

Social believability in games - the early years

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1. INTRODUCTION

The workshop on Social Believability in Games had its first meeting during the 10th ACE 2013 conference, at the University of Twente, Netherlands. The publications then presented different underlying aspects important for believability in games, ranging from tools for evaluating player experiences [11], to design considerations for a police interview training game [2], to enhancing the social believability in agents through culturally specific trust-building features [1], to Meta-techniques in serious games and their effects on learning and believability [7] and finally NPCs with dynamic identities [3]. What could be seen in the presentations held at the workshop is that there is a growing interest in creating possibilities for the game medium to mature and open up for new directions, directions that rely on social believability. The second workshop, of which this paper is part even if it describes the workshop, is organized at FDG2014.

2. SBG2013@ACE

Why measurements of the player experiment is important in this context can be explained in that, believability in games does not only rely on the computer generated population in the game, but also on simple rules that games need to comply, such as consistency in how feedback is presented, but also in regards to the players expectations. Sometimes the actions of NPCs cannot be explained or understood by players nor does cutscenes or dialogue give clues to the rationale behind certain NPC behaviours, which is something [11] argues leads to an unnecessary hold-up in immersion, something that should also be a problem for the believability of the game.

Believability in games can be addressed in many different ways, both from a general game perspective, how the game fosters interaction on different levels but also from the interplay between NPCs and players. Interaction in games usually consist of the possible actions that are programmed in the behaviour of NPCs, but also in the scripted dialogues that often in combination with cutscenes constitute the narrative structure of the game. In one publication from the previous SBG workshop the focus on narrative and dialogue was more pronounced. The publication deals with a training scenario for policemen learning the basics of interview techniques, where there is a need for the agents in the game to act in accordance with the learning goals.

Related to the issues of story and dialogues, [2] draws the attention to narrative in their publication on how to build an architecture that would support the training scenarios for police officers undergoing interview training. The proposed architecture is connected to certain learning goals, and also takes into account the non-cooperative aspects of a person being interviewed, or interrogated. In a sense the agents are dynamic, being monitored by a meta-agent that are both aware of the learning goals of the game, and influences the behaviour of the interviewee (NPC) to

let the players (policemen undergoing training) attain specific learning goals, thus dynamically adjusting some of the behaviours of the agent. The dynamics in the publication builds on two levels were the first level is related to "Leary's rose" [6] that is a categorization of interpersonal stance measured in affect and power, that describes "interpersonal reflexes" were two conversational partners influences the conversation in certain ways. As a consequence, the effect of negative interpersonal reflexes can be neutralized using Table of 10 by [4]. The table of 10 constitute the second layer of the dynamics in the publication and is also connected to the learning goals of the game. The notion of a dynamic agent that can alter their behaviours is something that can be seen as a central theme, and is also one of the main drives behind the publication of [3] with dynamic identity in NPCs.

Dimas and Prada [3] reflects about the increasing quality of computer graphics, motion capture technologies and overall realism in the graphical areas, qualities that should also be reflected in the behavioural repertoire of NPCs, if the graphical aspects should not be in vain. One solution to create dynamic NPCs with increased believability is through different identities, in the publication facilitated by The Dynamic Identity Model for Agents (DIMA) that was developed to provide agents with a dynamic identity determined by the social context. The relation between social context and social identity therefore enables different behaviours of the NPC to reflect the relation to other NPCs. Other factors influencing the behaviour of the NPC is the identity salience that takes into account two factors; normative fit and comparative fit, that further adds a connection to the social context.

Linsen et al. 's "What Is at Play? Meta-techniques in Serious Games and Their Effects on Social Believability and Learning" is a more speculative article discussing the advantages and disadvantages of using techniques inspired by LARP out-of-character techniques to make sure all players understand the state of the game world and negotiate over the action space and interpretation of the developing story. While the authors discuss this may disturb immersion and thus learning effects, they feel the techniques can be implemented in less intrusive ways. However, while the out-of-character techniques may increase the social believability it is of an entirely different nature than most of the other work presented at SBG, focussing on in-character behavior, dialogues or nonverbal behavior that is socially believable instead.

In "Theoretical Considerations for Enhancing Social Believability through Integrating Culturally Specific Trust-Building Cognitive Features in Non-Playing Characters " by Borit, Vanhee and Olsen [1] describe how they plan to integrate 2 theoretical models; On the one hand the conceptualization of "culture" as done by Hofstede et al [5] and on the other hand

models of trust and the cognitive processes of building trustworthiness. The authors state that calculations by their model produces reliable distributions of different cognitive trust-building processes based on the cultural dimensions from Hofstede et al. [5]. The culture-trust model might be useful, however, the paper lacks a detailed description as well as a description of the implementation into a game or simulation.

3. SBG2014@FDG

In “The importance of social identity when mimicking behaviour in a Social Dilemma game” [9] the focus is on social identity as defined by Tajfel [12] amongst others. In this work, social identity is linked to teams competing for resources. Using a priming factor (team members share the colour of their clothes), it is stipulated that social identity (or more accurately identification of team members) as team members is enhanced. Given that we see other agents as team members, we have more accurate predictions of their behaviour (given that team membership via social identity is expressed in similar behaviour and a willingness to cooperate with other team members). This hypothesis is tested using data from a gaming experiment.

The game is here an experimental tool to test the hypothesis based on theoretical predictions. The implementation of player agents based on the model can be used to build more socially believable game agents. Currently this is not the goal of the game. The observables are agent behaviour, there is no communication between the players (human or artificial) in the game. The behaviour to explain or produce are the indication of benevolence and cooperation towards certain other agents that can be identified as team members due to their utter appearance.

Li et al. [8] present in “Data-Driven Alibi Story Telling for Social Believability” ideas on how NPCs can produce believable background stories (or alibis as they are called in the article). The behaviours in the background stories are to be in synch with the socio-cultural setting in which they supposedly take place. Real world data from the analysis of 2 corpuses (Google N-gram and books in Project Gutenberg corpus) are used to create coherent and believable alibis. The output of the NPCs is text, essentially believable discourse rather than actions. The story contains believable events in a believable sequential order. NPCs also can produce these stories reflecting positive or negative sentiments and be more or less concise. The origin of texts (fiction versus nonfiction) in the Google N-gram corpus is used to produce more or less story-like alibis. The system appears not to have been implemented yet, let alone be integrated into a game.

In “Social Gaming as an Experimental Platform”, Seif El-Nasr et al. [10] present a game in which NPCs are socially believable personalities which Psychologists in a Wizard of Oz setting can manipulate to run experiments on the relationship between non-verbal behaviour and trust. The internals of the agents consist of different modules: personality, affect, temperament, and a planning system. The output, apart from the chosen action, is

nonverbal behaviour: body posture, gaze, facial expressions etc. The system is under development with respect to the mapping of the nonverbal behaviours, personality and situation. Validation is planned via crowd-sourcing video analysis of game sequences.

4. DISCUSSION

As can be seen in the above publications there are different possible ways of working with believability in games, and that directly transfers to the multimodality of computer games. Of the more pronounced areas we can see the holistic approach to games as an overarching theme, where NPC behaviour, story and dialogue are part of the larger whole. If we were to define sub areas of research relevant for continued research they could be loosely defined as focused on:

- the usability aspect of games
- NPC behaviour
- narrative and dialogue

Main areas of application of social believable games agents seem to be games for learning/serious gaming and games for theory testing, close to social simulation research but using a game with study participants instead of pure simulations. Most work presented has a clear but relatively unsentimental base in theories from social and behavioural sciences. The embryonic community also has a large degree of openness to these different application areas, research aims and theoretical frameworks. We are looking forward to see what the next few years will bring us.

5. REFERENCES

- [1] Borit, M., Vanh e, L. and Olsen, P. 2013. Theoretical Considerations for Enhancing Social Believability Through Integrating Culturally Specific Trust-Building Cognitive Features in Non-Playing Characters, SBG2013 proceedings.
- [2] Bruijnes, M., Kolkmeier, J., Op Den Akker, R., Linssen, J., Theune, M., and Heylen, D. 2013. Keeping up Stories: Design Considerations for a Police Interview Training Game, SBG2013 proceedings.
- [3] Dimas, J., and Prada, R. 2013. Social Behaviour in Games: Dynamic Identity in NPCs, SBG2013 proceedings.
- [4] Giebels, E.. 2002 Beinvloeding in gijzelsingsonderhandelingen: de tafel van tien. Nederlands tijdschrift voor de psychologie 57, 145-154.
- [5] Hofstede, G. Hofstede, G.J., and Minkov, M. 2010. Cultures and Organizations: Software of the Mind, Third Edition, SAGE.
- [6] Leary, T. 1957. Interpersonal diagnosis of personality. New York: Ronald Press.
- [7] Linssen, J, Theune, M., and de Groot, T. 2013. What Is at Play? Meta-techniques in Serious Games and Their Effects on Social Believability and Learning, SBG2013 proceedings.
- [8] Li, B., Thakkar, M., Wang, Y., and Riedl, M. 2014. Data-Driven Alibi Story Telling for Social Believability, SBG2014 proceedings.
- [9] Loureiro, A., and Martinho, C. 2014. The importance of social identity when mimicking behaviour in a Social Dilemma game, SBG2014 proceedings.

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- [10] Seif El-Nasr, M., Dinh Nguyen, T.-H., Carstensdóttir, E., Gray, M., Isaacowitz, D., and Desteno, D. 2014. Social Gaming as an Experimental Platform, SBG2014 proceedings.
- [11] Strååt, B., Johansson, M., and Warpefelt, H. 2013. Evaluating game heuristics for measuring player experience, SBG2013 proceedings.
- [12] Tajfel, H. 1978. Differentiation between social groups. Academic Press London.