Prom Week Meets Skyrim: Developing a Social Agent Architecture in a Commercial Game

(Extended Abstract)

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ABSTRACT

We present and describe CIF-CK — a social agent architecture that models reasoning about persistent social interactions to improve narrative engagement and play experience for human interactors. The architecture is inspired by McCoy et al's *Comme il-Faut (CiF)* architecture that represents rich social interactions between agents including feelings, social and relationship contexts, and longer term mood. The key contribution of this work is in adapting the richness of social interactions from CiF to a first-person interaction experience and a released distribution of its implementation on the Skyrim game engine.

Keywords

Authoring tools for Agent Modeling; NPC Agents in Games; Social Architecture Model; Social Modeling in Agents

1. INTRODUCTION

Modern video games have reached a new level of graphic fidelity. Furthermore with the rise of popularity of new technologies such as Virtual Reality and Augmented Reality, gamers are more immersed than ever within virtual worlds and virtual characters. With the level of real life likeness of the game world increasing so does the player expectation of real life like interaction [4]. This expectation is extended to the characters that compose the environment, typically called Non Playable Characters (NPCs), because their behaviour is defined by the programmer.

The credibility and believability of NPCs requires characters to have basic human traits like emotions and the ability to make decisions on their own [5]. One key aspect for agent models is affinity with the player's social concerns and behaviours [3].

With the amount of human interaction in AAA games, these provide a rich sandbox to deploy, gather data on, and validate agent models and programs. Most modern day AAA video games are heavily dependent on a high number of NPCs and rely on the Player's interaction with them to advance the game's narrative. Unfortunately, most of the NPCs do not exhibit deep social reasoning in player interactions and most of the times are simply frozen in time, repeating the same action, if any, over and over again [1].

Modern social architectures/models, originating from academic research groups, have the potential to transform game NPC interaction to open up rich narrative design spaces for players to explore. These models allow the system to automatically manage and keep up with the complexity of social interactions, reducing the number of experiences that need to be explicitly authored [7].

Academic research on AI in games and commercial game AI development efforts are rather disjoint and there is a wide divergence in methods and results. This is the result of academic research and commercial game development trying to solve different problems: academic researchers want general solutions to generic and preferably deep problems, whereas commercial developers want something that works well enough and looks good to the player in a particular context[11].

This project's goal was to develop and implement a social architecture model, inspired in academic research, in a modern and commercially successful video game and investigate its impact on player experience. We choose to implement the social architecture in a popular Role Playing video game: "The Elder Scrolls V: Skyrim"[10], due to its popularity and high "mod-ability".

2. SOLUTION ARCHITECTURE: CIF-CK

Our adaptation of the Comme il Faut architecture to RPGs in general and to the Creation Kit is called the **CIF-CK** (Comme il Faut Creation Kit) architecture.

2.1 Social Exchanges

In most Role Playing Games everything revolves around quests. From complex main narrative storylines to simple "collect some plants" missions, at least one quest needs to be started and finished.

The primary knowledge representation element in CiF is the Social Exchange, a collection of patterns of interaction where the exact performance and social outcome varies based on the personality-specific attributes of the characters involved and the current social state [6].

The similarity between Quests, in RPGs, and Social Exchanges, in CiF, allow us to adapt one to the other. We can use Quests the same way Social Exchanges are used in CiF, with some adaptations. This is shown in Table 1.

CIF	Function	CIF-CK
Name	Unique Identifier	Quest ID
Intent	Pretended Social State Change	Used once the Quest has finished
Pre Conditions	Conditions for it to happen	Quest Start Conditions
Initiator Influence Rules	Character's Desire to initiate the exchange	Set of Rules
Responder Influence Rules	Target's Reaction to the Exchange	Set of Rules
Effects	The resulting consequences of the Exchange	Applied in the Final Stage of a Quest
Instantiations	Performance of the Social Exchange	Dialogue between NPCs

Table 1: Social Exchanges: From CiF to CIF-CK.

For example, lets say that Sarah wants to Flirt with John. The Quest Flirt is started and its Initiator is Sarah and its Target John. The instantiation of the Quest is composed by a conversation between Sarah and John in which Sarah flirts and John responds. Depending on the response different Social State changes might be applied. These include improving the NPCs' relationships with each other and even adding or removing Status. Finally, some Trigger Rules might be fired. These would bring even more changes to the Social State. In our example, if the Flirt Social Move succeeded, John's attraction for Sarah increases, in turn, Sarah's beliefs that John likes her would also increase.

2.2 Characters

In order to fully capture CiF's architecture we also need to improve upon the Characters created in Skyrim (and in most RPGs). In order to capture that additional behaviour we have implemented certain key variables aspects such as the ability to have a personality through its Traits and Status.

2.3 Social State

In order to store all the data the Social State captures we use a Static entity that can be accessed by anyone at any time. This entity describes the Relationships between characters along with a record of what has already happened in the world.

2.4 Trigger Rules

In Prom Week, one of the examples of implementation of CiF [8], Trigger Rules can be "fired" at any point during the game [6]. In order to be more efficient and avoid stressing the Game Engine, CIF-CK only verifies the trigger rules when a Social Exchange ends, as it is the only component that directly influence the Social State.

2.5 Social Networks and Beliefs

In Prom Week there are three networks: Buddy, Romance and Cool [8]. Our Model supports any number of different Social Networks, in our implementation there are two: Attraction (Romance) and Friendship (Buddy). These networks model the relation of social attraction and friendship, first studied by Moreno [9], which reflects the affective ties that one person establishes with the others.

In CIF-CK we added a new feature to the Comme il Faut architecture. We considered that the Social State is something Characters perceive, however, it might not be the actual reality [2]. For example, Sarah might think John likes her, despite the fact that John actually hates her. This falls under the Social Networks category, specifically in the Private Feelings each characters has for each other segment.

Figure 1 gives an overview of the CIF-CK architecture and where each of the CiF's elements are.
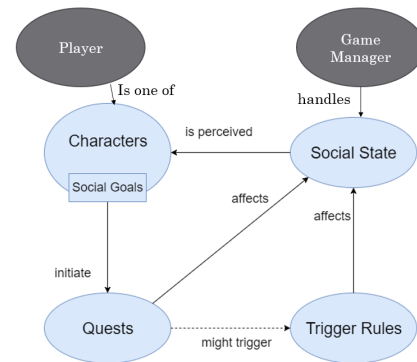

Figure 1: Simple representation of CiF-CK components and the relation between them

3. CONCLUSIONS

We presented and described CIF-CK, a social agent architecture that models reasoning about persistent social interactions to improve narrative engagement and play experience for human interactors. Its implementation led to the development of a mod that was published online, for the video game "The Elder Scrolls V: Skyrim".

The resulting Mod [1] was and still is quite successful. It was released in late August 2016 and in only two months had already been downloaded by over 6 000 different players reaching a 93 % approval rating on Steam.

The CIF-CK architecture should be applicable to any Computer RPG, as long as its engine supports some common features like Quests and controllable NPCs. The specific implementation in Creation Kit is immediately extendable to games like Fallout 3 and 4.

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[1]http://steamcommunity.com/sharedfiles/filedetails/?id=751622677

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