MobileChase – Paper Chase With Mobile Phones

Markus Etz, Daniel Holweg

German Abstract

Ortsbasierte Spiele verschmelzen die reale, den Spieler umgebende Welt, mit der virtuellen Welt des Spiels. Reale Orte wie eine Stadt werden zum Spielfeld und weitere Personen in der Stadt zu Mitspielern. Einfaches Beispiel bildet das beliebte GeoCaching, bei dem Spieler mit Hilfe von GPS-Geräten an einem unbekannten Ort versteckte Objekte auffinden. Basierend auf den typischen, wiederkehrenden Elementen ortsbasierter Spiele wurde ein Framework entwickelt, welches die Grundelemente ortsbasierter Spiele bereits abbildet und somit dem Spielentwickler ein Gerüst zur Verfügung stellt, welches durch Anpassung der Objekte an das jeweilige Spielszenario angeglichen werden kann. Wesentliche Spielelemente sind hier bereits vormodelliert, so dass der Spielentwickler sich auf seine eigentliche Kernaufgabe – nämlich der Ausgestaltung des Spiels – konzentrieren kann. Erstes Spiel auf Basis der Plattform bildet die moderne Umsetzung der altbekannten Schnitzeljagd: MobileChase.

Location-based Games

As the continuous development of mobile devices leads to an increase of technical functionalities offered to the user, a change from using mobile devices as pure communication instruments to instruments used for entertainment and recreational activities can be observed. One example for this change is the increasing number of so-called location-based games (LBG) in which virtual game elements, like game-rules and virtual objects, are merged with elements of the real world, like locations and real players who are situated at that location. In LBGs, single players or teams accomplish tasks in a predefined scenario, often using location-based services on mobile end devices. While from a technological point of view the popular geo-caching with the players' task to find hidden objects by using GPS-devices builds a simple example for an LBG, modern sophisticated mobile devices allow the development and playability of more complex LBG with more complex tasks.

LBG-Framework

When taking a closer look at the underlying concepts of LBGs, many recurring elements can be identified. For example, every game has its specific rules and a number of players with specific tasks. In addition, one of the central aspects of every LBG is the reference to positions in the real world. Thus, LBGs are in need of modeling the position of the players and the position of game-related objects. Based on these recurring elements, a platform for LBG was developed at the Fraunhofer Institute for Computer Graphics Research (IGD). By offering pre-modeled game elements, the platform allows game-developers to quickly and easily develop and implement the most dif-

Figure 1: Playing MobileChase.

ferent game concepts. The modular character of the framework allows a prompt exchange of different positioning, identification and visualization components for different end devices and models. In this way, the developer can fully concentrate on the embodiment of the game content. As the framework is based on generic technologies, the offered methods can be substantiated for varying device-types, thus addressing in-situ players using mobile devices or players at home in front of their regular desktop computer. Due to the modular structure of the platform, elements can be changed and thus adapted to the goals of the game, for example using maps for visualizing the current position of the player and goals to be reached for one game and using plain textual information (for example »In 500m you will find a special object«) for another game. As for managing complex game-scenarios, a central management for all players and all tasks is needed. The framework and its specific tasks are implemented – depending on their particular tasks – both on a central game-server and on the mobile clients. While the mobile clients are mainly used as interfaces between the game and the players, the game-server manages complex tasks like the coordination of various players and their tasks, or the calculation and provision of a suitable map. The end-to-end communication between the clients and the game-server is done by using web-services.

MobileChase

The first game based on the game LBG framework is MobileChase, an implementation of the well-known outdoor game paper chase. While in the classic game one team is marking its way by painting arrows or leaving pieces of paper on certain places, MobileChase brings this game principle to a new level by using mobile phones and location-based service technologies. In MobileChase, the players are divided into two groups, each of which is equipped with a mobile phone. The task of the first group is to precede and to mark their path by taking pictures with the mobile phones' cameras at every turning point thus indicating a shift in direction. Every picture taken is then automatically added with a geographical coordinate by using a GPS device and then sent to the managing game server. The task of the second group is to pursue the first group. For this, the second group is provided with a three-dimensional playing field on their mobile phone. At the beginning of the game, only one picture made by the first team is shown on this playing field giving the first hint. When the second team reaches this point, a comparison between the geographic coordinate of the picture and the position of the team is done on the game-server. If both positions match, for example if the second team is at the place where the picture was made, this subtask is fulfilled. The players are provided with a new picture which is added to the three-dimensional playing field in the correct position relative to the first one. As this adding of pictures is done at every correctly found waypoint, it becomes more and more easy for the second team to find the first one due to the deductions which can be made out of the positioning of the pictures in the playing field. When the second team reaches the first team, the Bluetooth technology is used to identify the team. For this, the second team starts a scan of the Bluetooth devices in its range (usually a few meters). If the first team is inside this area, this is detected by the game server and the second team has won the game.

Figure 2: Game field of MobileChase showing the locations to find.

Further scenarios

While MobileChase, with the goal of entertaining the players, has been the first location-based game which was realized on the basis of the LBG platform, various differing game concepts with different goals – like serious gaming or edutainment – can be thought of. As an example, an educational city rally, in which the gamers are guided through a town by instructions given in the game as well as provided with historical facts about the locations they are visiting, might offer new possibilities for communicating cultural and historical facts in an entertaining way for visitors of cities or cultural sites.

Note

MobileChase will be presented on the Fraunhofer-Forum (see page 33-34) and the »future talk« at the CeBIT 2007.

Points of Contact

Markus Etz, Daniel Holweg
Fraunhofer IGD, Darmstadt, Germany
E-mail:
markus.etz@igd.fraunhofer.de
daniel.holweg@igd.fraunhofer.de