

Position Paper for CHI 2006 Workshop: "Sketching" Nurturing Creativity

Sketching to Support Representation in Collaborative Musical Composition

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Introduction

The main focus of our research is the design of interfaces and tools that support musical creativity, and studies so far have pointed to the need for interfaces that better support the expression of partially formed composition ideas, essentially musical sketching. The research is explained below and in more detail with background literature in a CHI 2006 paper [2].

Comparing composers working with and without computer composition tools, subtle but important differences to the creative process become apparent due to the effect of the tool. The composer(s) generally use multiple types of representation to build a composition and explore possible changes, with representations requiring interpretation and some degree of improvisation in performance. In contrast software tools generally require completeness of representation at all times, lack the interpretive element and impose restrictions on the form of representation available.

The introduction of a tool in to a creative process has complex effects. In our evaluations composers using software composition tools found unnecessary constraints and an inability to realise their ideas in the representational formats available to them. On the other hand computer tools can free composers from constraints that may previously have held them back, including providing the ability to construct and play compositions individually that would have previously required a band or even an orchestra, and the ability to create sounds and use them in ways that no instrument could support.

Collaborating groups in musical composition use idea representations for feedback, as a memory aid, and also as a means of communication. The use of sketches as shared artefacts in collaborative problem solving is described by Schön [4]. The collaborative / social aspects of composition and other creative activities are essential to the process but at present poorly understood and designed for. Sawyer argues that successful creative groups have *interactional synchronicity*, a shared understanding that allows them to perform better than they would as individuals [3]. The capability to quickly communicate ideas and creative intentions is key to this, and tools that provide an environment for representing ideas could perform an important role in these processes.

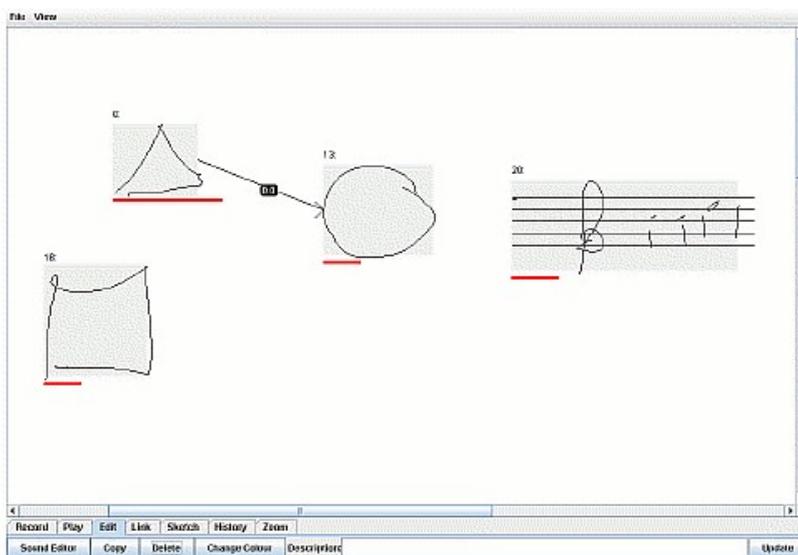
Details of two current design projects based around this research follow:

Sonic Sketchpad

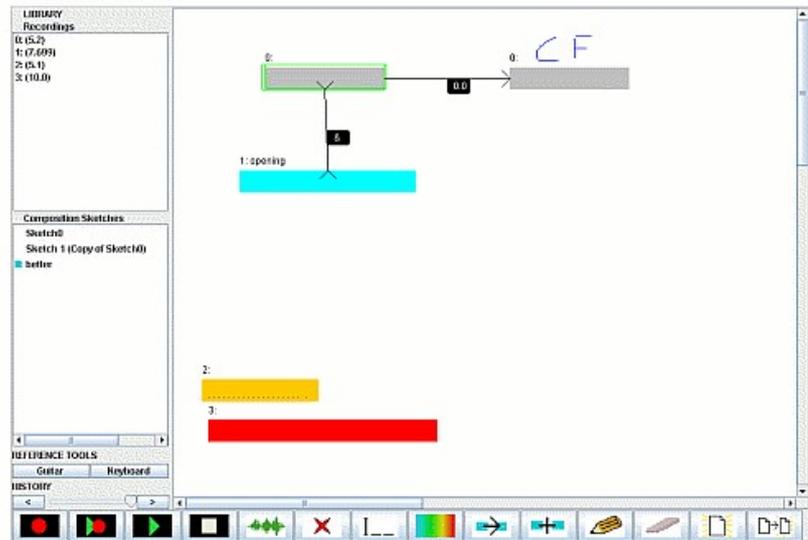
Sonic Sketchpad is a tool designed to aid instrumental musicians in representing, sharing, storing and evaluating their composition ideas. It allows the user to collect recordings along with visual sketches and use them to create composition sketches in a 2D free form space.

Through an iterative development and evaluation approach Sonic Sketchpad provides us with a test bed for the exploration of functionality that could aid the representation, manipulation and evaluation of composition ideas. The original requirements for the tool were produced from an analysis of composers working individually and in co-located groups

unsupported by computer tools, along with the application of relevant creativity research from other domains. The tool has now been through several iterations with changes made based on user comments and observations. Images on the right show two differing designs of the software created and tested so far.



Evaluations of Sonic Sketchpad have highlighted the importance of lowering input costs, for example through the use of a foot pedal to start and stop recording. The composition process commonly occurs over disparate sessions so the system needs to preserve sketches and recordings in a suitable way for reuse. It has also been apparent from the evaluations that collaborating composers prefer to attend to each other rather than the computer whilst developing their ideas at an early stage, but focus on using the system once an idea has reached a level of maturity and they feel a recording should be made and evaluated. Recordings are commonly played and used as backing for the development of new ideas, testing their compatibility in the context of the composition. Evaluations of Sonic Sketchpad allow exploration of when and how composition sketches are useful as shared artefacts, and allow the testing of functionality that may be useful to individual and collaborating composers.



Vocalisations

Vocalisation is defined in this case as the expression of a musical idea using the voice. Examples of vocalisations include whistling or humming but other forms have been observed, for example there may be an attempt to mimic an instrument such as a guitar or drums. Our research found that co-located collaborating composers used vocalisation as a method of communicating ideas when it provides the easiest way to express a single note, melody or rhythm. This may occur if the collaborator has no access or ability to play the instrument in question (e.g a guitarist communicating an idea to a drummer or vice-versa). Similar vocalisations occurred when computer tools were being used collaboratively as a method to externalise ideas before attempts were made to input them. Vocalisation is a form of musical sketching behaviour, commitment to details such as the instrument used or how it is played is not necessary but the idea can be quickly externalised for communication and to gain feedback simply by hearing the idea. Allowing composers to communicate their idea to a computer using vocalisation allows partially-developed ideas to be externalised in a natural way at which point the computer can be used to evaluate alternatives and develop the idea in the context of a composition.

The necessary technology providing conversion from audio to MIDI (allowing the computer to recognise the notes and timing from the vocalisation) is maturing and several applications are available that can perform this task with reasonable accuracy. We are currently studying how this technology could be used through evaluations of software such as AKoff Music Composer [1] with musicians. This has inspired us to explore the feasibility and possible uses of vocalisations as input to a computer composition tool. The results will be used to develop design requirements, and produce a prototype system for evaluation.

Conclusion:

Our research aims to explore the relationships between creativity and technology. Musicians have a long history of using technology and new kinds of relationships between musicians and tools are continually formed as technology progresses. Composers commonly produce visual sketches or notation to describe their work, but beyond that sketching also provides an excellent metaphor for the non-visual representational activities undertaken by musicians that are essential to their creative process. The exploration of sketching as a cross-domain creativity phenomena is therefore central to our study of support for composers and provides a common thread for design-orientated creativity research across domains that needs further exploration.

References:

- [1] Akoff Music Composer, <http://www.akoff.com/music-composer.html>.
- [2] Coughlan, T. & Johnson, P., Interaction in Creative Tasks: Ideation, Representation and Evaluation in Musical Composition. accepted for CHI 2006.
- [3] Sawyer, R. K., Group Creativity: Music, Theatre, Collaboration. Lawrence Erlbaum, NJ, USA, 2003
- [4] Schön, D. A., The Reflective Practitioner, Basic Books, New York, 1983.