

Exploring the potential of mobile technology for creating music collaboratively

Yeray Real-Delgado, Didac Gil de la Iglesia, Nuno Otero

Department of Media Technology, Linnaeus University, Sweden

yerayrd@student.lnu.se, didac.gil-de-la-iglesia@lnu.se,
nuno.otero@lnu.se

***Abstract.** We will present the first prototype of a framework that supports collaborative music creation activities using short distance-location aware mobile technology. In order to explore the corresponding design space we are planning to run a series of workshops with practitioners to elicit knowledge, find likes and dislikes. Such activities will frame the creation of new features. This is part of a long-term goal to explore how mobile technologies can enable the emergence of ubiquitous music activities.*

1. Framing the idea and creating the first prototype

According to Keller et al. (2011), recent digital technology developments and artistic explorations put the creation of sonic products beyond the traditional frames of learning to play musical instruments and accompanying social practices. Keller et al. (2011) see interactive installations, performance art, eco-composition, co-operative composition, mobile music and network music as instantiations of what they call *ubiquitous music*. Ubiquitous music research intends to investigate the social practices involved in these activities and create new ensembles of artifacts to support them. We believe that this conceptual framework proposed by Keller et al. (2011) is useful for researchers and practitioners alike in order to give full account of the current and emerging music practices.

Considering the domain, collaborative music creation using mobile technology within the ubiquitous music research framing, our research focuses on the following research questions:

- How can relative-position aware mobile technology support collaborative music creation activities, such as mixing and sequencing sounds?
- Which interactions occur when the proposed system is deployed and the users are able to edit, mix and sequence sounds?

During the last months, we have implemented a number of mobile application prototypes with the aim of studying the potential benefits that mobile devices can bring in the field of ubiquitous music. The different prototype versions are the results of iterative software development process that has included co-design phases and users' studies. Currently, the latest version of the mobile application, which will be presented during the event, incorporates interaction choices that reflect the results from our previous studies. Some examples of interaction choices include visualization elements to provide a user's friendly experience, software mechanisms to support collaboration in

a transparent manner and novel usages of emerging communication technologies to provide location context awareness.

More concretely, the current mobile prototype is based on the following technologies; Near Field Communication (NFC) and Multi-Agent System (MAS). NFC is a wireless technology of short-range-communication that enables its user to connect the physical world with the virtual (Want, 2011). This technology is being applied to provide location awareness to the application, and to allow rich interactions based on the specific placement of the mobile devices. In order to support real-time collaboration through the mobile devices, the prototype uses a Multi-Agent System (aka, MAS) framework (Wooldridge, 2002) and recent developments based on previous efforts on mobile collaboration (Gil et al., 2014). The solution allows continuous communication between the mobile devices for coordination and collaboration, which could enable the users to perform individual tasks (e.g., recording audio samples to be used in a music composition, the selection of an instrument to be emulated via the mobile device and personal configuration parameters, such as the device volume) as well as to perform collaborative tasks between the participants in the activity (e.g., defining, for each mobile device, its initial and ending time for playing a sound within the music composition, and providing a tangible interface for discussion the structure of the music composition).

2. Future steps

At this current stage, we have run three user studies with novices in the field of music composition. Through these studies, we have been able to identify a number of features that the combination of connected mobile devices and NFC technologies can provide for music creation and to enrich the learning discussions in such area. We are planning to run workshops with music experts/practitioners with different levels of formal music education in order to explore what features these users judge to be more useful and engaging from an their perspective. We expect that an efficient and engaging system will not only be more readily adopted but will also promote creative outcomes. Our initial results support this statement, and we believe that our current and future efforts will provide stronger evidences of the benefits of our proposed solution.

References

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