The Simula Family

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ABSTRACT
In this paper, we will describe a pedagogical immersive 3D story TBI-SIM and how it works. The system is a narrative simulation in a fully immersive 3D world in which the user controls a character that can interact with non-player characters (NPCs) and objects. The users achieve goals and make frequent choices that have an impact on the course of the story, thanks to a AI-based interactive drama engine. The Simula Family is a game that helps teenagers living with a parent suffering from a Traumatic Brain Injury.

Keywords
Interactive Drama, Interactive Narrative, Pedagogical Interactive Drama, Pedagogical Narrative Simulations, Educational Games, IDtension, Traumatic Brain Injury.

1. THE CONTEXT

1.1 Focusing on TBI
Traumatic brain injuries (TBI) are a leading cause of disability and have a devastating impact on all members of the family: adults who must look after the injured person, as well as children or adolescents whose parent or sibling has been injured [2]. People suffering from a TBI can be aggressive or depressive, forget things or change mood rapidly, and are often physically handicapped. Nowadays, several initiatives exist to help people suffering from a TBI, but only a few focus on their teenager children. These children face difficult situations by living with a parent suffering from a TBI. They regularly face new responsibilities, which can lead them to feel overwhelmed with guilt, anger or helplessness. The usual solution consists in organizing meeting groups and face-to-face coaching sessions with a trained professional. However, it is difficult for a child to attend these sessions as they often have a lack of time and feel isolated and helpless.

1.2 An interdisciplinary project
Two research groups are collaborating on this project; an educational technology group specializing in interactive drama and a clinical psychology group focusing on family [1]. The interactive drama group is composed of a specialist in Interactive Storytelling, a writer and an engineer specializing in programming and graphic design. This project aims at helping teenagers living with a parent suffering from a TBI. It offers them online assistance in the form of a pedagogical interactive drama that create a home-like environment in which they have to deal with fictional characters who interact with a parent affected by TBI.

1.3 The scenario
The scenario takes place in a house where the Simula family lives. The user plays the role of Frank, a 16-year-old boy, living with his younger sister Lili, his grandmother Olivia and his parents. Paul, Frank's father, had a car accident a few years ago and is now suffering from frequent mood changes, memory problems, and socially inadequate reactions. Martina, Frank's mother, is still at work. When the scenario begins, it is early evening. Martina has asked Frank to prepare dinner for the family but Paul, due to his TBI, has forgotten all the ingredients he needed to buy. Frank needs to find a solution. This is the main goal of the game, but during the scenario several events may pop up to disturb the user; for example a phone call from Martina or the need to repair the DVD player. These events will lead to new goals that the user will also have to achieve in order to finish the scenario.

While the game has been designed for a specific population with a clear psychological coaching, its scenario is appealing to a much larger audience. Firstly, the specific situation encountered by the teenager in the game can heighten awareness to a similar situation that appears in real life. Secondly, having to manage a difficult person in a family is a situation many of us can identify with. As a result, the game is a unique family drama that pushes the boundaries of video games and interactive storytelling towards contemporary and realistic (not fantasy) contexts; what Marie-Laure Ryan calls the "temperate zone" [3].

2. THE GAME

2.1 Technologies

We are using the Unity3D engine to render the game (Figure 1). All scripts that manage the environment or the interface are written in C#. Unity3D is a powerful engine that allows us to compile the project on several platforms. The main version of our game is a web version hosted on a server that allows online access without any setup (except the unity web player installation). This version is hosted on our own server in our laboratory with IDtension, the narrative and interactive storytelling engine.

Figure 1. The 3D environment powered by Unity3D.

IDtension is the drama engine that dynamically generates all actions and dialogs in the story. IDtension is fed by narrative components of the scenario that are written in XML files which are translated into different situations; generating actions for the 3D environment. Contrary to typical branching storytelling engine and game engines, IDtension builds the story dynamically and allows an important "replayability" as situations can be resolved by different ways and not necessary by the player character himself. IDtension can manage several actions happening at the same time. We call it parallelism, meaning the user can be talking to a character while two others non player characters (NPCs) are doing something else together. Actions can also happen between NPCs while the user is doing nothing at all. The game is accessible online and secured with a login and a password. When a user successfully logs into our server, it starts loading the web version of the game and it starts an instance of IDtension for this user. Unity3D and IDtension communicate with TPC sockets and IDtension is sent a message to shut down when the user leaves the game.

Figure 2. Navigating within the 3D environment.

2.2 Navigation and Interaction

The playable 3D environment takes place in a specific part of the house, including the kitchen, the dining area, the living room and the entrance of the house.

Users can freely walk around this environment by using the mouse and keyboard of their computer (Figure 2). Arrows on the keyboard move the character and the right mouse button rotates the camera. When the main character is enough close to a NPC, it is possible to interact with him. The portrait of this NPC will drop down from the top center of the screen; a sign that the user is close enough. Interactions can be performed in different ways. Pressing the "Enter" key of the keyboard is the most common way, but you can also left click on the portrait of the NPC or left click on the NPC himself. NPCs aren't the only entities in the game the user can interact with. It is possible to interact with several items in the 3D environment; for example the fridge. This is the same process as with NPCs, when the user is close enough to one of these items, he or she will be able to interact.

A list of choices will then appear (Figure 3), representing all actions the user can undertake with this NPC or item. These choices are arranged depending on the current situation. For example, if a NPC asks a question to the user, the answer of this particular question will be on top of the list of choices. IDtension will consider the answer of this question more suited to the top of the list because the question has just been asked by an NPC. The selected choice is launched by Unity3D to IDtension and then returned to Unity3D in the form of consecutives actions, so called behaviors.

Figure 3. The list of choices.

It is possible to move the character with the mouse only. It can be performed by clicking on the ground with the left mouse button (Figure 2). The main character will automatically move to the pointed location, like in most Hack and Slash games. The same action can be undertaken on a NPC or an object: the main character will move and interact automatically.

This redundancy in navigation controls was designed to make the game as accessible as possible, to attract not only gamers but also people who are not accustomed to playing video games.

3. HOW TO PLAY THE SIMULATION?

A version of the game is accessible online from a platform. The address is: http://tbisim.unige.ch/portal/. Once on the page, there is a link to watch a YouTube video that explains how to play the game. Then you can click on the link called "Play" or "Jouer", depending on your chosen language: English or French. Enjoy!

4. ACKNOWLEDGMENTS

This research would not have been possible without the financial support from the Swiss National Science Foundation (J. Dumas and N. Szilas, principal investigators), the United States Centers for Disease Control and Prevention, and the Indiana Economic Development Corporation (Y. and J. Dumas, principal investigators).

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