

Balancing Plot and Character Believability by Reasoning Out-of-Character*

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Abstract

We are designing a serious game in which players need to become aware of their social behaviour by interacting with virtual characters. These characters need to behave believably while guaranteeing that the player reaches that learning goal at a certain point during the game’s story. I propose to let them use out-of-character reasoning to step outside of their role in the story. Then, they can decide which actions to take that lead to the learning moment while maintaining their believability.

1 Introduction

Interaction for Universal Access is a project in the Dutch national program COMMIT¹ which aims at developing technologies that can detect social signals from non-verbal behaviour and that can engage people in social interactions. My research within this project focuses on using interactive storytelling to improve the social awareness of police officers. We will develop a serious game in which virtual characters are able to engage in social interaction with the player. Thus, the player—a police officer—should learn how his or her social behaviour influences other people’s reactions by perceiving how his or her actions determine the progress of the game’s story.

Today, most games are scripted or have simple branching points in their narratives. The field of interactive storytelling investigates more advanced forms of interacting with narratives. Its research can be divided in *strong story* and *strong autonomy* approaches, which focus on having a good plot and believable characters respectively. However, we need both for an optimal experience. I will take a strong autonomy approach as a basis for my research because of the emphasis on believable characters, which are necessary in social interaction, and aim to enrich it with *out-of-character* (OOC)

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¹See <http://www.commit-nl.nl/projects/interaction-for-universal-access>.

reasoning. This means that the characters are able to think outside of their *in-character* (IC) role and take decisions as to which actions they should take so that a narrative emerges. This is alike to the thought process of improvisational theatre actors who step OOC to consider which action to take to let a scene develop. In our context, the characters should act to let the player attain the learning goal of the game. Thus, the player has freedom in the game, yet the characters steer the narrative in the game towards learning moments so that the player becomes aware of his social behaviour. I expect this adaptivity to increase players’ feelings of agency and replayability of scenarios.

I will implement this approach in the Virtual Storyteller (VST) [7], an agent framework for story generation developed at the University of Twente. I mean to enrich current agent technologies in the field of Information and Knowledge Systems to balance plot and character believability in a serious game.

2 Related Work

Façade [6] is a well-known example of a system using a strong story approach to interactive storytelling. It relies on scene specifications that limit the set of actions characters can perform. These characters are controlled by a central entity that decides their course of action. This sometimes leads to incoherent behaviour when a scene transition is made or when user input does not have its intended effect.

Taking the strong autonomy approach, FearNot! [5] is a system that strives to effect an *emergent narrative*, i.e., a narrative that emerges from the combined actions of characters. To have some control over the plot, the FearNot! architecture allows the characters to use a limited form of OOC reasoning, viz. by selecting the action with the highest potential for emotional impact. This was designed to keep the story interesting, but it was never developed beyond a first simple implementation.

Work done on the VST [7] built on this idea by implementing the technique of *late commitment*. This lets characters assert OOC certain facts that the narrative may benefit from. For instance, an agent can assert OOC that its character has a key in his possession to open a locked door so that the narrative does not become dull or end at this point.

3 Agents Guide the Game Out-of-Character

I wish to extend the framework of the VST by developing OOC reasoning so that it supports guidance of the plot by characters to enable attainment of learning goals. That is, characters have an IC and an OOC part, of which the former is responsible for believable in-story behaviour and the latter for guiding the plot. Plot guidance is done by letting characters choose certain actions that lead to a state in which a learning goal can be attained. It is important that the chosen actions are consistent with the story so far.

As the learning goal in our serious game is improving social awareness of police officers, the game should make clear how their social behaviour influences other people. Because people can have different personalities, their reactions to the same behaviour may vary. This idea can be used to let characters adapt their personality OOC in reaction to the player's initial behaviour. The scenarios we will develop always include a prominent conflict between the player and another character (or a group of them) in the domain of law enforcement. Combining these two notions, I wish to let the inherent conflict escalate by letting the characters assume a personality that opposes that of the player [3], which should happen in response to the player's initial approach. For example, consider a scenario that involves loitering juveniles. A police officer has various options to confront them, e.g., by rapidly approaching them, demanding respect with a loud voice or by taking a more calm, submissive stance towards the youngsters. To let the conflict escalate, the agents controlling these juveniles can adopt IC personalities that react aggressively to these kind of approaches. The new character personalities will let the conflict develop, after which it can be resolved either positively or negatively.

The conflict can be monitored OOC to see whether it reaches a proper climax and resolution, so that the characters may intervene when this is not the case. I feel that this is necessary for overall story coherency and wish to evaluate this through user testing. To implement this knowledge in the characters, I will investigate research done on conflict cycles and dramatic story arcs [2, 4]. Besides studying story arcs, I aim to gather domain expertise on typical conflict scenario behaviour in law enforcement both by police officers and crime suspects. In our project, we currently focus on a scenario that includes loitering juveniles and therefore we contacted domain experts on street intervention.

Because of the distributed nature of the agents and their means to make decisions concerning the plot, the agents need to agree on plot-influencing choices they make. One approach to overcoming this issue is found in improv theatre, in which actors can make offers, i.e., decisions about some aspect of the scene, that progress the story that may be accepted by other actors or not.

I wish to investigate whether such an approach could be feasibly implemented or that alternative, more implicit, approaches will suffice.

Currently, I am cooperating with two other PhD students whose research goes into more detail on social behaviour and game design, respectively. We shall develop annual prototypes of our game which will be subject to user testing to determine how well the learning goal is attained and how believable the characters and story are. As of now, we have begun making adjustments to the interactive version of the VST [1] to make it more modular. Parts of my research will be integrated in a multi-modal 3D environment in which law enforcement scenarios can be enacted, which is a joint goal of five PhD students in our project. The modules will be responsible for social signal processing (both recognition and interpretation), turn taking, storytelling and gaming elements.

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