Wanderer - Location Independent GPS-Game

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Abstract. Many pervasive game concepts using GPS-technology are developed for predefined locations; they are location based. In this study we present a game concept that uses GPS-technology in a location independent way, called Wanderer. The game uses the real world as a game space and inside this it transforms real objects to obstacles. Because it is not location based the player is free to choose his own game space and thus the difficulty of the game.

1 Introduction

New generations of mobile devices, such as mobile phones, PDA’s and portable game consoles are increasingly integrating GPS-technology as an extra feature and making them available for the normal market. These technical developments enable new possible forms of pervasive gaming. With such devices, games can be played everywhere and the real world itself can be easily integrated into the game play or become an integral part of the game environment. Through this development digital games have the possibilities to leave one’s private space and enter the public space. By using the real world as a game board, location-aware games [1] make physical objects and physical body movements important elements in digital games.

In this paper we present the GPS-game Wanderer to show how the real world can be used as a playground without being dependent on a specific predefined location. The concept is developed such that the game could easily be played with every mobile device equipped with GPS at any location.

2 The GPS-game Wanderer

The concept and partial prototype of Wanderer were developed and tested during the Cargo-Posse Mobile GPS Gaming Workshop 2005 [2]. The prototype setup consisted of an Apple iBook computer connected to a Garmin Etrex Legend GPS-device.
2.1 Project Background

During our first tests with the GPS device we recognized the following: while walking through the city with a GPS device we were more focused on the device’s display giving us the GPS data then on the physical world surrounding us. Furthermore, the accuracy of the tested device was only about 20 meters corrected to 5 meters (within the city).

To minimize the possible distraction from the real world through visual feedback from the GPS device we decided to develop a game based only on auditory feedback and using the public space as its game space. Because of the limited accuracy of the used device in the city and the intention to build a location independent game, we decided to use only speed and direction as input parameters in our game. This limitation enabled us to develop an intriguing game concept, focusing only on the elements, that seemed relevant to us.

2.2 Related Work

The game concept *Wanderer* was inspired by the game *Dance Dance Revolution* [3] and the urban street sport *Le Parkour* [4].

*Dance Dance Revolution* is a physical dance game. The game is typically played on a dance pad with four arrow panels: left, down, up, and right. These panels are pressed using the player's feet, in response to arrows that appear on the screen in front of the player. To win the game the player must follow the given commands. The player’s control over his body movement and his feeling of rhythm is essential to accomplish the commands. Experienced players often do not only follow the given commands, but combine this with creative dance moves.

![Dance Dance Revolution dance pad](image)

Fig. 1. Dance Dance Revolution dance pad

*Le Parkour* (also called Parkour, PK, l'art du déplacement, free-running) is a physical discipline founded by David Belle. Practitioners of *Parkour* (called traceurs)
try to get from one point in a city to another in a straight line. The goal of practicing Le Parkour is to be able to adapt one’s movements to any given scenario so that any obstacle can be overcome with the human body’s abilities (J. Lebret [4]).

Fig. 2. picture of traceurs jumping over a fence in order to follow his parkour

In the game Wanderer we combined the elements of both game activities. Like in the game Dance Dance Revolution the player gets commands for his movements. The commands must be followed by moving through the real space and overcoming possible obstacles like in Le Parkour.

2.3 The Game Concept

The GPS game Wanderer is played outdoor and can be played anywhere where a GPS signal is received. The objective of the game is to be in continuous motion. The player is not allowed to move slower or faster than a given speed range (about 3-4 km/h). The player receives auditory feedback on whether or not s/he is moving too fast/slow. Furthermore, the player must respond to auditory signals provided through a headphone connected to the game system. The auditory signals are commands such as “Go left!”, “Go right!” or “Turn around and go back!”. The commands are only triggered when the player’s speed is within the specified speed range. After an audio command, the player has a certain number of seconds to respond correctly to the command. In this reaction period the player could be confronted with physical objects that make it impossible for her/him to comply to the command (Fig. 3). The player is then challenged to search for a place in her/his surroundings where s/he can execute the command and gain a credit. If s/he fails to do so, a credit is lost. When the player has no more credits the game ends. Because the game is not mapped onto the physical space (it has no notion of where it is), it can be played in any location. Playing Wanderer, the player is continuously confronted with objects in public space, thus transforming physical objects in public space into objects that are part of the game space.
Fig. 3. The player gets the command “Go left!” Because a parked car blocks his way, he first has to run forward and then to the left. If he fails to do this within the given time limitation one credit is lost. This example shows how real objects become obstacles in the game space.

2.3 Initial Testing

For the first tests the developed prototype was suitable, but for further research a smaller hardware setup is preferable. Instead of using a GPS device with a laptop computer, a small GPS hand-held device would give more flexibility. Nevertheless, during the tests with the first prototype some results could be concluded. Primarily, the game is pervasive. During the tests the players where highly motivated to follow the commands given by the game even when the environment was not allowing the player to perform the instructed movements. For example, players crossed streets, even with cars approaching that were forced to stop in order not to hit the player. During this example the players made it clear that they were not unaware of the environment, but were willing to force the environment in order to keep playing the game.

3 Discussion

Location-aware games such as Wanderer, played outdoor in public space, confront the player’s in-game desires with elements of the real world. The game space, the so called magic circle as defined by Dutch historian Johan Huizinga [5] is now interfered
by real consequences. In location-aware games the game space is mixed with elements of the real world. The player has to consider not only the in-game consequences, but also the consequences of his/her actions in the real world.

The question arises, how far a player would go by playing a game in public space? Will players respect common norms and rules within public space in the same way as they respect them while not playing?

Playing in public touches also another interesting matter, namely the relationship between a player and the audience in public space. Does a player’s game play change when his/her actions are being observed? Does the awareness of being watched change the player’s performance? All these questions arise through the phenomena of mixing the game world with the real and serious world in pervasive gaming. These matters of mixing realities are further discussed by Jane McGonigal [6], in her work about immersive and pervasive gaming:

“A good immersive game will show you game patterns in non-game places; these patterns reveal opportunities for interaction and intervention. The more a player chooses to believe, the more (and more interesting) opportunities are revealed. In conclusion, I choose not to see pervasive players’ performed belief as a kind of paranoia or dangerous credulity, but rather as a conscious decision to prolong the pleasures of the play experience and to apply the skills acquired in gaming to real life. [6]”

4 Conclusion

With the game Wanderer, we demonstrated a possible way to use GPS technology to create a game without being dependent on a specific predefined location. By concentrating on limited technical elements (only using speed and direction of the GPS output), we came up with a simple but intriguing game concept that could easily be played on most mobile devices with GPS and in nearly any urban environment. By discussing the first small test results, already some interesting questions were raised about the effects of playing pervasive games in public space.

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