A study of contour in music using digital tabletop musical instruments

Andrea Franceschini, Robin Laney, Chris Dobbin
{andrea.franceschini, robin.laney, chris.dobbyn} @ open.ac.uk
The Open University, UK

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This study aims at exploring the role and effects of musical tabletop technology on how people discover and make sense of the concept of contour in music. The study has a largely exploratory approach since the specifics of musical tabletop applications in music education have been sparsely investigated. Nevertheless, digital tabletop applications have been researched for a while now, therefore a good number of methodologies and research approaches exist and have been adapted to this context. This means that, although the specific field is rather unexplored, there are already valuable tools and techniques to gather understanding of the matter in a more structured way compared to a purely exploratory approach.

This study is less strict than a controlled lab experiment but at the same time more structured than an into-the-wild experiment. The reason for not doing a controlled lab experiment is that the aim is partially to explore what the involved phenomena are. The results are expected to give insight into the involved phenomena as well as to provide a set of measurements to substantiate findings obtained through qualitative methods such as interaction analysis and semi-structured interviews.

A tabletop application has been developed specifically for this study. The reason is that, despite the fact that musical applications are among the most popular applications of digital tabletop interaction, surprisingly little of the existing ones could be used to conduct this study, and even those few were hard to obtain. Therefore the application has been designed and developed according to common practices in existing music software: it presents a simplified interface to music composition in the form of a block representing time and pitch as a rectangular grid, similar to piano rolls commonly found in MIDI editors. This grid is used to compose a short phrase, and multiple blocks can be linked together to compose longer phrases. The visual appearance of these blocks is designed to suggest a relationship between the movement of pitch in time and the visual shapes that are commonly used to describe contour concepts.

Participants are asked to use this platform to compose a piece of music that relates to a painting. The task is framed in this way for two reasons: first, contour is often described using visual metaphors, such as ramps, arches, and so on, therefore a painting is a practical way to evaluate how participants discover and use contour to describe visual forms; second, composing music to describe a concrete object is a practical way to give scope to the task and make it feel less like a pure exercise.

At the beginning of the session, the participants' understanding of contour is assessed by asking them to listen to some short melodies and describe them in terms of sections and pitch movement. Subsequently, they are asked to produce an assessment of the painting in terms of form, colour, and organisation of space, as well as to give their own opinion on subject, mood, message, and so on. Information about their music literacy and experience is also collected at this stage in order to gauge their work. After this, participants are allowed to compose music, and then their understanding of contour is assessed again, by asking them to listen and describe the same melodies they have described at the beginning of the session. Since the study is on-going, definitive results are not yet available.

Exploring Contour with DTMIs

Andrea Franceschini
Robin Laney
Chris Dobbyn

The Open University

What is a DTMI?

DTMI stands for Digital Tabletop Musical Instrument

DTMIs allow for **easy manipulation** of complex musical concepts using simple interfaces and gestures.
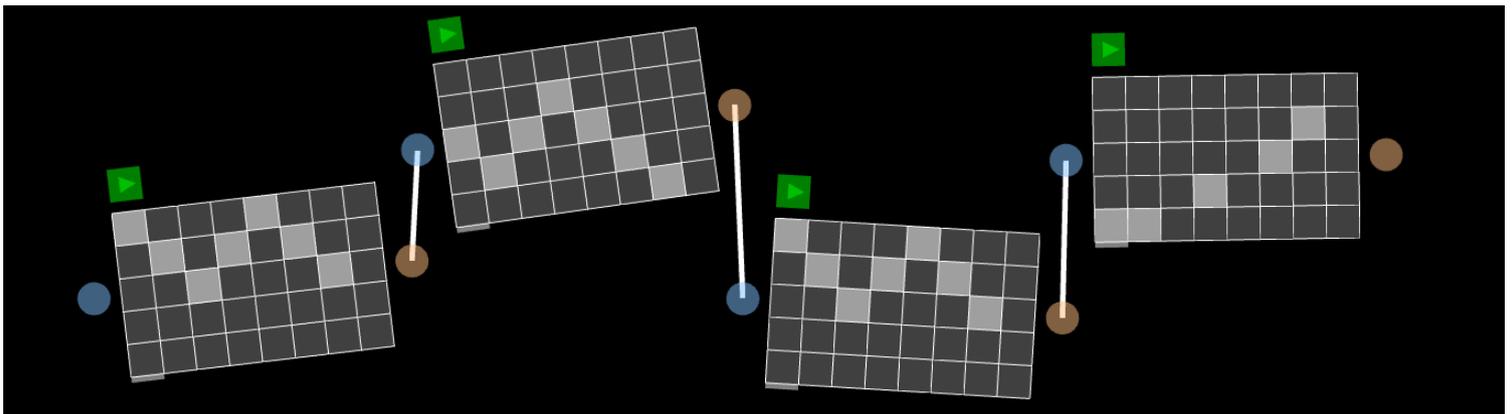
What is contour?

Contour in music is *"the quality of movement of a melody, including nearness or farness of successive pitches"*. †
It is often described in terms of **shapes** that visually resemble pitch movement.

So how do we **explain** and manipulate contour without having to use music notation?

A tabletop musical application to understand contour

This application uses a **simplified music representation**. Music is created by **drawing shapes**. The grids can be connected to create longer melodies, and also rearranged to **manipulate music on a higher level**.

A study of contour

A study involving individuals is on-going, and one involving groups is planned. The idea is to make participants compose music that **relates to a painting**. The painting is chosen with features reminescent of contour. The **aim** is to **associate** visual images and music in an interpretative context.

For more information
http://bit.ly/tabletop-contour