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# Music Interaction Research in HCI – Let’s Get the Band Back Together!

Convener:

**Lassi A Liikkanen**

Helsinki Institute for Information  
Technology HIIT, Aalto University,  
PO BOX 19215, FI-00076, Finland  
Lassi.Liikkanen@Aalto.fi

Academic panelists:

**Christopher Amos**

Weill Music Institute at Carnegie  
Hall, 881 Seventh Avenue  
New York, NY 10019, USA  
Camos@carnegiehall.org

**Sally Jo Cunningham**

University of Waikato  
Private Bag 3105  
Hamilton, New Zealand 3240  
Sallyjo@cs.waikato.ac.nz

**J. Stephen Downie**

University of Illinois at Urbana-  
Champaign, 501 E. Daniel Street,  
Champaign, IL 61820, USA  
JDownie@illinois.edu

**David McDonald**

University of Washington  
Suite 370, Mary Gates Hall  
Campus Box 352840, USA  
Seattle, WA 98195  
Ddwmcphd@me.com

**Abstract**

The ubiquity of music consumption is overarching. Statistics for digital music sales, streaming video videos, computer games, and illegal sharing all speak of a huge interest in the content. At the same, an incredible amount of data about every day interactions, sales and use, with music is accumulating through new digital services. However, there is an amazing lack of public knowledge about everyday music interaction. This panel discusses the state of music interaction as a part of digital media research. We consider why music interaction research has become so marginal in HCI and discuss how to revive it. Our two discussion themes are: orientation towards design vs. research in music related R&D, and the question if and how private, big data on music interactions could enlighten our understanding of ubiquitous media culture.

**Author Keywords**

Music; interaction design; cultural studies; privacy; big data; cloud computing; consumer research.

**ACM Classification Keywords**

H.5.5 [Sound and Music Computing]: Methodologies and techniques; J.5 [Arts and Humanities]: Music.

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## Introduction

Consuming music through interactive devices has a great cultural, social and commercial significance. Music technology is an inevitable part of public and commercial space, and also a way of to control experiences in this space [7, 13]. Music interaction is something that many people do every day. Music also moves a considerable amount of money in technology and content business. Music interaction is an important domain of innovation and music related startups had collected 440M USD in investments by October 2011 alone [2].

Despite the general enthusiasm, music interaction as a defined area of research in HCI is extinct. It is not void, but it seems fair to say that we know little about technology used by few and less about the technology used by many. Papers related to music consumption currently appear at HCI conferences at random and a dedicated forum for novel interaction concepts [4] is gone. In contrast, the related fields of new musical interfaces and music information retrieval are doing fine. So what is the matter with music interaction research? Why is music interaction marginal in HCI?

Music interaction research in HCI has a lot to lean on in related domains. Music is an important topic in studies of recommendations. Content-based music recommendations build upon a considerable body of work on *music information retrieval* and a have an annual conference (ISMIR) held for the 12<sup>th</sup> time in 2011 and music has been well present in multimedia information retrieval studies (ACM SIGMIR) as well. In addition to doing fundamental work on system level, people here have established user-centered approaches to evaluate the results of machine learning efforts [9].

Do we know and understand everything worth knowing about music interaction? One could argue that the field of music consumption technology is adequately mature in order to have become uninteresting and transparent. On the other hand, this could be seen all the more reason for researchers to look into how technology mediates our lives, and social structures – to capture snapshots of unique and fleeting historical moments, which cannot be deduced from sales figures alone. However, we do not believe the music technology has achieved its full potential. We see numerous lines of development still unexplored and in need of exploring.

We see that the time to revive the interest of HCI researchers in music is now. The dominant industry players, such as Amazon, Apple, Google, Pandora, Rdio and Spotify, have and will collect immensely more data about music consumption than has ever been possible before. Unfortunately little of this data is public, although it is interesting to many, layman and researchers alike, as demonstrated by users' reactions to recent Spotify-to-Facebook data sharing (cf. [17]).

Music should be seen as a special consumable in media studies. Regarding the work around organizing collections, there are clear parallels to digital photos and videos [5, 8, 16]. But it also has unique characteristics. In the standard use case, listening music is a passive act. From the half a billion of people who have viewed Justin Bieber in YouTube, only a fraction have posted a remix, smash up, or cover version in response. Data of music consumption is not original content such as microblogging entries and status updates, but behavioral information very unique to a person. Music listening also produces data in quantities difficult to create by intentional effort.



Figure 1. The role materiality and sociality in digital music consumption. Illustration by Nurri Kim, used with permission.



Figure 2. A visual analogy of an analog Braun T3 pocket radio and the dominant design of 2010 for mobile music, Apple's iPod. Photo from <http://gizmodo.com/343641/1960s-braun-products-hold-the-secrets-to-apples-future>

## Themes of panel discussion

The themes we discuss in the panel concern the *music consumption data* currently possessed by the commercial players and the balance of *research vs. design* driven innovation in music devices and services.

### *Demanding access to big data*

Accurate information about what music you listen to has been largely unavailable until now, but is valuable in many ways. Recent studies show how music listening history correlates with personality [10]. Information about music consumption is important for marketing purposes and even consumers themselves take interest in tracking their consumption, as witnessed by the popularity of services such as Last.FM Scrobbler and SoundTracking which let users explore their listening history logs. Some people might consider this type of information sensitive and be concerned about sharing it [17]. More importantly, the wealth of the data is just emerging. Cloud music services, particularly those following the concept of iTunes Match, will enable user data collection like anything before. This can happen effortlessly, unlike with currently apps that require special loggers. Ambient and ubiquitous sensors, even those included in a smart phone, would allow creating an even more data about digital music consumption.

The question is, who should own your listening data? What should they use it for? How can we facilitate access to this data for scientific purposes? How should we handle it? These questions are clearly not unique to music, but involve every other media as well, but we believe they might first emerge with music. As an example, Spotify's recent Facebook integration was quickly followed by a new privacy feature [3], as would have been predicted by research [17].

### *Design driven domain*

Second discussion theme is the balance in orientation towards *design vs. research* in music related R&D. Despite its digital nature, modern music consumption is still highly material, technologically mediated activity (Fig. 1). Music is tied to devices and services provided. The music technology enables and facilitates our music experiences. And it must be designed.

The R&D efforts related music interaction are heavy on design. They do not seem to base on research-based insights. Interface solutions for music interaction display an interesting evolution from the analog era to today. Reliance on old interaction metaphors can be good for learning, but less so for inventiveness. The dominant design for mobile music consumption that has become to label the whole field is iPod (78% market share with 300M units sold [1]). The visual design of iPod is based on a model of a portable FM radio (Fig.2). Bit similar situation for desktop applications. iTunes is about to reach Windows Media Player in popularity, both offering an interface concept invented in 90's. If it was not for the successful machine learning approaches to deliver content-based recommendations (Genius, Pandora), progress in music interfaces would be stalled.

Is there something wrong with the design driven approach? We don't believe that traditional methods of user-centered design are the answer [14]. Instead we see that the field would advance better if design organizations would share their lessons learned from experimental and commercialized systems. Nokia Research Center has exceptionally published multiple papers about their music studies [6, 11]. We encourage others to follow or outsource the task to academics.

## Conclusion: Expectations for the future

The goal of the panel is to raise awareness about a topic that has existed in the margins of HCI research for a long time. We want to find new ways for research collaboration between different stakeholders of digital music world. We hope to encourage students and scholars to explore new research questions in sociology, anthropology, psychology, and futures research that relate to music technology – a world currently driven by design interests. We believe this panel helps the HCI community in orchestrating future activities, such as SIGs, workshops, and paper sessions, relate to media consumption and interaction, particularly around music (see <http://tinyurl.com/musicix>). We look for the future to have interesting implications for cultural, historical and design studies. This might accurately portray the profiles of music consumption, find the most important and satisfying mechanisms of discovery and everyday use of music, support discovery through completely new kind of interaction concepts (bodily, social, virtual, contextual). The questions should go beyond the themes of this panel, e.g. music in social networks [15] or in virtual economies.

We also hope to challenge the companies to collaborate with academia to write a new chapter in the book of cultural history. Reciprocally academia should do work that helps companies to create products that provide better user experiences with music. To achieve this, our panel consists of people working on music interaction from industry and academia. The session involves audience interaction using Presemo platform for interactive presentations through a standard WWW interface [12] to inspire the discussion.

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