An Embodied Conversational Agent Supporting Scene Exploration by Switching between Guiding and Accompanying

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ABSTRACT

In this late-breaking report we first motivate the requirement of an embodied conversational agent (ECA) who combines characteristics of a virtual tour guide and a knowledgeable companion in order to allow users an interactive and adaptable, however, structured exploration of an unknown immersive, architectural environment. Second, we roughly outline our proposed ECA's behavioral design followed by a teaser on the planned user study.

1 MOTIVATION

After entering an unknown immersive, virtual environment and familiarizing with the respective virtual reality equipment, the first task often carried out by users is the *scene exploration* [3]. As this step of acquiring scene knowledge is often crucial for subsequent tasks, users are typically supported in this endeavor. One common approach is embedding a computer-controlled anthropomorphic and conversational character, a so-called embodied conversational agent (ECA), fulfilling the role of a virtual tour guide. As explored by Bönsch et al., this ECA guides the user through the scene and thus allows for a structured experience while avoiding that the user gets lost in complex scenes or misses critical information. Although the user can now fully concentrate on gaining knowledge, he or she becomes a passive receiver reducing the sense of personal agency as well as user investment. Active exploration with exploratory freedom, in contrast, accompanied by a knowledgeable ECA as alternative has not been proven too effective either, as a structured experience was missing [1]. To this end, a compromise between both roles is required, allowing users an interactive and adaptable, however, structured scene exploration.

2 ACCOMPANYING TOUR GUIDE

In our approach we strive to combine two modes: (i) a tour mode, guiding users on a predefined path while ensuring that all information are shared and (ii) an accompanying mode, allowing users to freely explore the scene while being provided with information when being attracted by something seen and being informed when crucial locations are missed. To this end, we consider the structure of areas and points of interest (AoIs/PoIs) for pure outdoor scenes. While PoIs are self-containing units, an AoI typically comprises various PoIs, e.g., a park with statues and fountains. Thus, the ECA will guide users along independent PoIs while allowing free explorations of AoIs, schematically shown in Fig. 1. For the AoI, the ECA guides the user to a suitable entrance point, gives a general introduction, and switches to the accompanying mode while the users decide about the route to be taken. In case users miss or do not show interest in a certain PoI, the ECA will inform them and offer explanations which

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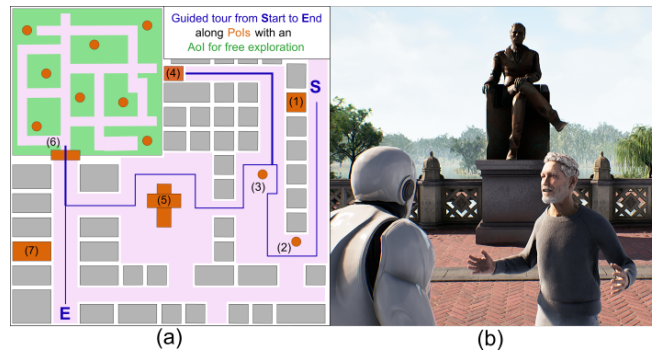*e-mail: boensch@vr.rwth-aachen.de

Figure 1: (a) An abstract city map with PoIs and an AoI. (b) The user, depicted as Unreal Mannequin, is informed by the accompanying tour guide about a statue (PoI) in the park (AoI).

can be accepted or declined. In case users want to proceed the tour, the ECA switches back to the guide mode.

In both modes, the level of detail of the given explanations will be adapted to the users' attention level. By analyzing the users' behavior such as looking or wandering around, short and more general explanations will be given to bored users and more detailed ones to interested users. Furthermore, users themselves can cut explanations short or ask for more details using natural language.

3 USER STUDY

We plan to conduct a user study in a large-scale, unknown city with various AoIs and PoIs spread all over the urban place. In a between-subjects design, participants will be asked to explore the city knowing that they have to answer different structural and detail questions about the city afterwards [2]. During the exploration, they will be either supported by our ECA (focus group) or they will be on their own (ground truth group). Our aim is to evaluate the ECA's impact on the users' comfort, the perceived (social) presence as well as the spatial awareness. We want to gain insight on whether the resulting tour is rated as interactive and adaptable, however, structured enough and whether users accept the varying roles of the ECA and rate their transitions as suitable and transparent. During the workshop, we seek for feedback on our user study design which we will concretize during our presentation.

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