

Checkpoint Exercise: Training with Virtual Actors in Virtual Worlds

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Abstract. We have implemented a checkpoint exercise in Second Life where the user interacts with several computer avatars in a team based activity. We describe the experience and the implementation of our solution and show some evaluation results.

1 Introduction

In this work we examine the application of autonomous avatars that can play roles that involve interaction with the trainees in a complex situation such as a checkpoint operation. In addition to controlling civilians in the simulation we explore the use of virtual human technology to control virtual teammates. In this way the trainee can go through the training even when the whole team required to perform the exercise is not available.

We have developed the training exercise in Second Life. Our main reasons for choosing this platform were the availability of libraries that allow programmatic control of avatars and the fact that Second Life has a large user base. There has been previous work on conversational agents in Second Life, but those usually just involved a single avatar. We expand on the architecture of Staff Duty Officer Molenó [1] to facilitate the requirements of the checkpoint exercise. The main differences are that we control a larger number of avatars that have to coordinate with each other and exhibit a wide range of behaviors. As such we have developed a more robust behavior control system that provides flexibility and modularity in control. In addition the controlled civilians can play various roles in the exercise similar to live role-players. For this purpose we're using a director component that assigns roles and coordinates the different autonomous avatars in a way similar to that used in interactive drama. The conversation management keeps track of the active conversations and handles the processing of user input. The understanding of user input works at the surface text with NPCEditor [2] as the classifier, which uses cross-language information retrieval techniques to learn the best output for any input from a training set of linked questions and answers.

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2 Checkpoint Exercise

The checkpoint exercise involves a team of two soldier avatars, stationed at a checkpoint outside of a Middle Eastern desert village. In the current setup one of the avatars is controlled by the human trainee, the other – by a virtual human (Grunt Rumble). Potentially the second avatar can also be controlled by a human player. Multiple indigenous villagers (avatar agents) approach the checkpoint to enter the village. The task of the team is to make sure that no illegal or dangerous goods make it into the village. The teammates take turns inspecting the village visitors, examining their possessions and identifications. They can question the visitors about their business in the village. If a visitor’s story raises suspicions, the team may decide to seek confirmation by sending one of the members into the village to investigate. The team can either allow the visitor into the village or detain him based on the outcome of the interview and investigation.

We had several goals in the design process. We wanted an activity where the users could learn procedural skills and required some distribution of tasks to make the role of the teammate meaningful. We also wanted an activity that involved many avatars. Finally, we wanted the experience to be fun for the users.

The entire creation of the activity from conceptualization to implementation was done in about two months. We initially planned for nine different story vignettes, each with two possible outcomes (chosen at random) that could be revealed after investigation, but we only implemented two of them due to time constraints. The two stories involved a total of twelve unique avatars.

3 Evaluation and Future Work

For evaluation purposes we had 15 participants go through the exercise. Most expressed that they liked the free-form nature of the experience where they were able to decide who performs what task and to move around the world and ask any questions they wanted. Some also expressed that they liked it because it gave them an idea of what a checkpoint inspection feels like. A few participants commented that understanding problems were more acceptable from villagers than from the teammate. We also entered our application in the Federal Virtual Worlds Challenge where we won second place in the “Patterns of Life” category.

Our current focus is the development of dynamic content and language capabilities within the checkpoint scenario. In particular, we are working to equip our characters with an ability to communicate what they know about their dynamic virtual environment.

References

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