

Tejp: Ubiquitous Computing as Expressive Means of Personalising Public Space

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ABSTRACT

We present the project Tejp, which aims at exploring the potential of ubiquitous computing as an expressive means of personalising public space. The project consists of a series of experiments in which users deploy open low-tech prototypes in urban settings to create layers of personal information and meaning in public space through the parasiting of physical environments. Focusing the experiments on the aspect of physical interaction, we observe how emerging information content and user behaviours are influenced by the characteristics of the prototypes. This will result in design implications that will allow for a heightened degree of poetry and personal expression in ubiquitous computing.

Keywords

expressive ubiquitous computing, personalisation of public space, parasiting of physical environment, détournement

INTRODUCTION

How can people create their own ubiquitous computing infrastructures to deploy in the everyday environment, in order to make it more personal, meaningful and expressive? The project *Tejp* addresses this question by experimenting with technology-enabled layering of personal, location-based information on public space, enabling people to overlay as well as uncover personal meaning in their physical environment.

The project is a testing platform geared towards providing opportunity for open customisation and creation of ubicomp environments invested with personal meaning. It focuses on exploring the actual physical interaction between the users and the information space. Attention is also directed on the resulting content given to a physical place through this interaction. Avoiding imposing formulated content or fixed interaction procedures, we aim at allowing personal aesthetics, possible strangeness and poetry to emerge.

In order to achieve this, we develop a series of various low-tech prototypes to deploy in urban environments simply to see what will naturally occur. These prototypes are not meant to become end-products, instead we use them as concept illustrators and props for experimenting with people in real-life settings, in order to observe emerging content, behaviour, narratives and meaning.

More specifically, these prototypes allow us to explore how their characteristics and physical attributes influence the way people appropriate and personalise space through interacting with them. As a result, each of the prototypes consists of different combinations of media, structure and level of abstraction, while deliberately remaining straightforward and open.

PRELIMINARY STUDY

At the start of the project, we performed a preliminary study of urban visual cultures and interviews of public artists in order to gain insight into the aesthetics, the values and the acceptance of current alternative forms of communication and personalisation of public space, such as stickering and recent forms of graffiti. The study revealed current tendencies towards the discrete use of context and ephemeral situations into the pieces, an approach that is more widely accepted by the general public than other more classic forms of graffiti. This prompted us toward the importance of physically incorporating the information space to its local context and led us to basing parts of the design of the prototypes on the idea of *parasiting* physical environments.

The concept of “parasitic media” introduced by Johnson [5] is further developed and refined by Martin [6] as “adding functionality to a pre-existing system (...) [and making] use of only that which you create which in turn remains invisible” and stays “within the system margin of error.” Whereas parasitic media mainly focuses on mainstream media and corporate network systems, our approach to parasiting occurs on the level of the physical environment, where the prototypes re-use existing elements of physical environments or situations in public space as an intrinsic part of their functionality, while still maintaining a discrete presence.

We were also inspired by Situationist ideas of intervention in everyday life, in particular that of *détournement*, defined as “deflection, diversion, misappropriation, hijacking, or

otherwise turning aside from the normal course or purpose” [1], which is usually used as a critique of the information content pervading public space in many examples we encountered during our study.

PROTOTYPES

We describe *Audio Tags* and *Glitch* as first examples of the types of prototypes we develop and experiment with in this project.

Audio Tags

Audio tags illustrate the notion of *overlaying* personal traces on public space. An audio tag contains an audio message that once recorded can be left at hidden places in public spaces. When passers-by lean towards the device, this personal message is whispered to their ears. People then have the possibility to record over the existing messages with their own.

The prototypes are made from hacked low-cost gadgets and are about a few cm³ big. They consist of a small microphone through which an up to 10 seconds long audio message can be recorded onto a small sample buffer while holding a button, and a small speaker that reveals the content of the message when an IR sensor senses the proximity of a person (Fig. 1). After recording their message, people can attach the tags to walls or other structures in public space.

Virtual annotations of space have been explored by several projects, such as GeoNotes [3] in which location-specific text annotations on public space authored by the users themselves are browsed through with PDAs. In its approach to augmenting public space with location-based audio, the Audio Tag experiment is also related to projects like Augment-able Reality [7] in which virtual voice notes and photographs are accessible through an augmented reality wearable system, and Hear&There [8] where personal audio imprints are virtually linked to physical locations.

In the case of Audio Tags, we were interested in exploring physical rather than virtual interaction with the audio space in order for people not to need any particular device to access the information and for the audio to be better integrated in the public space. The Voice Boxes [4] that record personal audio message when opened are in this way similar to our experiment. However, while users of the Voices Boxes trigger the messages by manipulating the devices, the Audio Tag messages are triggered by physical proximity, in a implicit way. By being fixed on physical structures in the environment as parasites and by only making themselves discretely heard within a certain radius, as when whispering to someone, the tags open a space of intimacy inside the public realm. This proximity triggering combined with the small size of the tags that makes them almost disappear into the environment, helps ensure a serendipitous discovery.

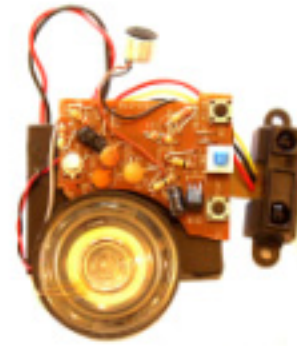


Figure 1: Audio tags: adding a layer of personal audio on physical structures

Glitch

As opposed to overlaying information, Glitch is about *revealing* a hidden layer of personal communication in public space. Interferences caused by passers-by’s messages and phone calls, are loudly broadcasted at a public place with high traffic potential, such as bus stops or busy street corners. If the speaker array is f. ex. linearly disposed along a usual pedestrian path, the glitches stalk the mobile user during the whole phase of mobile communication initiation (Fig. 2).

The Glitch prototypes are arrays of powered-on loudspeakers picking up electromagnetic interferences from mobile phones. Some of them use a standard antenna and can be installed in a grid formation, while others parasite off existing metallic urban structures such as fences or trash cans in the city, re-using them as antennas in parasitic way.

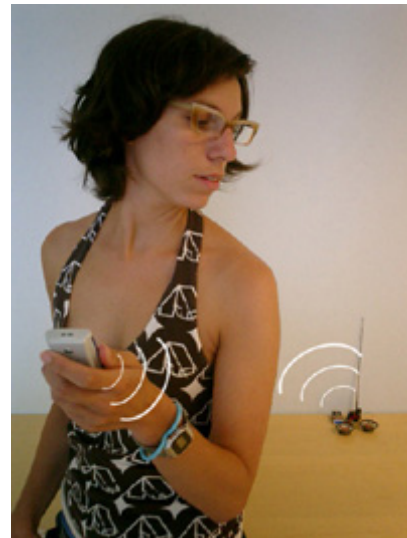


Figure 2: Glitch: revealing a layer of meaning by re-situating familiar phenomenas into unusual settings.

Earlier projects such as Live Wire [9] and Placebo [2] also make otherwise hidden communication networks visible in a way integrated into everyday contexts, respectively with wires dangling to the amount of activity in a computer

network, and furnitures reacting to electromagnetic fields produced by mobile phones or other leaking electronic objects. A more recent example of this is WiFisense [10], a handbag covered with light diodes that light up when detecting wireless networks.

Glitch, on the other hand, follows the situationsist tactic of *détournement* [1], by re-situating the familiar auditory phenomena of speakers picking-up incoming calls or text messages before the mobile phone does, usually taking place at homes or offices, into the unexpected setting of outdoor urban environments. As the nature and origin of the noises are familiar to most people and easily identifiable, the speakers remain hidden, a situation of interruption is created, highlighting the virtual and pervasive layer of mobile phones communication. Moreover, Glitch differs from the previously named projects by its parasitic nature.

OUTCOME

Our hope is that through the accidental collaboration of various actors in the public realm, the project will result in physical networks of meaning, aesthetics and perhaps a critique of the everyday environment. The Tejp prototypes are tested on site through specifically crafted tactics and placement. Testing procedures and experiments range from outdoors workshops, to stake-outs and video-based analysis. Once having experimented with users in real urban settings, we will derive informed design implications based upon reoccurring patterns of people's (mis)use of the prototypes and emerging narratives, both from the perspective of active and accidental participants within the project. This implies observing changing content, placement, modes of initiation and interaction behaviours. Based on these design implications, we will be able to draw conclusions for and about expressive ubiquitous computing environments.

CONCLUSION

We have presented the project Tejp, which is a step towards a more poetic, strange, and personal expression in ubiquitous computing. Tejp explores how to empower people with open pervasive means of structuring and personalising their everyday environment through overlaying and uncovering meaning on public, physical space. Besides the two examples we have described, we

will be experimenting with a series of other low-tech prototypes, resulting in informed design implications for this field.

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