MetaTravels and MetaLonsdale: iPad Apps for Percussive Improvisation

Figure 1: Ensemble Metatone performing with iPads and percussion instruments.

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Abstract
Percussionists are unique among instrumentalists in that their artistic practice is defined by an approach to interaction rather than their instruments. While percussionists are accustomed to exploring non-traditional objects to create music, these objects have yet to encompass touch-screen computing devices to any great extent. The proliferation and popularity of these devices now presents an opportunity to explore their use in combining computer-generated sound together with percussive interaction in a musical ensemble.

This interactivity demonstration presents two iPad-instruments developed in collaboration with Ensemble Metatone, a group formed to explore the "infiltration" of iPad apps into a free-improvisation percussion ensemble. The apps encourage the performers' exploration through percussive gestures and use network features to support cohesive improvisation.

Author Keywords
artistic research; music; expression; multitouch; gesture; percussion; user experience

ACM Classification Keywords
H.5.5 [Sound and Music Computing]: Systems

Figure 2: Rehearsing MetaTravels on iPads alone.

Figure 3: Rehearsing MetaTravels with iPads and percussion setups.

Introduction

Percussion is a musical practice more defined by the methods of interacting with instruments rather than the instruments themselves. Percussionists perform by "striking, scraping, brushing, rubbing, whacking, or crashing any... available object" [5]. These percussive gestures are used to coax wide varieties of timbres and musical gestures from simple instruments. For percussionists, free improvisation is often a process of gestural exploration, discovering new sounds from traditional and non-traditional instruments and responding to other sounds in an ensemble. Like some of the instruments in a modern percussion ensemble, touch-screen computing devices can be struck, scraped and rubbed with fingers and hands. Their percussive affordances, their power to generate computer music and their widespread popularity, motivate an exploration of the use of touch-screen devices in a modern percussion ensemble.

New musical interface designs for touch screen have often focussed on engaging novice or non-musical users [6, 4]. In contrast, the iPad instruments described in this paper were developed to harness the existing exploratory skills of professional percussionists. The musical works that were developed were targeted towards audiences of experimental and contemporary classical music.

The group's rehearsal discussions and audience feedback reveals a highly successful musical exploration with two iPad-instruments, MetaTravels and MetaLonsdale. The performers' percussive backgrounds allowed them to creatively interact with the apps, inventing a vocabulary of gestures that expand the app's capabilities. The network features and unique sounds enabled unique ensemble and individual interactions.

Ensemble Metatone

Ensemble Metatone was brought together to explore the "infiltration" of iPad-based musical instruments into a percussion ensemble through free-improvisation, the only such group in the world. The members of the group, Charles Martin (CM - one of the authors of this paper), Christina Hopgood (CH), Jonathan Griffiths (JG), and Yvonne Lam (YL), had previously studied and worked together as professional musicians. CM was the designer of the iPad instruments and facilitator of the group's rehearsals and performances. Over four studio sessions and four live concerts, two different performance paradigms were explored: in the first paradigm, only iPads were used; in the second, the performers each played a setup which included a number of percussion instruments of their own choosing as well as an iPad.

Our approach for studying the emergence of "expressive interaction" [3] of the performers with the iPad instruments followed common methods for collaboratively developing a musical performance. The process for creating the performance was collaborative amongst all four musicians with free-improvisation leading to collective decisions about stucturing the work both in rehearsal and in performance [2]. The rehearsal process followed Cahn's concept of "Creative Music Making" [1] with a series of freely-improvised performances that were recorded, played back and discussed.

Percussionist Centered Design

For this research, iPads were chosen as the computer instrument in the ensemble. While the field of computer music abounds with creative examples of touch-sensor-based instruments, the goals of this project placed constraints on what could practically be used within the percussion group: the touch-screen devices

Figure 4: Screenshot of the MetaLonsdale app. The green circle denotes the user's touch point while red circles show delayed notes. The delay and auto play functions are controlled by switches on the lower left and the button on the lower right changes the sounds that can be played.

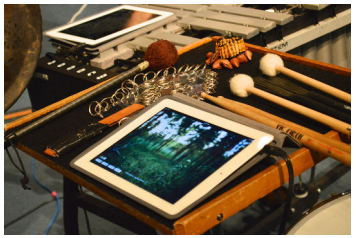

Figure 5: JG's iPad set on a stick tray with a variety of percussion instruments and mallets

needed to be self-contained, durable, and easy to provision with software updates. While the iPad touch screens have drawbacks such as a lack of pressure sensitivity or physical feedback, their physical dimensions mimic that of some simple percussion instruments such as the woodblock or tambourine.

Two apps were produced for the group: MetaTravels and MetaLonsdale (shown in Figure 4), each becoming associated with an improvised musical work of the same name. Both apps used the same percussion-inspired interaction scheme allowing access to pitched percussion sounds and field recordings. The majority of the iPad screen was a performance surface and there were few graphical UI elements. Tapping the screen produced short sounds at a pitch determined by the location of the tap. Swiping triggered continuous field recordings with the velocity of the swipe directly mapped to the volume of the field recording. Both apps featured simple delay functions, that repeat tapped notes, and switchable auto-play features, that algorithmically produced background sounds. These features were activated by switches in the user interface. A button on both apps allowed the performer to shuffle the available sounds. The apps allowed logs of performances to be captured by sending records of each touch event to a server.

MetaTravels

MetaTravels was the first app developed for Ensemble Metatone and featured a sound palette of field recordings from around the world, with chromatically-tuned pitches. The group undertook four iPad-only rehearsals (as shown in Figure 2) with the app and two more rehearsals combining the iPads with percussion instruments (Figure 3). Following this rehearsal series, MetaTravels was premiered as part of the Canberra International Music Festival in May 2013.

The performers in Ensemble Metatone were free to choose their own percussion instruments to complement the iPad app. JG and YL settled on drumset-inspired setups and CM and CH used pitched percussion instruments. While the performers commented that the app afforded less control over sounds than the acoustic instruments, they acknowledged the unique sounds that were available: the field recordings were "something we can't replicate" (JG) and using the repeat function with a fast tapping gesture created, low pitched "organ"-like drones or distinct high pitched sounds.

The ability to shuffle the available sounds randomly contributed to the explorative nature of improvised performance. JG commented that "you have to find a way of making something meaningful with it... that's one of the interesting things about it, finding ways to make it work."

MetaLonsdale

MetaLonsdale was commissioned by David Sequiera for an exhibition opening at Everything Nothing Projects in Canberra. The concept for the work was to perform with everyday sounds of the artistic precinct that surrounds the gallery as well as pitched percussion sounds. Field recordings were gathered from the café and shops surrounding the gallery. In contrast to the chromatic pitches of MetaTravels, diatonic pitches from one of three scales were available in MetaLonsdale. A UI buttom cycled through the scales, changing the pitches available to the performers and incorporating a harmonic progression into the instrument. The work was designed to be performed on iPads alone in the small gallery space and was premiered by CM and CH (see Figure 6).

The MetaLonsdale app included a network feature that automatically searches for other MetaLonsdale instances on a wifi network. Over the course of a performance, the app uses this feature to match the selected scale on each iPad so that the performers' harmonic position in the work is synchronised. This feature also randomly matches the performer's switch settings. For example, if one player switches their delay function on, there's a chance that each other players delay function will switch on as well.

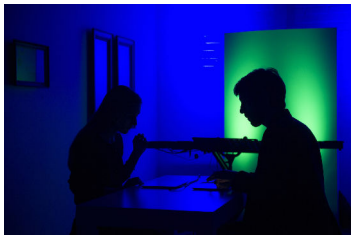

Figure 6: An iPad only performance in duo form at Everything/Nothing Projects.

Audience members commented on the extra cohesion that emerged with this feature, with one mentioning that the network synchronisation "merge(d) improvisitory factors with a harmonic structure that connected the audience to" the performance. The feature also provoked unique ensemble interactions where performers could be "bossy" (CH) - by changing the functionality of others' instruments.

Conclusions

The rehearsal and performance series successfully leveraged the percussionists' expert knowledge to create coherent, improvised musical works with the two iPad apps. YL commented that "we're really developing a sense of... motion. There's definitely parts of it where... we're definitely now in a new section". Even though combining the iPads with percussion setups made them "just another instrument" (CH), the performers revelled in the unique sounds that were available to them. The "textures" (YL) of the field recordings, the "cool harmonies" (JG) of the diatonic tunings, and the surprising "organ" (JG) timbre of low note played with the delay function were all noted by the performers. The network features were particularly effective in producing "cohesive" (CH) improvisation, but also in provoking new "bossy" (CH) ensemble interactions.

Following the premiere performances, the two works were performed as a set by Ensemble Metatone at a public recital in Canberra in August 2013 and at the Electrofringe 2013 festival in Newcastle, Australia.

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