
UbiComp '13 SenCity Workshop: Sensing Festivals as Cities

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Abstract

In order to sense the mood of a city, we propose first looking at festivals. In festivals such as Glastonbury or Burning Man we see temporary cities where the inhabitants are engaged afresh with their environment and each other. Our position is that not only are there direct equivalences between larger festivals and cities, but in festivals the phenomena are often exaggerated, and the driving impulses often exploratory. These characteristics well suit research into sensing and intervening in the urban experience. To this end, we have built a corpus of sensor and social media data around a 18,000 attendee music festival and are developing ways of analysing and communicating it.

Festivals as Cities

Festivals are temporary sites constructed around the cultural activities that they host. At their largest they can be viewed as temporary cities, serving populations of ~50k at Burning Man (USA) [1] and 150k at Glastonbury (UK) [2] for durations of up to a week.

Cities and festivals are notable as being where friends of friends are never far away, where the culture brings out groupings in space and time, and where the experience of being amongst others is transformative to your enjoyment of the occasion. Moreover we suggest that human activity often has an exaggerated



Figures (1) and (2): Our prototype 'app' that provides festival information and offers the opportunity to opt-in to features built around our research. ©Matthew Tobias Harris

quality at festivals, seen both in the vigour of the basics such as traveling through the site, and in the kinds of activities encountered, such as dancing or outdoor games. This heightening of phenomena should provide a better training ground for sensing and classification technologies.

Festival attendees are outside of their daily routines and we suggest they often treat festivals as a 'bubble' away from the on-going concerns of their day-to-day lives. This temporary re-configuration of priorities and bounds could provide a situation for exploration of experimental systems that in might otherwise be rejected — for instance issues around privacy may be perceived quite differently for a weekend festival as opposed to life in your home city. Part of that is the limited, clearly bounded duration, and part of that is what culture specific to the festival.

We view the possibilities of smartphone applications as a key enabler of research in this field. Smartphone hardware can be a capable sensor and network platform in the personal ownership of potential participants. Smartphone applications provide an opportunity to recruit and engage with participants. The opportunity is to conduct studies at scale, with thousands of participants.

To recruit significant numbers of festival attendees, our strategy is to partner with festival promoters and to provide them and their attendees with a sufficiently attractive smartphone app (Figures 1 & 2). Our festival app is designed to be serve the basic informational needs such as timetable, map, live updates etc. in a sufficiently appealing manner for uptake by the attendees. On use, there will then be the option to opt-

in to further functionality that serves our research objectives — and, hopefully, them.

Our position is that festivals are exceptional sites to study the interplay of human activity and constructed environment. They share many of the interesting characteristics of cities while being free from the constraints and attenuation inherent in day-to-day life. We propose that in order to to sense cities and uncover their hidden dynamics, it would be best to study festivals first.

Related work

Ganti et al. give the goal of crowd-sensing as the measurement and mapping of phenomena of common interest, and the technique as individuals sharing information obtained by their personal devices [3]. Our focus is crowd-sensing using smartphones in the context of festivals.

CenceMe is an early example of such a crowd-sensing application, taking the idea that status updates from individuals to social network sites could be automatically generated by their personal devices [3]. Miluzzo et al. developed a technique of generating these updates through opportunistic sensing and human activity classifiers. Further to these individual status updates a daily summary was generated, some of whose terms relate to the social group, ie. 'party animal'. These individual updates became crowd-sensing through CenceMe's embrace of social media such as Facebook and its own online community portal. More recent research such as EmotionSense [4] and SociableSense [5] develop the techniques of opportunistic sensing using smartphones with the goal

of detecting and staging interventions around individual's emotion and social interaction.

Working with the crowd as a whole, Kjærgaard et al. [6] used the fusion of sensors in mobile phones to detect flocking behaviour (groups of people moving together) of pedestrians. Video data was used by Silverberg et al. to detect and then predict the collective motion of 'moshers' at heavy-metal concerts [7]. Larsen et al. produced real-time visualisations and models of micro-groups within a festival by detecting when attendee's devices were in range of sensing stations around the festival site [8]. From this topography of attendee groupings and festival programming participants' musical preferences could be inferred.

These topographies of crowds and environments — or the data generating them — are often visualised in terms of the geography of the site. This is not the only approach however, with projects such as Graffito [9] and 'Hide & Seek' [10] exploring the visualisation of data gained through smartphone applications designed to engender crowd-based performative interaction and gaming at festivals.

Studying the dynamics of a festival

We are engaged in a research programme to explore the opportunity and techniques outlined so far in three broad stages. First, we are studying the sensing potential at festivals such that we can extract salient information to build a topography of human activity within the festival site. Second, rather than logging the sensorial data for subsequent analysis we need to develop these techniques to operate in real-time during the festival itself. Third, with this real-time informatics operational we can then stage interventions designed

with goals such as testing hypotheses of human interaction, enhancing the attendee to attendee experience, facilitate performer-audience interaction, or to serve the organisers' promotion or logistic needs.

We are currently at the analysis stage having carried out two data gathering exercises on festival audiences - one at a macro scale by harvesting Twitter data and the other at the micro scale by deploying confederate audience members with equipment to log sensorial data.

The 'macro' dataset was gathered by running a server over the duration of Field Day festival 2012 [11] that ingested all tweets with with hashtags related to the festival and it's programmed acts.

The 'micro' dataset was gathered by seven confederates attending Field Day 2013 who carried prepared smartphones. These smartphones were LG Nexus 4 and Samsung Galaxy II devices running the Android 4 operating system and an iteration of the 'festival app' we are developing as part of this research programme. The app captures, logs and uploads data from all sensors made available via the Android Sensor API, along with recurring scans of WiFi and Bluetooth IDs and strengths. We ran the app from 5pm until the festival's close at 11pm.

Discussion

Swan describes the crowd-sensing paradigm discussed in this paper as a sequence of ecosystem layers: data acquisition (sensor platforms) leads to information creation (software processing) leads to meaning making (information visualisation) until we ultimately are action taking (creating interventions) [12]. She also

points out that at this time, all layers in the ecosystem up to the information visualisation are developed, leaving the “so what?” challenging action-taking layer to be further researched, as these kinds of data-flows are completely new. We agree, and this is where we hope to make a distinctive contribution.

On a prosaic level, festivals afford us a number of easily matched problems and possible interventions. For instance overcrowded or under-attended performances could easily be detected and recommender systems implemented. Detecting under-attended performances with excited attendees could then better inform such recommenders.

It is the ‘bubble’ character of festivals which we think will be most productive however, as it allows us to iteratively experiment with notions of privacy and buy-in from attendees. As we are attempting this research ‘in the wild’, we are directly impacted by our app being sufficiently attractive to use, and our ability to sufficiently mitigate any consequences of opportunistic sensing or personal data sharing.

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