

# Spectators of Mobile Musical Interactions: Opportunities and Challenges

**Michael Gurevich**

University of Michigan  
School of Music, Theatre & Dance  
Ann Arbor, MI 48109 USA  
mdgurev@umich.edu

## ABSTRACT

This paper considers the role of the spectator in mobile interactive music and suggests how designing mobile music experiences with broadened notions of spectatorship may give rise to new design opportunities and challenges.

## Author Keywords

Spectator; audience; mobile music; interaction design.

## ACM Classification Keywords

H.5.5 Information interfaces and presentation (e.g., HCI):  
Sound and Music Computing.

## INTRODUCTION

Mobile musical interactions represent a spectrum of activities that take place in a broad range of situated social contexts, which have implications on the meanings of roles that we typically conceive in musical situations. Of particular interest is the role of what I call the spectator: anyone who experiences a musical interaction with a mobile device secondhand.

As a consequence of their portability and constant connectivity, mobile devices rarely foster experiences that are truly solitary—around which there is no element of human-human interaction, whether overt or surreptitious, direct or technologically mediated. If mobile devices can be used anywhere, then anyone can become a spectator at any time: in the grocery store, the bus, the nightclub, the network.

Thus just as untethering computers from bulky boxes and networks from tangled cables changes the nature and possibility of computing, so should liberating electronic music from the laptop or the synthesizer free it from the conventions of the concert hall or the dance club. Mobile devices suggest different kinds of engagement between performers and spectators. Below I describe several features of spectatorship afforded by mobile devices which suggest both novel musical design opportunities and accompanying challenges.

## SPECTATORS ARE EVERYWHERE

Mobile performing (and spectating) does not necessitate dragging around or creating a concert space wherever you go. I've argued elsewhere the essential performativity of everyday interactions with technology, like pouring beer or scanning items at a supermarket checkout [6]. Although we have yet to come to terms with it culturally, a hallmark of mobile computing is its public nature which sets up an inherent performer-spectator relationship, willing or not. A spectator's level of attention is fluid, but when people use technologies in public we are always watching and being watched.

## Opportunities

Although mobile devices already possess the basic technologies necessary for location-based, peer-to-peer interaction (which may be mediated by a network and need not involve literal direct exchange of data), the promise of casual, ad hoc social interaction has yet to be effectively realized. I argue that part of the problem is that interactions of this sort are often conceived as too personal and direct. Digital exchanges with people you eye on the subway make for a good TV commercials, but it is also easy to extrapolate to situations that are undesirable or downright creepy.

Music provides an ideal opportunity for casual, fleeting semi-anonymous social interactions. Furthermore, the mobile world need not and should not depend on the kind of implicit social contract between performers and audiences that exists in the concert hall. Mobile musical experiences can be designed such that spectators can participate with low commitment of time, effort or attention. What would mobile digital busking be?

Perhaps you see me fiddling with a music-making app on the bus. Why can't this be an opportunity for a brief musical encounter? We both have powerful computers in our hands, are both wearing headphones and can easily exchange high-speed data. Whatever the music-making app is, my phone could be broadcasting that my currently musical activity is available for you to tune in, which may in turn link to a library of my recordings or previous sessions.

## Challenges

As with any application that broadcasts your location, privacy and security are primary concerns. An ad hoc music performance/discovery system would need to allow the performer to easily manage the level of personal information that is revealed. Given the current dominance of social media

platforms like Facebook in mediating any online interactions, this is no small challenge. A number of promising mobile applications for sharing and discovery of non-original (i.e., copyrighted) music (e.g., [1, 7]) presumably ran up against the wall of rights management, but perhaps new legal music streaming services like Spotify could reopen that space.

### **SPECTATORS ARE ANYWHERE**

Networks allow spectators to be collocated or remote in physical space relative to performers. Furthermore, at any given time some spectators may be collocated with performers and others may not; distant spectators may be collocated with each other, and others may not.

#### **Opportunities**

Although it may seem obvious that networks can connect people, the particular ability for spectators' locations to be fluid presents a number of design opportunities. Location-aware devices may seek spectators or performers nearby; remote spectatorship can become local participation in a short amount of time. The Ocarina pioneered a way for remote spectators to listen to anonymous performers [8]. As I proposed in *JamSpace*, interactive music systems which promote varying degrees of personal presence and identifiability can lead to rich and diverse social interactions [4].

#### **Challenges**

Privacy is again a concern here, but a number of interesting design challenges also arise when considering applications to support both local and remote interaction. Foremost is dealing with time. Latency is a problem even in the fastest wired networks, so we need to expect and account for it in any mobile networked environment. Can we design musical applications that still feel "live" or "real-time," but can also accommodate some inevitable and indeterminate latency? Loops offer one possibility, in which non-real-time changes can take effect the next time some structure repeats. Other temporal concerns include persistence (If not real-time, how long should actions remain available for spectators in the network?) and interruptibility (How can a spectator join or leave at any time and still have a meaningful experience?).

### **SPECTATORS CAN BE PERFORMERS**

Although a major impetus of the "New Interfaces for Musical Expression" community is to avoid the constraints of the laptop box, standardization does have its benefits: spectators on some level know how it works. Furthermore, the ubiquitous touchscreen mobile phone and tablet offer a richer gestural repertoire and palette of sensing technologies. Years of experience using and seeing others use these gestural devices have inculcated a suite of interactional techniques and paradigms into many of us. Although there is no substitute for embodied musical knowledge, many recent mobile apps have already demonstrated that mobile devices can offer both a low entry fee for novices and complex means for interaction.

#### **Opportunities**

Mobile music designs that employ familiar physical interactions and/or familiar physical metaphors [2] may bridge the gap of spectators' embodied understanding that challenge many novel interfaces [5]. Even if spectators don't understand how an accelerometer works, they generally have

enough experience with other applications as a user or spectator (who hasn't seen or played a Wii game?) that quasi-physical metaphors become meaningful. What's more, the prevalence of relatively uniform physical devices and common channels of distribution also allow a spectator to acquire at least the tools, if not the skills, to become a performer in short order. Mobile devices thus suggest a fluidity of roles along the lines of performer / operator / spectator that Dalsgaard and Hansen describe [3].

#### **Challenges**

The seemingly age-old conflict between a low entry fee and high ceiling on virtuosity [9] is likely to be relevant when casual spectators become involved in a performance. Physical metaphors and physically realistic controls can help make meaning for spectator/performers, but they generally involve necessary simplifications or extreme constraints in order to make musical sense. Limitations on human ability to move repeatably and precisely in free 3D space introduce further impediments to virtuosic performance. Perhaps the most important question therefore becomes not how to ensure that a spectator can become an expert performer, but how they may still have a meaningful participatory experience. Two keys to this challenge lie in addressing the seams as spectators take on different roles, and in giving them the power and choice to manage their level of participation.

### **REFERENCES**

1. Bassoli, A., Moore, J., and Agamanolis, S. tunA: socialising music sharing on the move. In *Consuming Music Together: Social and Collaborative Aspects of Music Consumption Technologies*, K. O'Hara and B. Brown, Eds. 2006, 151–172.
2. Dahl, L., and Wang, G. Sound bounce: Physical metaphors in designing mobile music performance. In *Proc. NIME* (2010).
3. Dalsgaard, P., and Hansen, L. K. Performing perception—staging aesthetics of interaction. *ACM TOCHI* 15, 3 (2008), 13:1–13:33.
4. Gurevich, M. JamSpace: designing a collaborative networked music space for novices. In *Proc. NIME* (2006), 118–123.
5. Gurevich, M., and Fyans, A. Digital musical interactions: Performer-System relationships and their perception by spectators. *Organised Sound* 16, 2 (2011), 166–175.
6. Gurevich, M., Marquez-Borbon, A., and Stapleton, P. Playing with constraints: Stylistic variation with a simple electronic instrument. *Computer Music Journal* 36, 1 (2012), 23–41.
7. Håkansson, M., Rost, M., and Holmquist, L. Gifts from friends and strangers: A study of mobile music sharing. In *Proceedings of ECSCW*, Springer (2007), 311–330.
8. Wang, G. Designing Smule's Ocarina: The iPhone's magic flute. In *Proc. NIME* (2009), 303–307.
9. Wessel, D., and Wright, M. Problems and prospects for intimate musical control of computers. *Computer Music Journal* 26, 3 (2002), 11–22.