Scenejo – An Interactive Storytelling Platform

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Abstract. *Scenejo* is an Interactive Storytelling platform, supporting both structured story lines and emergent behavior. Authoring is performed either at the level of a story graph or dialogue patterns. The *Scenejo* platform supports several artificial actors conversing with a number of real actors, representing the users in the system. Artificial actors are visualized as animated 3d characters, and actor responses are presented by speech synthesis in combination with non-verbal behavior.

1 Introduction

The concept of *Interactive Digital Storytelling* has the potential to become a paradigm for future interactive knowledge media. It couples dramatic narrative with interactions of users, providing highest forms of engagement and immersion. It also stands for the connection of games and stories by utilizing inherent structural elements of both. Artificial characters taking the role of actors within a plot play an important role in the concept of Interactive Storytelling.

Digital storytelling agents can achieve more than simply being single virtual guides and virtual tutors, which are commonplace today in a variety of software products. As in stories, their role could be to interact with each other as a set of characters to present a dramatic storyline; and as in games, they have the potential to serve as all sorts of sparring partners for players to interact with, such as representing the bad guys, or companions who ask for help.

Scenejo presents our approach to create a platform for interactive applications in this field. *Scenejo* enables playful simulations of dialogues between several conversational agents and multiple users. It employs animated virtual characters and current chatbot technology as the basis for text-based interactions. The result is an emerging dialogue, influenced by the users' inputs and the bots' databases of possible dialogue lines matching a text pattern coming from either a user or another bot. Bots also take into account parametric settings and scene descriptions provided by authors.

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2 Related Work

Successful implementations of intelligent conversations with animated virtual characters are rare, and there is no real success on the entertainment market to date. One of the few examples examining a middle course between the two approaches of linear stories and emergent behavior is M. Mateas' and A. Stern's Façade [1]. It is based on a specialized dialogue management system and allows users to participate in a predefined and pre-recorded conversation between virtual characters. However, the system's design is focused on a specific scenario and authoring is currently supported for programmers only. The EU-funded project art-E-fact [2] presents a similar integration of simulation and plot. In contrast to Façade, an authoring system is central to the way a story is built in art-E-fact. Storywriters defining digital conversations start with a story graph of explicit dialogue acts, similar to branching, and provide more complex interactions by adding rules and chatbot patterns within nodes of the graph.

With *Scenejo*, we follow a similar goal as in art-E-fact, but start at the opposite end. From the start, we use chatbot text patterns to provide free conversational interaction with users, and in a bottom-up way, we introduce a story graph allowing writers to line up conversational scenes and their parameters.

3 The Scenejo Use Concept

Scenejo is a storytelling platform that renders conversations between multiple artificial characters in combination with free textual user input in a multi user environment. It provides the possibility to let virtual characters enter into a discussion or even a dispute, involving users by asking them for advice, for opinions or by prompting them for directing their interest. The ideal content areas to cover with such dialogues are domains containing either uncertain facts or knowledge elements that are subject to interpretations, such as in the arts or in philosophy – as in its ancient archetype of Plato's Symposium. Another e-learning application field is the training of interactions based on language, or on dialogical skills. This can be suitable in training scenarios for difficult situations or negotiations, as well as simply for mastering the adequate terminology within a knowledge domain.

Scenejo is set up as an authoring system to create and experience emerging conversations. Users create a scenario by defining actors and their properties, such as gender, the voice to be used for speech synthesis, visual representation and a particular dialogue base for each actor.

Scenejo provides a story graph editor to describe the possible converse of a story. Scenes represent the building blocks for the story graph, defining the context and environment for a part of the interactive story. The most important elements of a scene are the actors that participate in this scene. Actors differ in representation, knowledge and vocabulary, and different actors may be assigned to single scenes. Scenes also describe the conditions for an automatic transition to another scene.

When the conversation is started, the bots assigned with the first scene begin to converse, matching text patterns reciprocally. Depending on the pre-authored patterns in the dialogue database, this can result in a rather phased dialogue, a chaotic argument or simply small talk. User input is handled the same way as the bots' patterns.

The dialogue is currently represented being rendered through the animated talking heads (see Figure 1), speaking ad-hoc with a digitally synthesized voice, without any need of pre-recording. Additionally, a text representation of the stage provides an overview about the dialogue from the beginning of a scene up to the current point.

The experience of interacting with the platform of multiple chatbots shows that there is high entertainment value through the fact that the course of the conversation cannot be completely anticipated, even not by the writer of the dialogue patterns. While there are still problems with non-sequitur verbal reactions to user input, people mostly cope with it as within chats in their real life, and as a result, rather assume strange character traits to the bots according to their appearance.

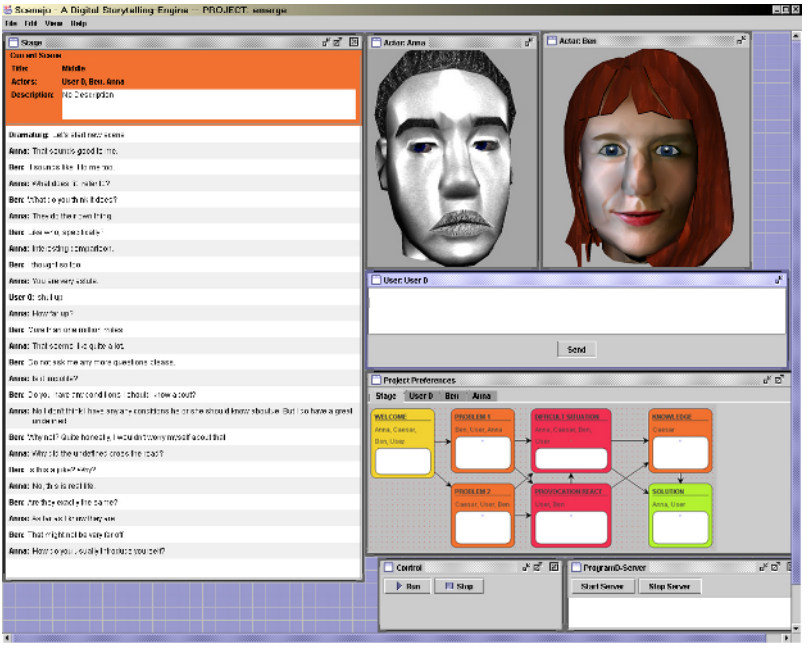

Fig. 1. The *Scenejo* user interface

4 The *Scenejo* Platform

The main components of *Scenejo* are the individual actors and a stage. The stage serves as the central unit coordinating the communication between the actors, managing and interpreting the story graph, and determining the current state of the story. It takes the main responsibility for the course of the story and decides when a transition from one scene in the story to another scene should occur. Scene transitions may be triggered for instance by reaching a specific goal, by the activation of a specific communicative act of an actor, or by the expiration of a timer.

Actors are the acting units in a story and represent the participants in the dialogues. There are two classes of actors: users and artificial characters. It is irrelevant for the

stage component which kind of actor it is dealing with. User actors represent the interface between a user and the system, recording the interactions and communicative acts of the user. User interaction is currently limited to chat-like text input via keyboard. In the future this will be extended to speech and video input.

Artificial actors have their own behavior; their reactions to interactions are determined on an individual basis. A decision component is responsible for finding adequate responses to the utterance of another actor. In *Scenejo*, the AliceBot chatbot system [3] is being utilized in this context, where textual input patterns and appropriate responses are described in terms of extended AIML rule sets. System responses have been further extended to RRL expressions to carry additional information on emotions, facial expressions, gestures, and body movements of actors to be shown in the context of an utterance. This information is used in *Scenejo* to provide adequate animated presentations of embodied virtual characters.

Important decisions about responses to utterances are made at actor level. The responsibility for presenting a detailed story graph down to the level of sentences and concrete words is distributed between the stage and the actors. Therefore, the *Scenejo* story graph is usually shallow and broad as in games structures, thus simplifying authoring. The storyline is complemented by another component, the dramatic adviser, which is responsible for managing turn-taking behavior and for granting priority to those communicative acts that are most important for the course of a coherent story. More details on the implementation of *Scenejo* may be found in [4].

5 Conclusions

Scenejo presents an interactive storytelling platform, rendering conversations between multiple artificial characters in combination with free textual user input in a multi-user environment. Actors are visualized as animated 3d avatars with speech output and augmented non-verbal behavior. *Scenejo* presents an approach to the integration of character-based and plot-based approaches.

References

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