Using Evolving Histories to Enhance Place and Presence

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ABSTRACT

The poster describes the development of natural language location aware agents (known as Presence BOBs) which are designed to act as personalities of mixed reality places. The objective is to enhance the sense of place and presence of the end users through the agents talking about the history of the place. The agents work using speech and text based interaction.

Keywords

Presence, natural language, mixed reality, place, location awareness, agents, augmented reality, social awareness, virtual reality

INTRODUCTION

Mixed reality worlds combine the real environment with computer generated buildings, people and objects, they represent an advancing area of research. However despite the technical advances some important issues regarding the user's sense of place and presence remain. This poster describes a twin pronged approach which specifically explores how to enhance sense of place through the use of histories and also the use of agents to increase the user's sense of presence.

In order to address the two areas mentioned the poster introduces the concept of Presence BOBs (Basic Omnipresent Beings). BOBs are designed to overcome the problems related to lack of history in the mixed reality world by sharing their experiences and those of other users with the objective of enhancing sense of presence and place. They make use of location aware technologies, mixed reality systems and natural language processing in order to provide the user with a rich experience. As they are developed they will also exhibit behavior either in the form of conversations or movements which are based on their knowledge of the place which may in future include drawing on Alexander's architectural patterns [1].

Place Presence and Histories

Sense of place can based on first hand experiences (e.g. visiting a location), or through second hand experiences such as reading books or seeing pictures. It consists of a combination of physical properties, associated meanings and the activities undertaken by the visitor and other people. In contrast presence is when an individual feels like they are actually some where, this feeling is mainly a first hand experience and can take place in real and virtual environments – although there is some debate on whether people can also feel present in narratives such as those contained in books. For a discussion on place and presence see [2].

An entirely real world location consists of many aspects including its regular visitors, activities and histories. However in mixed reality settings the users may only be in the experience for a short period of time, moreover the sense of history within the location may be related more to the real aspects than a combination of the real and virtual. One typical example would be if the user stopped to talk to a real person, it is unlikely (until mixed reality is more widely used) that this passerby in the street would have much if any knowledge of the history of mixed reality experience. They may be able to talk about what sort of real people who visit the area, but it is unlikely to know much about the history of the overall mixed reality experience. Presence BOBs bridge this divide by creating and sharing histories of the overall experience.

Background

Presence BOBs draw on earlier work into navigational aids such as electronic tour guides, web page systems such as Agnetha and Frida [3], so-called natural language chat bots and mixed reality agents [4]. They also draw on some of the ideas related to social navigation within information spaces, although they are not specifically designed to aid in navigation. In common with tour guides they present location based information such as stories, however what they discuss is not predefined. For example while the stories may be tied to specific locations, the shorter discussions are based on what the user is currently talking about and information gained from previous users. They are designed to operate within a mixed reality game known as TimeWarp and share information which is relevant to the current game play context, such as what other players have been talking about or doing at that location. Furthermore they share some aspects with the web based system Agnetha and Frida, in the sense that they also provide superfluous details, such as their own likes and dislikes. However they attempt to subtly guide conversation in a way which encourages the end user to talk and think

about their feelings towards the place they are currently visiting.

Design and Content

As sense of place is a key aspect it was decided that the first BOBs will represent the personalities of specific locations e.g. Cologne Cathedral (See figure 1); which in theory should make users link each location and its BOB more easily. The BOB system draws on Heeter's [5] definition of presence, by supporting environmental presence, this is where the environment appears to respond to the end user (in this case the BOB is deemed to be part of the environment). Social presence: this is where the user's sense of presence increases due to their awareness of others, or in this case the BOB agent. Personal presence is where users feel "in" the environment. Related to this is the question of how to best represent the "place" in the form of a BOB, for example which graphics, voice and narratives to use. These attributes will in turn have an effect on the users first hand experience of the place, for example if the voice or sentences sound unnatural this may result in a drop in the users sense of presence.

Figure 1. The square outside Cologne Cathedral (left).

The system communicates with the user using a combination of preset phrases, those generated based on past comments by other users and dynamically generated sentences. The user can communicate with the BOB using text or speech, an example is below (Simon is the user).

Bob: Other than the cathedral is there anything else you see here?

Simon> some people

Bob: I wander what they are doing?

Simon> they are running around and chatting

Bob: Tell me more about the people?

Simon> some are very ugly like the gargoyles on the cathedral

Bob: Peter was telling me about the gargoyles earlier. Do you know much about them?

Simon> no, but they are very ugly

Bob: Why do you find them ugly?

Simon> they are all twisted

Technical Architecture

The BOB system is built with Stackless Python and uses MontyLingua [6] to process and in some cases generate the natural language. It also uses the Microsoft Speech SDK and SQLite. It is intended to exist as a module which can be used with the MORGAN (AR/VR framework) [7]. The Morgan system provides access to the hardware aspects such as rendering (including shadows), tracking of objects and users, and input/output devices.

Studies

A study is due to be undertaken shortly which will explore the effect that the BOB system has on presence and sense of place. The study aims to highlight areas for improvement as well as identify which content related aspects have the largest impact on presence and place.

Conclusions and Future Work

Presence BOBs represent an interesting way for people to find out information about the history of mixed reality places. At the time of writing the system works to a basic level but requires some improvements in areas such as dialogue flow, grammar and content. In addition to the studies already mentioned there is also a need to explore which models of place to use in order to store and retrieve the information.

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