SimDate3D – Level Two

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Abstract. In this demo, we present a working example of a simple game based on character-centric interactive storytelling. The game is situated in a small virtual town where three characters, two girls and a boy (or two boys and a girl) are involved in a dating scenario. The player may influence the boy and guide his actions, his goal is to steer the story to a desired shape with as few interventions as possible. The individual agents feature an affect-modulated BDI-based architecture and communicate with each other through simple language. The scenario culminates in a simulated confrontation of all three characters. Based on the current state of relationships between the characters, it results in one of multiple possible endings. The game is intended as both a testbed for interactive storytelling technologies as well as a source of data for evaluation of automatic analysis of generated stories.

1 Introduction

Creating believable human-like characters is an ongoing endeavor on the intersection of artificial intelligence, computer graphics, game design and psychological modeling. Such characters can then be involved in various settings, including but not limited to entertainment computing, psychological simulations and educational games. Among the possible applications of believable characters, character-centric interactive storytelling (IS) is one of the most difficult, since the characters are not only supposed to behave plausibly during interaction with the user, but also to interact with each other to create an interesting story. Lessons learned from the development of characters for storytelling systems present a great source of information that can be further used to improve believable character design in many other applications.

In this paper, we present SimDate3D Level Two (SD) (Fig. 1) – a simple game based on character-centric IS. SD is an evolution of our previous work [1]. The setting of the game is as follows:

Thomas, Barbara and Nataly live in a small town. Thomas has a girlfriend - Barbara - and... well... yet another girlfriend - Nataly. The girls don't know about each other. One day Thomas is on a date with Barbara when suddenly Nataly appears and things start to happen.

H. Koenitz et al. (Eds.): ICIDS 2013, LNCS 8230, pp. 128–131, 2013.
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Fig. 1. Screenshot from the SimDate3D showing character interactions

The game also features a symmetrical variant where there is one girl and two boys. For the sake of clarity we strictly refer to the first situation as described above.

The user is not directly present in the game, but observes the scenario as a floating invisible entity. The user is able to instruct Thomas to execute specific actions in order to achieve the highest score possible. The score is gained whenever Thomas performs certain activities with a girl (e.g. watch movie at cinema). When the user does not interact with the game, the characters will continue to act on their own according to their current goal behaviors and emotional state. This natural behavior however results in boredom and indifference between the characters, which is not desired by the user as it does not generate any score. Each intervention of the user to this natural story flow imposes a small score penalty. So to achieve the greatest score, the user tries to make maximum influence on the story flow with as few actions as possible.

The motivation of building this system is twofold. Firstly, we use it as a testbed for IS and believable characters technologies, secondly, we use this system as a source of data for evaluation of automatic analysis of generated stories. The analysis we perform is based on automatic extraction of tension curve and clustering of stories. The process is detailed in [2].

2 Related Work

Here we review only the most relevant related work – IS systems that are both games and freely available. Façade [3] is an interactive drama featuring two virtual characters – a couple with relationship issues. The user plays a role of an old friend, who was invited to the dinner at their place. The scenario is non-linear and the outcome

depends on user actions. The main differences between Façade and SD are a) in SD the characters communicate through emoticons (Fig.1) while in Façade they use speech and text input, b) SD is set up in a full 3D environment, c) in Façade the overall approach is more story-centric as a central drama manager controls the flow of the story (in SD it is more character-centric) and d) in SD the user does not have full control over a character. The reduced character control in SD creates a new type of gameplay and is more suitable for studying believable character behavior, as the protagonists need to be able to act completely without user intervention.

The Prom Week [4] is a social simulation game featuring high school students. The gameplay takes place in the last week before students Prom. The goal of the user is to solve social puzzles, e.g. "How to get Zoe to date the Zack, who is not popular in the class", etc. The SD features somewhat similar scenario in a smaller scale (with only one "level" to solve) with characters communicating through emoticons and set up in a 3D world. Our experience shows that shifting from a constrained, almost static environment as in Prom Week to a full-fledged 3D environment poses significant challenges for character design (e.g. animation synchronization, navigation, etc.). It is important to overcome these challenges for wider applicability of believable characters in practice.

3 Technical Description

The individual agents feature affect-modulated BDI-based architecture (detailed in [1]) and communicate with each other through a simple language represented by emoticons (Fig. 1). To connect to the virtual world, Pogamut [5] middleware is used. To simulate affect we have used OCC based [6] emotion model ALMA [7]. The resulting emotions are reduced to one dimensional value we call "feeling" that ranges from -1 to 1 and represents the relationship between characters. Feeling is used when selecting the next action by the currently active agent behavior. Behaviors are implemented as finite state machines. A single behavior per agent is always active and it is the one with the highest priority. An example of the behavior may be "an agent is going with another agent to the cinema and they are talking". Behaviors available to the agent and their priorities change according to current situation.

The user plays the game by "instructing" Thomas. She can trigger Thomas to say something (e.g. tell a joke), propose activities to the girls (e.g. go to cinema) or go to places (park, home, restaurant and cinema). The game ending comprises all the characters meeting together entering an argument. The outcome of this argument is based on previous user activity in the game (e.g. if Barbara likes Thomas more than Nataly likes him, there is a good chance Barbara stays with Thomas after the argument). The argument is fully simulated using beat-based scene coordination techniques [8].

User-evaluations of our previous work [8] have shown that the believability of characters is hugely dependent on various non-AI aspects. For example a girl that is badly dressed is often deemed not believable by the user regardless of actual behavior. The quality of animation, smoothness of movement and other aspects also play an important role. Thus a large body of work has been done to improve those "non-AI" aspects of believability. The complete list of lessons learned during this process is out

of scope of this paper, but one of the most prominent is that believable AI can never be done without reliable and polished character navigation.

Preliminary evaluation [2] shows that there are many ways the game may unfold and that a multitude of simple and understandable dating-related narratives emerges out of the character actions. The game challenge is based mostly on user's desire to achieve all possible endings, which is not at all simple. At the same time two play sessions are very rarely identical, so replaying the scenario should be rewarding.

4 Conclusion

We present a working example of a simple character-centric IS system. The system integrates several components that we consider well suited for this line of work: BDI agent architecture, OCC emotion model and beat-based scene coordination. We show that even such relatively simple architecture allows for replayability of the game and the emergence of a narrative. We were also forced to address many unforeseen challenges inherent in actually implementing a scenario in a 3D environment including working with animations and character navigation. We plan to use this system to evaluate our metric for automatic evaluation of emergent narrative (details in [2]).

Acknowledgments. This work was partially supported by the student research grant GA UK 559813/2013/A-INF/MFF, by the SVV project number 267 314 and by the grant P103/10/1287 from GAČR.

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