Smart Cities as a Playground: the case of Crisis Training

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Abstract. Learning from experience in the crisis management field is challenging as crisis work is scattered in time and space. Based on our experience, we suggest that being able to create for training the same engagement with the territory created by pervasive games can result in a better understanding of the city and thus in a better training.

1 Introduction

Crisis management is a complex discipline where teamwork, coordination, strategy, and self-understanding are important. Failing to perform the right tasks or passing the right information at the right moment can cause important losses in term of lives. In addition, most of the necessary learning process couldn't be achieved reading books about procedures but should be based on real life experience. However, learning from experience in this particular field is challenging as crisis work is scattered in time and space. Because of crisis intrinsically sporadic and scattered nature trainings in the crisis management field have been supported also through real life simulations trying to reproduce as much as possible real life situations to teach best practices. While for crisis workers acting in an actual emergency the city is some kind of "battleground", for the same workers training during a simulation the city is more a playground (i.e., a ground for *trial and errors* actions). Real life simulations are however very costly - as they require a large deployment of personnel and equipment - and implicate sometimes the impossibility to train in high populated areas. For this reason, computer based simulations (e.g. [1],[2]) and even serious games (for a full review see [3]) have been proposed to facilitate training. In recent years we have seen a (similar but opposite) way to inhabit the urban space as groups of people started to enliven the city as a playground (intended here as a physical sphere of pleasurable activity). For example advocates of pervasive gaming [4] have translate the gameplay and rules of existing games to enact them in the city using as support new technologies. The main fascination of this kind of games is the fact that when you walk down the street, you're walking through an adventure world draped on top of the real world, and people you meet may be characters in the same game you're playing. On the same veins, the rather apolitical phenomenon of Flash Mobs, characterized by remarkably low-tech coordination (email lists and on-the-spot handouts) illustrated that people do not hesitate to perform certain acts in public together with many others, which otherwise would have been quite embarrassing[5]. In both the above mentioned cases the city is

adfa, p. 1, 2011.

the playground where, socially, normal citizens can interact in a playful way. It's our opinion that being able to create the same engagement with the territory in crisis training can result in a better understanding of the city and its inhabitants and thus in a better training. For this reason our current stream of researches revolves around the question: **How can we configure the city as a playground for training situations, in order to enhance interaction with and understanding of the urban space?**

2 Origins of the fascination for pervasive games

For this paper we will adopt the definition of pervasive games as those games that blur the boundaries between the game world and the real world [6]. In particular we will look at the role of video games in blurring those boundaries. In *Qu'est ce que le Virtuel* [7], Pierre Levy points out that the *virtual* (world) stands in opposition not to the *real* but to the *actual* (or *physical*) world. The *virtual* is just as real as the *physical* is. Thanks to recent technologies the interplay between actual (or "offline") and virtual (or "online") worlds is becoming more and more common and seamless [8]. In our opinion this is one of the reasons why gravitating around the term pervasiveness are the "old" LARPs (live action role-playing games), but also ubiquitous and pervasive technologies, as well as mobile and mixed reality games. A LARP is a form of role-playing game - inspired by tabletop role-playing games and genre fiction like the Clue board game or Masquerade - where the participants physically act out their characters' actions. In addition to entertainment and artistic merit LARP events may be designed for educational or political purposes. For example, the Danish secondary school *Østerskov Efterskole* uses LARP to teach most of its classes [9]. Language classes can be taught by immersing students in a role-playing scenario [10] and politically themed LARP events may attempt to awaken or shape political thinking within a culture [11]. Starting from this common background technologically augmented location-based games are now played in everyday places. In this kind of game, game information is tied directly to locations [12]. One example of location based games is Geocaching, in which the participants use a Global Positioning System (GPS) receiver or mobile device and other navigational techniques to hide and seek containers, called "geocaches" or "caches", anywhere in the world. One interesting "serious" example of this kind of game is Floracaching [13] where the treasures are real plants. On the same veins, the projects *Can You See Me Now?* [14] and *Uncle Roy All Around You*[15] use handheld, digital devices, GPS location tracking, and on-line agent technology in the attempt to use location and mobility as game features of the real world. Finally, interesting examples of technology augmented serious pervasive games are the Piano Stairs experiment, commissioned by Wolkswagen, and the more structured Ewoke[16], an alternate reality game commissioned by the World Bank. In the first case the action in the city is more occasional, while in the second it involves the participants for several weeks. As we can see, in all these games there is a certain kind of *tension*, between the technological, the social, and the gaming aspects which generates different kind of *discourses* depending on the aspect taken into account when interacting with the city.

3 Using Pervasive Games to Train Citizens and Crisis Workers

To understand the effects of pervasive serious games for crisis management over the city and the linked training, in the last 2 years we conceived and developed 2 mobile augmented games. The first one is called MoDo and targets emergency workers. MoDo [17] is structured to be played in teams in an augmented physical environment so that sensible areas in the city - or smaller zones as a building - can be used for training. The game is played through mobile devices and technology-augmented objects. Each team has to complete its mission, to evacuate people inside a zone, before the other team does. This means that the teams have a limited amount of time to complete their missions using the resources (such as augmented hammers, chains, and the like) they are provided with. Apart from learning considerations, evaluating this game raised some interesting reflection about weather conditions when training and how it affects technological usage. As some participants had to test the prototype under bad weather conditions the game maps (i.e., the part of the environment they were interacting with) had to be balanced as slippery road would have put players in danger [18]. The second game is a serious game for promoting citizens' preparedness to flooding situations, called Flooded [19]. Flooded is a location-based mobile game to be played in the player's local territory. The players move in the real world with the support of its virtual representation through Google maps. In the map the players can see their own position, game objects, and the position of other players. The game is composed of three different phases. The first phase represents the time just before a flooding, the central phase depicts when the flood is hitting, while the final phase represents the time after the flood has hit. The players will have to help predicting and managing the flood before it hits, can see what happens when a flood occurs, and then they will have to act in the flooded area. Results of the evaluations show that the game was successful in promoting flood awareness, especially in terms of increasing the player's knowledge of the local territory. The feedbacks from the players suggest that the game was highly successful in creating an engaging experience and the most interesting and engaging aspect for the players was the location-based aspect.

4 Issues for discussion at the workshop

Basing on these two games experience, at the workshop we are interested in discussing issues connected to the usage of pervasive games in a city context. In particular we are interested in issues linked to:

Learning. Create a training through pervasive games raises issues linked to which kind of learning elements are most suited for this kind of approach. E.g. it's better to teach procedures or soft skills through pervasive games? How can we measure the effectiveness or effect of pervasive technology for learning in serious games?

ICT usage for pervasiveness. How to design the gaming experiences in the city is a critical element and it involves not only the game dynamics but also the role of the ICT. For example, we can ask ourselves, how can the ICT infrastructure of a smart city and the data that are available about it be used to improve the game experiences?

Social aspects. As crisis training and management is a collaborative issue it is important to ask ourselves questions such as: How can we encourage spontaneous or directed social play in urban environments among adults?

Space role. How does the role for the augmented city changes once transformed in a playground for training? Is there a possibility that serious pervasive games will redefine the structure of collective places?

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