm>

Open source music software pure-data:
<http://crca.ucsd.edu/~emsp/Software>

Artificial Intelligence and Neural Networks:
Masako Nishijima and Yuji Kijima, "Learning a Sense of Rhythm with a Neural Network: The Neuro-Drummer," Proceedings of the First International Conference on Music Perception and Cognition, Kyoto, Japan, October, 1989, pp.77-80

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