

Virtual Environment for Participatory Simulation in Tourism

Dingding Chao¹, Taro Kanno¹, and Kazuo Furuta¹

¹Department of Systems Innovation, Graduate School of Engineering, The University of Tokyo, Japan

1 Introduction

Theories and techniques for information systems in tourism have been well developed in recent years. These information systems assist tour planning for tourists and improve tourism services. However, contrary to the increasing interests in advancing technological applications, thorough research from the perspective of tourists is lacking. Previous studies in tourism from the social perspective commonly utilize questionnaires to collect data for analyzing tourist behavior. However, as tourism studies become more and more inter-disciplined, and as touring activities become more complex, mere questionnaires may not be able to cover every aspect of tourist behavior. New approaches that combine the merits of research from engineering and social perspectives are needed. This paper intends to explore the potential of a virtual environment to serve as a platform for undertaking participatory simulation in tourism and understanding tourist behavior.

2 Participatory Simulation

Participatory simulation is not a recent invention, but has gained significant focus in recent years as a strategy to further improve the reliability of agent-based simulation. It enhances the sensibility and validity of the decision-making logic of “agents,” who are actually human participants. By combining experiments involving real people and simulated environments and scenarios, researchers are able to explore behavior patterns in the real world and examine the theories beyond the artificial settings.

2.1 Participatory Simulation for Tourism Studies

Few researches in tourism utilize participatory simulation as a methodology to stimulate interaction and enhance the physical and emotional involvement of the experiment/survey participants to have a better understanding of tourist behavior and decision-making process. The present study proposes a new approach for studying and discovering tourist behavior patterns through virtual environments and computer simulation to create artificial, but similar to the real world, tourism space for collecting and recording data, as well as exploring the entire tourist experience.

4 Open Simulator and Virtual Environment

4.1 OpenSimulator

OpenSimulator is an open source platform that can support Second Life-like 3D applications. Multiple users can create, customize, and access virtual environments in OpenSimulator. The OpenSimulator has the following features that ensure the platform’s capacity to develop virtual environments for participatory simulation.

- i. Capability to create multi-user 3D online environment
- ii. Support for real-time physics and interactive user experience

- iii. An open-source that allows researchers to develop and extend their own virtual world based on the needs of tourism studies

Although OpenSimulator shares many similar features with Second Life, it is not a clone of Second Life's server, nor does it ever intend to be. OpenSimulator is suitable for academic research purposes because it

- i. can run locally,
- ii. is cleaner for research use,
- iii. is easy to modify and extend,
- iv. saves on cost, and
- v. lacks support for many of the game-specific features

Existing studies have successfully applied OpenSimulator to development of simulation platforms for studies in education. However, most of these studies are outside the area of tourism. We believe that the OpenSimulator can become a powerful tool to break through the bottlenecks of existing tourism research.

4.2 Application in Tourism Studies

One of the limitations in current tourism studies is the lack of awareness regarding the dynamic and irrational process inherent in tourist decision-making. Statistical data gathered from questionnaires before, after, or even without the actual trip are often used to analyze tourist behavior. However, determining the preferences of tourists/participants is difficult if they are not involved in the touring experience. A participatory simulation with experiment conducted in a virtual environment can conquer this problem, as such simulation creates the entire tourist experience and records the process when participants take their tours in it.

The virtual experiment in OpenSimulator (some contents from other users/developers of OpenSimulator under creative commons license are used) is developed to test the effect of the sequence of visiting attractions on tourists’ satisfaction with their travelling experience. In relation to this, two different virtual worlds were developed to examine the effect of both the destination level and the attraction level.





Fig. 1. Examples of simulation scene

For the destination level, the virtual environment consists of four “regions” in the OpenSimulator:

- i. Mountain area
- ii. Sunshine beach
- iii. Another mountain area
- iv. Modern city

For the attraction level, the virtual environment consists of only one “region,” but with the following tourism attractions:

- i. Garden
- ii. Gallery
- iii. Seaside
- iv. Spa
- v. Mountain

By inviting common participants and “travel experts” to join the participatory simulation and rate their touring experience in each destination or attraction during their trip, we can test our theories on the sequence-of-visit effect and examine the validity of the methodology of applying a virtual environment to participatory simulation for tourism studies.

5 Conclusion

The paper explores the potential of a virtual environment and its application in participatory simulation for tourism studies. Platforms such as OpenSimulator should be further utilized in developing participatory simulation to deepen the understanding of the decision-making process of participants.

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