Gudar – A Novel Group Music Instrument

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Abstract: This interactive experience explores a novel group music instrument – the gudar (**g**roup m**u**sic ra**dar**) which allows groups of people to improvise and compose music over time in new and engaging ways. It has an interface which non-musicians can use whilst still being enjoyable for more the musically adept. The interactive experience aims to break down the distinction between the music composer and the audience.

Keywords: music, interaction, collaboration

1 Introduction

Collaborative improvisation, composition, and performance of music constitute a basic and distinctive form of human interaction. Moreover, the separation between audience and perfomer(s), and between composition and performance, typical of music performed in western cultures are not representative of musical performance in general *e.g.* classical Indian music where performances are a balance between pre-composed and improvised music (Titon, 1996). Across cultures, the production and enjoyment of music is typically an open, collaborative activity more analogous to informal conversation or story telling than to a formal lecture. Current group music improvisation and composition systems do not support these features well. This interactive experience explores an environment in which participants can partake of engaging musical collaborations at a variety of levels using a novel group music instrument.

2 Current Approaches

State of the art technology for individual and group music production focuses on two areas: novel tools for improvisation typically characterised as new forms of instruments, and the development of technologies for composing and editing music.

New forms of instruments aimed at individual improvisation are exemplified by systems such as the Electric Circus (Coady, 2002) which provides an instrument played by jumping on a giant floor mounted 'keyboard' of sounds. New means of individual composition are exemplified by the mixed reality techniques employed by the 'augmented composer' (Berry, 2002) in which computer recognisable cards, supplemented by aural and visual feedback, are arranged on a table to create musical phrases. Similarly, commercial systems such as CuBase (Steinberg Media Technologies AG) provide sophisticated tools that focus on supporting individual users in the composition, revision and reworking of music.

From a group music perspective, composition is supported by commercial systems such as Rocket network (rocketnetwork.com) where support for group composition is limited to file sharing across networks, not the process of collaboration *per se*. Work on group improvisation technologies is less advanced. Research such as FMOL (Jordà, 2001b) and webdrum (Burk, 2000) have begun to explore the collaborative requirements for group improvisation in geographically remote locations. This typically involves developing a shared visualisation of the music being produced and some primitive communication support. However, there are few engaging group music environments which reduce the distinction between audience and composer – this interactive experience starts to address this issue.

3 Gudar

The gudar (**g**roup m**u**sic ra**dar**) provides for group music improvisation and composition drawing on technical solutions such as webdrum and interaction solutions such as the Electric Circus whilst focussig on the communicative features of collaboration. A shared and replicated user interface provides a novel

means of constructing loops of music which can be manipulated by participants. The user interface focuses on the human communication going on in the improvisation over and above the music production. As such there are indications of who is contributing what, and comments appear directly with respect to the music representation. In addition, users can store, retrieve, edit, and annotate works to allow for longer term collaboration and composition.

The main user interface presents a loop of music in a circular form with a rotating 'arm' indicating the current notes being played. Notes range from lowest in the centre to highest on the outside of the circle. Figure 1 shows the basic display with possible notes indicated as grey circles and the play arm displayed as a line across them which travels clockwise – the notes under the arm are the ones currently being played. In this example a simple rising and falling sequence of notes has been created algorithmically (the light filled blobs) and added to by users (the dark filled blobs). Users can add and remove notes with the aid of some input device such as a mouse or a touch screen, and each user is represented by their own colour of notes. They can also add annotations to any part of the space of the instrument as illustrated in figure 1. The instrument is simple enough to be used by novice musicians whilst providing for enough creative potential to satisfy the more musically minded.

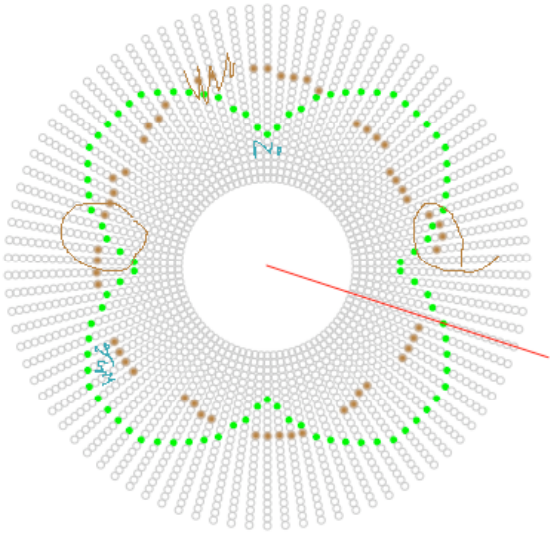

Figure 1: User interface for gudar

3.1 Physical setup

A wireless peer to peer network will be set up connecting at least two mobile A4 sized touch screen tablets (we have two Fujitsu tablet PCs with audio, touch screen facilities, and wireless networking for this purpose). The intention is to provide both physically co-present and remote access to the group music improvisation so providing a novel and engaging experience whilst being un-intimidating in order to break down boundaries between audience and composer. Figure 2 illustrates a possible configuration of two tablet PCs in separate rooms with a wireless connection. Users interact with the music and remote participants through the touch screens. We do not envisage limiting the number of participants.

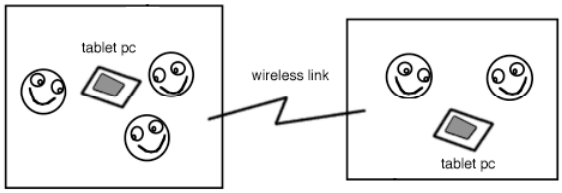

Figure 2: Possible physical set up

Users will also be able to store, retrieve, edit, and annotate works over the period of the conference so developing a musical community. We anticipate that some users may wish to perform their pieces by the end of the conference.

4 Summary

This interactive experience presents gudar, a novel group music instrument. This provides people with the experience of group music improvisation whilst being both co-located and remotely collaborating with others. The novelty of the experience lies in the form of the instrument, the setting, and the theoretical background to the design.

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