From Motion Control to Emotion Influence: Controlling Autonomous Synthetic Characters in a Computer Game

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Abstract

This paper discusses the concept of "influence", as an alternative to "direct" control of game characters, describing how influence can be achieved in computer games. To illustrate the notion of influence we will present a game called FantasyA where players interact with it by influencing the emotions of their semi-autonomous avatars using a tangible interface called SenToy. We show how "influence" was built into this game, the role of SenToy as an influencing device, and the reactions of the users to this type of control.

1. Introduction

Gaming is a highly relevant application area for Intelligent Agents and Synthetic Characters. Nowadays, computer games invade our life bringing us a set of new experiences, driving us into first person fantastic adventures. Although purely fictional, characters in such games have a personality, likes and dislikes, that pulls us into the story and make us feel part of it. This paper briefly describes a new form of interaction between these characters and players in the game, through what we will call *"influence"*, an alternative to "direct" control of characters. To illustrate the notion of *influence* we will present a computer game called FantasyA where players interact in the game by influencing the emotions of they semi-autonomous avatars using a tangible interface called SenToy.

We show how *"influence"* was built in this game, the role of SenToy as an influencing device, and the reactions of the users to this type of control. Finally we will provide some discussion on the topic.

2. Interacting with Characters by Influence

About a decade ago, Negoponte [3] introduced the notion of "delegation" as a new paradigm for human/computer interaction. By contrast with direct manipulation, the idea of delegation is inspired by the image of an English butler, where instead of directly controlling all the actions in the interface, the user delegates some of his, perhaps more boring, activities to an interface agent that is clever enough to execute them autonomously. Although it took some time to catch its momentum, interface agents are now becoming more established and trustworthy as a human computer interaction medium. Still, trusting the agents and accepting not to control every aspect of the interface is something that many users are reluctant to do. The same happens to computer game's players. The idea of an avatar as the image of oneself (*Your digital you* [4]) in a virtual world that performs as one would responding to all the demands of the user is being challenged by work such as [4] or [1]. However, most games (of different genres) do not allow for the user to delegate activities and rely mostly on direct control of the avatars. Should the player be able to indirectly control other characters while in control of a specific avatar? For example, in Adventure / Role Playing Games, characters are an interesting mixture between the player's image of oneself and the actor in the story. However, in general, characters act always the same way leading to repetitive and tedious interactions. Wouldn't it be more challenging to let the character's personality take control in certain occasions?

2.1. Influence

If characters in a computer game become autonomous and interact with each other and with the players in an intelligent fashion, actions of such characters can be seen at as social actions. Considering both players and characters in a game as a society of agents (humans and artificial), we can follow Conte and Castelfranchi's work [2] on cognitive and

social actions as a base to describe the social relations established within the society. This leads us to the notion of influence that is a result of the heterogeneity of the agents (certain agents can influence other "week" agents). In our case, such heterogeneity comes not only from the presence of the human agent with more capabilities than our synthetic characters but also from the autonomy of the character itself. Given this notion, several properties emerge in this new interaction mode.

Influencing several states of mind: Although Conte and Castelfrachi consider the mechanism of influencing a cognitive one, nothing prevents us from considering the influencing at an emotional level as well. Indeed, influence, specially influence from the user to the agent, can be done on different attitudes. For example, the interaction can be designed so that users may influence the interests of their characters of even their emotions.

Influence is not direct control: When the user controls directly the character it bypasses any kind of decision making on the part of the character and determines all the actions it is about to execute. Differently, with influence, the user's digital self (the character) gains brains and acts autonomously as well. So, the user will try to "convince" the character to a certain behaviour by influencing its mental state. Note that such influence may or may not succeed and the character may do the behaviour we want or may decide otherwise. This indirection, at first annoying for some users, becomes a challenge later on in the interaction (as we will see in the results obtained).

Influence presupposes autonomy: Influence, as here described, presupposes autonomy on both parts, that is, users and agents. Thus, our agents must have their own goals and mental states. That is, for that autonomy, characters must have an internal state, which may include beliefs, goals, emotions, etc, explicitly managed and reasoned upon, leading to some goal oriented behaviour independently from the user's control. This allows for the agent to be in control, but still be able to be influenced.

3. Case study: FantasyA and SenToy

"*Influence*" was created in a computer game, *FantasyA*, where users play the role of an apprentice wizard who is challenged to find the leader of her/his clan in the land of *FantasyA* where the game takes place.

To "influence" the character players use *SenToy*, a wireless tangible interface with sensors in its body that allows the user to control the emotions of the character. The user must express appropriate gestures with the doll representing one of the following six emotions: anger, fear, surprise, gloat, sadness and happiness. To do that, SenToy is equipped with three sets of sensors: the accelerometers, which measure the acceleration that the SenToy is subjected to; analogical sensors, used to determine the limbs position; and digital sensors, used to indicate whether the hands of

the doll are placed over the eyes or not. The interaction with the game is achieved through this notion of emotional influence rather than direct control (see Figure 3). The results of the experiments done with the game have shown that users like the interaction mechanism and are intrigued by how the whole influence aspect works, in particular children.

Figure 1. One session of *FantasyA* **evaluation.**

4. Conclusions

In this paper we sketched the concept of influence and how it was implemented in FantasyA and SenToy. The results obtained with the evaluation of FantasyA and SenToy have shown that influence can be an interesting alternative to direct control of characters in games. However, the evaluation also shown that we need to keep the balance between indirect and direct control of the avatar and that timing is very important.

References

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