

# Circles and Seeds: Adapting Kpelle ideas about music performance for collaborative Digital Music performance

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## Abstract

The use of free gesture in making music has usually been confined to instruments that use direct mappings between movement and sound space. Here we demonstrate the use of categories of gesture as the basis of musical learning and performance collaboration. These are used in a system that reinterprets the approach to learning through performance that is found in many musical cultures and discussed here through the example of Kpelle music.

## Keywords

Collaboration, Performance, Metaphor, Gesture

## INTRODUCTION

Music is (by and large) a social activity. However, digital music technology, while not antithetical to collaboration has tended to emphasise the development of control by a single person, the composer. A composer may now choose to create music that no acoustic instrument can play and (theoretically at least) is able to specify exactly what is happening at every moment in a piece. But ensemble collaboration in live performance also inspires as well as expressing. This interactive process is a core attribute of creativity that is highly complex and resistant to mechanisation. Traditionally, performance is mediated by systems of metaphor that bring together diverse instrumental resources. Metaphor is also used when people learn to play, communicating both aesthetic values and ideas about how the instrument should be played.

In digital instruments where the sounds are synthesised and are decoupled from any physical form of instrument apart from the loudspeaker there are no concrete affordances that a student masters to play the instrument. The novice may face a *tabula rasa* or unstructured sonic space. The interface is a parameter space. It is a set of knobs and sliders. Exploring and charting this opaque analytic interface is painstaking and because of the abstract or analytic nature of the control parameters it is difficult to encapsulate and communicate the aesthetic qualities that are discovered.

These issues pose several questions. How is it possible to reincorporate collaboration in electronic music ensembles? How does collaboration and ensemble playing relate to learning to play? Is it possible to enrich electronic instru-

ments by sharing knowledge of their characteristics through distributed systems? How is it possible to develop musical ideas embedded within the form of a musical instrument in a meaningful way within an initially unstructured digital medium?

One of the great innovations of digital electronics is networking. There is a metaphor in networking for collaboration. Are there useful views of musical collaboration that we can transfer from collective traditional performance to collaborative electronic performance? As a start we looked at an instance of collective music making non-electronic musical context in which music is acoustic and collective. This is a description by Ruth Stone of the Music of the Kpelle of Liberia [2].

## THE KPELLE OF LIBERIA

For this project the key aspect of Kpelle music is the close link between learning, rehearsal and performance. Kpelle music is conceived as complex ‘bubbles’ in which multiple qualities and elements are negotiated. The ideal is unity through diversity. Stone observes that a Kpelle performance seems to be a free-for-all. However, masters and mistresses of ceremonies oversee extended performances with diversely skilled musicians.

The structure of Kpelle music is coeval with the process of collaborative delegation in performance. Expert Kpelle musicians define musical spaces involving different levels of complexity requiring different levels of skill to play. Novices are given roles that at the simplest level are unchanging-for example the most regular drum beat. Those playing the least variable ‘chorus’ parts start the performance. Additional layers of complexity are added as each part is rehearsed and ‘got down’. Performance emerges from rehearsal and rehearsal is where master musicians bring on novices into performance. These aspects are not separated. Expert musicians control the music through this hierarchical organisation and also through cues that initiate change in aspects of performance, e.g. tempo and rhythm. ‘*The Kpelle consider the sounds themselves to be personified voices and conceive the sounds as combining in terms of social interaction*’ [2]. Kpelle music is an actively constructed process. The learning experience is primary for the novice because the musical function they perform is structural rather than improvisational. It is both simple and important. The narrative created by the expert musicians relies upon the underlying structural integrity the novices provide. As they gain in

skill they transcend the structure to participate in the narrative it underpins. Thus, the Kpelle align performance and learning with the support of complexity by simplicity and the movement of free improvisation over static structure. The balance of this relationship belies the strength of the social, psychological and intellectual purpose it serves. The question we have addressed is whether this powerful set of performance practices be formulated in a way that makes sense in the context of digital music.

## **CIRCLES & SEEDS – METAPHORS OF PERFORMANCE & LEARNING**

The relationship between gesture and expression in music is very important. As well as being intimately associated with the productivity of an instrument, through relating to and manipulating its form, shapes of movement have powerful evocative characters in themselves and offer a number of strong metaphors that link the spatial and temporal domains. Thus, it seems a useful start point to look at the relationship between expression and control in a non-traditional instrument that has the potential for developing a new set of metaphors that will allow control of a synthetic instrument in a natural yet relatively unconstrained fashion. The instrument we have chosen to experiment with is the MIT Media Lab Sensor Chair [1]. The Sensor Chair allows a seated player to move their hands within a free space approximately 600mm x 600mm x 300mm. The movement of the players hands is tracked and converted to a set of  $x,y,z$  coordinates. The chair has been used in a number of performance situations including Penn and Teller and the Brain Opera[1].

In general such instruments have involved direct mappings of control or productivity e.g. Matthew's Radio Baton. This directness is both an advantage and a disadvantage. It is direct, thus typically movement in one axis might be pitch and in another dynamics. Because it is direct it is immediately accessible to the novice. However, directness is also linearity or rigidity and because the space is uncalibrated it is also relatively crude. Interaction is continuous rather than discrete and thus more difficult to control all the time.

The approach we have taken is to bring together the need to overcome the relative imprecision of an uncalibrated space with the attraction of a more subtle or learnable interface and the inherent transparency and content of gestures as a means of communicating between performers and of structuring productivity. This is coupled to passing material from one instrument to another to allow one performer to transform and alter material played by another.

The gesture metaphor we have focussed upon in this first demonstration is the circle. This has the advantage of being simple to execute and yet offering a variety of possibilities of scale, position, speed, distortion (various ellipses, with different declinations, etc.) and direction. Also, circles have powerful metaphorical, properties that include musical associations. The circle is a cycle and cycles of metre, rhythm, pitch or timbre are the vehicle of repetition, variation and development that is so important in making and listening to music.

The system is implemented as a set of MAX patches that receive, classify and use gestures. In the current prototype the gestures are recognised using an ART self-

organising neural network classifier [1]. The circles are used to invoke and control processes that rework a musical seed provided by a keyboard. The chair itself has no inherent productivity, being simply a vehicle for adapting and changing the seed material provided by the keyboard. The gestures are used to control different parameters of the performance. Visual feedback is given for the gesture played. New seed material may be introduced as the performance progresses. As with the Kpelle gestures can also be used to change the musical context: to move from one section, tempo etc., to another. This affects the transformations that may occur.

## **FUTURE WORK**

The future aims of this research are to allow a much greater degree of openness in the interactivity of instruments. One of the most interesting possibilities is that this paradigm will allow a more deeply embedded interaction between instruments that will allow the locus of musical interaction to move away from that between the results of instrument productivity to one of interactivity that is manifest in changes in the structure of an instrument. Traditionally interaction is between musical elements, voices etc that are performed independently. A player plays and then modifies what they play to fit with others. But an essential constraint is that between an instrument and its physical set-up. Violinists cannot play like saxophonists or pianists. The advent of instruments that have no concrete affordances allows a more interactive approach to the definition of an instrument. This idea also finds a resonance in the issues around how complex unstructured analytic control interfaces may be learned and used effectively. The idea that musicians will be able to surf a space of sonic relationships bound together by sets of gestures that form spatial analogies of the control processes they invoke is intuitively appealing. It also allows for the development of approaches that reflect the contextual and hierarchical nature of human motor action and activity in general that seems so strongly aligned to our linguistic and musical abilities.

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