Chapter 9

Mobile Virtual Heritage Exploration with Heritage Hunt with a Case Study of George Town, Penang, Malaysia

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ABSTRACT

Computer games with fully intensive graphics are very common in desktop computers or game console, but the development of mobile games with intensive graphics are fairly new. With the advancement in mobile phone technology, it is possible to create a mobile game incorporates integrate the virtual reality techniques. In this paper, the authors present a virtual heritage application called M-Heritage Hunt that integrates virtual reality and game for mobile platforms. M-Heritage Hunt provides panoramic views of the heritage sites and a game background that is customized for the core of heritage zone of George Town, Penang in Malaysia. M-Heritage Hunt was evaluated and examined by letting the respondents to play the game in its proposed setting.

INTRODUCTION

Virtual reality (VR) is a term that applies to computer-simulated environments that can simulate physical presence in places in the real world as well as in imaginary world. Most current virtual reality environments are primary visual experience and displayed on computer screen. Furthermore, virtual reality covers remote communication environments which provide virtual presence of users with the concepts of telepresence either through the use of standard input devices such as keyboard and
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The simulated environment can be similar to the real world in order to create a lifelike experience. VR has been employed in many areas such as heavy industries, training and education. The technology is becoming unavoidable in the new emerging digital visualization fabric but it is still relatively unexplored on mobile device platform. In virtual heritage, VR brings a sense of reality to the users and provides the users with a clearer and more immersive view of the surroundings of a heritage building or site.

George Town, Penang was granted the status of world heritage site by United Nations Educational, Scientific and Cultural Organizations (UNESCO) on the 7th of July 2008. George Town heritage site is divided into two zones which are the core zone and the buffer zone. The core zone is bounded by the Straits of Melaka contains of more than 1700 historic buildings. The buffer zone is an area of 150.04 hectares that protects the core zone.

In this paper, we present an application of VR in virtual exploration of heritage sites on mobile platform that incorporates a game called M-Heritage Hunt. The main objectives of this game are to create an environment that provides panoramic view of various heritage sites, to attract and promote a particular heritage area and to increase the learning experience of George Town, Penang, Malaysia. M-Heritage Hunt is a novel game which is a hybrid of the traditional games of monopoly and treasure hunt. The main platform is the monopoly game which provides the outer view of a heritage area while the treasure hunt acts as a mini game within the monopoly that provides the inner view of a heritage building. A heritage gallery is also provided so that the users are able to view both the inner view and the outer view of a heritage building using panoramic view (Xiong & Pulli, 2010). In our work, the UNESCO World Heritage Sites of George Town, Penang in Malaysia are chosen for the development of a demonstration system for a game.

Related Work

Squire (2007) proposed that games can be an attractive medium for learning that should have attracted significant attention of educators. Furthermore, activities such as visiting and exploring a place, and playing a game can be used to gain new knowledge on the history, background, design and cultural perspective of a building or site. Tan et al. (2007) mentioned that using a game is a good model for learning and is applicable to all learners. Teachers or developers can make use of the game as a medium to convey the learning contents. Azan and Wong (2008) stated that learning history is difficult for most students, but if game is applied in the teaching, it will become easier and more interesting to learn.

Carr (2010) has applied game in teaching physics and has successfully explained a complex physics theory (Einstein’s Special Theory of Relativity) that is difficult to understand by most students. Applying game in teaching is the best approach to be adopted in teaching especially in complicated and boring subjects.

Hou and Bai (2007) presented a study on a good interface design for game applications. Song et al. (2004) have developed a digital heritage application that serves as an edutainment tool that incorporates interactive storytelling techniques in order to enhance the process of exploring the virtual environment.

Toh et al. (2010) presented a case study on adopting a combination of user research processes to produce the mobile augmented reality guide on design requirements from the tourist perspectives. In order to collect comprehensive user data, text recognition feature, user-friendly information, panorama photos, virtual contents (i.e., 3D characters, animation), push and pull content, augmented social experience (sharing of photos and memories) and group touring experience should be combined together into the mobile platform.