

“Interacting with a Musical Learning System: The Continuator”
François Pachet

This project attempts to allow a system, in real time, to learn parts of a performance and to continue that performance in the same style. The system bridges the gap between interactive musical systems and music composition systems. Interactive musical systems can transform a musical input to a modified musical output. They don't have a memory of the past and cannot keep with a consistent style. Music composition systems can generate music of a consistent style. They do not allow for any real interaction with the user and thus cannot be used like a musical instrument.

In the Continuator, each phrase is sent to the phrase analyzer. The phrase analyzer builds up a hierarchical tree of sequences and subsequences, weighed by the number of occurrences. The input sequence is subject to a reduction formula. The system learns from the output of a reduction formula which takes into consideration, the pitch and duration. The generation phase of the system continuously tries to compute successive continuations. When no continuation can be found, a more refined reduction function is used on the sequence. The Continuator is able to detect the end of the player's phrases. When the amount of the time elapsed from the last note exceeds a threshold value, a new phrase is detected.

The Markov generation of sequences can be biased in order to produce more realistic music sequences. This can be used in jazz, where the chords in the performance are not as predictable. A fitness function is used to bias the generation. The Continuator can also operate by accompanying the player in the same style.

Through experimentation, they found the computer generated sequences to be indistinguishable from the player's sequences. The limit of this system is that it cannot fool the listener for complete pieces. Another interesting possibly not brought up by the paper, is the ability to categorize music based on the databases formed by the system.