

Controlling Interactive Music Performance (CIM)

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Abstract

Controlling Interactive Music (CIM) is an interactive music system for human-computer duets. Designed as a creativity support system it explores the metaphor of human-machine symbiosis, where the phenomenological experience of interacting with CIM has both a degree of instrumentality and a sense of partnership. Building on Pachet's (2006) notion of reflexivity, Young's (2009) explorations of conversational interaction protocols, and Whalley's (2012) experiments in networked human-computer music interaction, as well as our own previous work in interactive music systems (Gifford & Brown 2011), CIM applies an activity/relationality/prominence based model of musical duet interaction. Evaluation of the system from both audience and performer perspectives yielded consensus views that interacting with CIM evokes a sense of agency, stimulates creativity, and is engaging.

Description

The CIM system is an interactive music system for use in human-machine creative partnerships. It is designed to sit at a mid-point of the autonomy spectrum, according to Rowe's instrument paradigm vs player paradigm continuum. CIM accepts MIDI input from a human performer, and improvises musical accompaniment.

CIM's behaviour is directed by our model of duet interaction, which utilises various conversational, contrapuntal and accompaniment metaphors to determine appropriate musical behaviour. An important facet of this duet model is the notion of turn-taking – where the system and the human swap roles as the musical initiator.

To facilitate turn-taking, the system includes some mechanisms for detecting musical phrases, and their completion. This way the system can change roles at musically appropriate times. Our early implementation of this system simply listened for periods of silence as a cue that the human performer had finished a phrase. Whilst this method is efficient and robust, it limits duet interaction and leads to a discontinuous musical result.

This behaviour, whilst imbuing CIM with a sense of autonomy and independence, detracts from ensemble unity and interrupts musical flow. To address this deficiency, we implemented some enchronic segmentation measures, allow-

ing for inter-part elision. Inter-part elision is where phrase-end in one voice coincides with (or is anticipated by) phrase-start in a second voice.

In order to allow for inter-part elision, opportunistic decision making, and other synchronous devices for enhancing musical flow, we have implemented some measures of musical closure as secondary segmentation indicators. Additionally these measures guide CIM's own output, facilitating generation of coherent phrase structure.



Figure 1: A musician interacting with the CIM system

References

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