

# Designing for Group Creativity

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## Abstract

This work examines the features of human communication pertinent to collaboration. The domain of group music improvisation is used to explore the features of collaboration and to illustrate current support for such interaction.

## 1 Introduction

Collaboration is a fundamental form of human activity. We characterise mutually engaging collaborations as highly focussed activities pushing at the boundaries of participants' shared understandings of experience and expectation. There has been little research on the nature and support for mutual engagement in collaboration. This work sets out some features of human interaction that are believed to have an effect on the engagement between participants and suggests interface features of groupware tools that could support them.

## 2 Group Music Improvisation

Group music improvisation is taken as a paradigm example of collaboration which can be mutually engaging. Such activities are little understood, and poorly supported – understanding how to support them has implications for all forms of collaboration and groupware. Currently support tends to focus on music file sharing within groups of individual composers, not on group music improvisation *per se*. For example, 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 whereas systems such as Rocket network (rocketnetwork.com) support group composition purely through limited to file sharing across networks. Research has started to address this issue by providing shared synchronous music composition tools within which groups of remote users can improvise *e.g.* WebDrum (Burk, 2000), MetaTone (Leach, 2001), GUDar (Bryan-Kinns *et al.*, 2003).

### 2.1 Studies of Group Music Improvisation

This work summarises short informal studies of three group music improvisation tools – MetaTone (Leach, 2001), WebDrum I (Burk, 2000), and WebDrum II (<http://www.transjam.com/>). Each tool provides relatively similar interaction consisting of a sequence of notes on various instruments, or sample, shared *via* a central server. Figure 1a illustrates an extract of WebDrum II's user interface displaying a sequence of notes which the user can edit and manipulate. When notes are changed by users the updates are propagated to others *via* the server. The tools used different propagation mechanisms with WebDrum I relying on an explicit fetch of new notes by users, whereas MetaTone and WebDrum II automatically updated each users' view of the shared composition. All tools also provided text chat as illustrated

in figure 1b, and some tools provided more sophisticated annotation mechanisms such as MetaTone's post-it note style annotation and graphical marking of areas of the sequence.

Each study involved two or three participants creating short sequences of music using the tools remotely (no physical proximity). The text chat transcripts and observations of use were then analysed to identify the forms of interaction that generated the greatest problems for users (as indicated by amount of text chat about these issues) and what user interface features these related to. For example, discussion of which particular notes other users were trying to refer to indicates a lack of support for localisation within the music being composed.

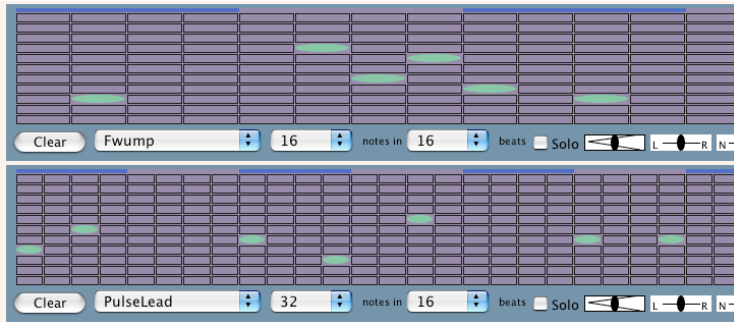
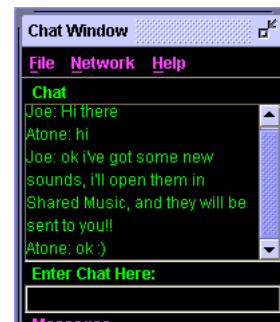


Figure 1a: Extract of WebDrum II main user interface



1b: MetaTone's text chat

Findings from the observations indicate that although the tools provide different support for joint action, and allow participants to jointly create music there is an overall tendency for users to compose individually and then combine finished pieces rather than create together. We suggest that the following features of human interaction are necessary to increase the propensity of participants to jointly produce creatively:

- Localisation within the artefact being produced.
- Mutual awareness of actions.
- Mutual modifiability.
- Shared and consistent representation.

These features are used to propose a new user interface design for group music improvisation (Bryan-Kinns *et al.*, 2003) and groupware in general. It is proposed that by designing tools with the features above in mind the reliance on text chat will be reduced and possibly eliminated. This will be the subject of future evaluation and theoretical work.

## References

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