DataMill: Rigorous Performance Evaluation Made A Cyber-Physical System Approach to Automatic Music Accompaniment

Arshia Cont,
ircam, Paris

Where: Jakob-Haringer-Str. 2, Room T02

When: Thuesday, March 10, 2015, 14:30 s.t.

A system capable of undertaking automatic musical accompaniment with human musicians should be minimally able to undertake real-time listening of incoming music signals from human musicians, and synchronize its own actions in real-time with that of musicians according to a music score. To this, one must also add the following requirements to assure correctness: Fault-tolerance to human or machine listening errors, and best-effort (in contrast to optimal) strategies for synchronizing heterogeneous flows of information.

Our approach in Antescofo consists of a tight coupling of real-time Machine Listening and Reactive and Timed-Synchronous systems. The machine listening in Antescofo is in charge of encoding the dynamics of the outside environment (i.e. musicians) in terms of incoming events, tempo and other parameters from incoming polyphonic audio signal; whereas the synchronous timed and reactive component is in charge of assuring correctness of generated accompaniment.

The novelty in Antescofo approach lies in its focus on Time as a semantic property tied to correctness rather than a performance metric. Creating automatic accompaniment out of symbolic (MIDI) or audio data follows the same procedure, with explicit attributes for synchronization and fault-tolerance strategies in the language that might vary between different styles of music. In this sense, Antescofo is a cyber-physical system featuring a tight integration of, and coordination between heterogeneous systems including human musicians in the loop of computing.

We will present current research problems in this settings and showcase some challenges around the embedding of automatic accompaniment procedures.

Arshia Cont is a research scientist at Ircam, a center dedicated to fostering arts and science collaboration in Paris. He obtained his PhD in computer music at UCSD in 2008, awarded the best computer science PhD by the French Academy of Science in 2009. His research focuses on artificial intelligence with applications in music composition and performance. He is the leader of the award winning software Antescofo and enjoyed collaborations with composers such as Pierre Boulez, Jonathan Harvey and Marco Stroppa. He has appeared as computer musician in various performances involving live electronic music with ensembles such as LA Philharmonics, Berlin Philharmonics, BBC Orchestra, Chicago Symphony. Since 2012, he is the scientific leader of the MuTant research team at Ircam and Inria and also the director of Research/Creativity Interfaces Department at Ircam, coordinating artistic and scientific activities in the institution..

UNIVERSITÄT SALZBURG

Software Systems Center
Colloqium Series

host: Christoph Kirsch