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Urban space as a large-scale group playground

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ABSTRACT
In this paper, I describe CitiTag, a research project aiming to explore the potential of spontaneous social behaviour and playful group interaction in public spaces through the use of mobile technologies. I discuss briefly the idea and motivating themes, the design of CitiTag, a wireless location based multiplayer game and findings from two user studies.

Keywords
Mobile computing, social computing, presence awareness, wireless location based games, multiplayer games

1. INTRODUCTION
The uptake of mobile technologies has undoubtedly been changing our communication practices and affecting our everyday life patterns. A key concept in this work is p*resence awareness*, which is knowing or being aware of other people's existence, for example whether one's friends and colleagues are online or not. With the advent of mobile technologies, presence becomes a richer concept as well as more ubiquitous, integrating virtual presence with physical presence through location information.

New opportunities emerge for individuals and groups to communicate and coordinate their activities spontaneously in urban environments. Rheingold's discussion of *Smart Mobs* [2] highlights the overwhelming power of social cohesiveness that can be brought about by knowledge of the presence and location of others in both real and virtual spaces. We also know that wirelessly internetworked groups of humans can exhibit emergent prediction capabilities [2] and thus demonstrate self-organizing dynamics.

Our work is motivated by the idea that the presence awareness of many other people can enhance the 'feel good' factor of being part of a large group and thereby afford spontaneous interactions. Previous online studies [3] have shown that spontaneous social behaviours can 'emerge' among groups present in multi-user environments, even without explicit and verbal communication. The recent Flash Mobs phenomenon illustrated that people do not hesitate to perform certain acts in public together with many others, which otherwise would have

been quite embarrassing. In fact, people participating in those events seemed very engaged and amused.

These acts of spontaneous play have been thought-provoking within the context of our research. Play has been inherently social, before the advent of communication technologies, as we see everyday on school playgrounds. Presence enabled technologies create new prospects for play, for adults as well. In our research these are the boundaries we explore: what kind of engaging social experiences can emerge in the real world based on the awareness of individuals participating in a parallel virtual experience? Does virtual presence penetrate physical presence in any way?

2. THE CONCEPT
The 'CitiTag' project is focused on social experiences and group play in public spaces, based on the awareness of other peoples' presence, through the use of mobile technology.

Our CitiTag game has been inspired by the simplicity, spontaneity and instant fun of 'playground tag' [1]. We have further developed the 'tag' concept to encourage emergent social behaviours in an urban context. City space is used as a playground and passers-by can become the usual or unusual suspects in a novel experience.

3. DESIGN
CitiTag is a multiplayer, wireless location-based game, played using GPS (Global Positioning System) and handheld, iPaq PocketPCs connected to a wireless network. The game has been designed for many people, potentially as an everyday experience one could have in the future with a mobile phone while walking about in a city centre. As a player of CitiTag, you belong to either of two teams (Reds or Greens) and you roam the city, trying to find players from the opposite team to 'tag'. You get the opportunity to 'tag' someone when you get close to them. You can also get 'tagged' if someone from the opposite team gets close to you. If this happens, you need to try and find a team member in the vicinity to set you free, to 'untag' you.

Each game event (e.g, someone is close and you can tag/untag them) appears as an alert on the iPaq screen with a sound (Figure 1). The player can then tap the screen to respond to the event.

The project is motivated by the hypothesis that very simple game rules based on presence states (e.g. I am Green and 'tagged') can result in an enjoyable social experience, stimulated by real world interaction among players. Another hypothesis is that certain interactions may 'emerge' once a critical mass of users has been achieved, making the experience different every time as it is stirred by group dynamics.

Figure 1. Game screens: default, you got tagged, rescue a friend

4. USER EXPERIENCE STUDIES

We have carried out two user trials: a pilot trial with 9 participants in an open field space at the Open University campus in Milton Keynes and a trial with 16 participants in a square in the city centre of Bristol (Figure 2). These were followed by group interviews, in addition to which all participants completed a questionnaire about their experience with CitiTag. Our observations are described next.

4.1 'Emergent' behaviours

Participant interaction in both events was particularly interesting as various emergent tactics were displayed: using gestures to attract attention from a distance, following others secretly or running, trying to surround a person in pairs, hiding and waiting for passers by, and other similar ones. In the Bristol trial there was an 'assassin', a player who cheated by joining the opposite team and then switched back to the original at the very last minute to 'tag' as many people as possible whilst being among them. There was also an 'invincible pair', two players who just went along together to tag others and kept rescuing each other, without having verbally agreed to collaborate beforehand.

Figure 2. User trial in the centre of Bristol

4.2 Presence awareness

Our participants in both trials valued the group state awareness features of the game and expressed their wish for more awareness features in a future version of the game, particularly more audio cues and variable levels of proximity alerts when someone is close, but not yet 'taggable'. Many participants also wanted to be able to see more people in the vicinity on their screens, including members of their own team. In the Bristol trial, the awareness of the presence of other players was correlated with how much our participants enjoyed the game as well as with how engaged they felt. This is an indication that in physical technology mediated games like CitiTag, immersion in play is associated with real people around rather than with interaction through a game screen as in most computer games. This in fact endorses the principles of the lightweight design of CitiTag, which reveals one aspect of someone's presence (a name of a person within 10 meters or so) but without making everything too explicit (the person's actual location on a map).

4.3 Experience and everyday life

Participants discussed various scenarios in which they could play CitiTag, for example as part of a timed event, a gathering with friends outdoors, an opportunity to form groups/clans and socialize. In our pilot trial people needed an appropriate location to play the game, a city landscape, rather than an open field where players are constantly exposed. In the Bristol trial the location was more appropriate for the game and a couple of participants suggested specific city locations, such as pedestrian areas in Bristol with more places to hide, where they would like to play CitiTag.

5. FURTHER WORK

The trials have provided extensive feedback on the conceptual design of the game as well as the user interface to allow us to design the next, more advanced version of the game. With CitiTag we aim to identify design implications for future technology mediated social experiences.

6. ACKNOWLEDGMENTS

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