Generating Electronica through Corpus-based Methods

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Abstract

Generative music has been successful in styles that provide clear rules for creators: tonal music [2], free jazz [7], and Electronic Dance Music [3]. While such rule-based systems offer initial success, difficulties arise through the need of expressing finer gradations of rules. A more flexible approach is by learning through analysis of a given corpus. Machine learning, as demonstrated within Music Information Retrieval (MIR), is a hot topic of research, although still very much in its infancy. Collins, for example, stated his automated EDM analysis system "cannot be claimed to be on a par with the musicologist's ear" [1].

The Generative Electronica Research Project at Simon Fraser University has undertaken a long-term investigation into creating EDM through generative methods, using a corpus of human-transcribed tracks as models. We have produced systems that range from those that are completely autonomous – in which complete EDM compositions are generated by running the program – to those that allow more interaction, including parameter control and regeneration of individual parts.

Decisions such as how beats are constructed and varied, the relationship between certain parts –drums and bass, for example [4], harmonic progression, and

the overall form of the composition [5] are all derived from the corpus through analysis, without quotation, and without resorting to personal algorithms.

At the moment, the corpus consists of two main styles – Breakbeat and House – divided by year, containing models representative of many tracks from each era:

- Early Breakbeat (2001-2006)

- Late BreakBeat (2007-2012)

- Early House Music (1989-2000)

- Late House Music (2001-2012)

Not only is it possible to replicate existing styles, these systems offer the potential for *combinatorial creativity*, producing new styles that are not simply mashups, but intelligently combined mixtures of distinctive elements of two or more styles [6]. For example, given the above styles, we have created music that incorporates the harmonic progression of House music with the rhythmic complexity of breakbeat music, including drum fills (which are conspicuously missing in House music).

Of note is that the systems have been produced by composers, rather than computer scientists; as such, the success of these systems are determined by their ability to produce musically interesting output, rather than demonstrate or investigate a specific scientific algorithm.

One system, GESMI (Arne Eigenfeldt), has released an album of breakbeat music:

https://soundcloud.com/loadbang/sets/represse d-calm

GESMI's soundcloud page, which includes several House tracks as well:

https://soundcloud.com/loadbang

GEDMAS (Chris Anderson) output on soundcloud:

https://soundcloud.com/pitter-pattr/sets/meh

GEMSI's output has also been released by an independent label, chord punch:

http://chordpunch.com/cp0x0e/

Output of the systems have been presented at MuMe Weekend 2013 Sydney[1], Creativity and Cognition 2013 Sydney[2], xCoAx 2013 Bergamo[3], ISMIR 2013 Curitiba[4], Expressive 2013 Vancouver[5].

References
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