

Adaptive Self-Feeding Natural Language Generator Engine

Jovan David REBOLLEDO MÉNDEZ and Kenji NAKAYAMA

Graduate School of Natural Science and Technology,
Kanazawa University, Kanazawa-shi, 920-1192 Japan
{jovan,nakayama}@leo.ec.t.kanazawa-u.ac.jp
<http://leo.ec.t.kanazawa-u.ac.jp>

Abstract. A Natural Language Generation (NLG) engine is proposed based on the combination of NLG and Expert Systems. The combination of these techniques paves the way to employ user defined behaviors in virtual worlds as input to an expert system. Adaptive Algorithms can then be used to retrieve information from the Internet to feedback the user via the NLG engine. The combination of these AI techniques can bring about some benefits such as believability in the interaction between AI-driven and human-driven avatars in virtual worlds.

Key words: NLG, Expert System, Machine Learning, Believable Agent

1 Introduction

By years it's been tried to incorporate Artificial Intelligence into games, educational systems, or some other different kinds of interaction [1] between a human and a computer, sharing a common pattern: to develop *intelligence* that would give certain degree of independence, and decision-making to the current system when interacting in an autonomous driven behavior with the user. There are also other systems that measure user's preferences by ranking interaction with links or applications. In order to get a better interface between users and systems, the concept of believable has been very important[2]. In this paper it is explained a way an user and an agent interact by giving believability to the agent while keeping some common user's learned *traits*, by using a Natural Language Generation [3] and adaptive learning expert system [4] to achieve those objectives. Such a system would give a way to provide relevant categorized information from learned criteria to its user, permitting to preserve user's patterns.

2 Natural Language Generation Engine method

The proposed methodology for an *self-feeding NLG engine* is: 1) The agent is initially fed with interaction and batteries of questions to the user, and an expert system will categorize such information provided by the user and fill up the user's *knowledge bases* of common patterns; so the input data would serve for

getting to know user's preferences; 2) After that process, the system is trained by Artificial Neural Network, where new information is presented and using a supervised learning method it would re-categorize new data; during this step, the system would gain some randomness, which would enable *believability* to the proposed agent; 3) Then, it would have a module for retrieving data that matches with its *knowledge*, from web (wikis, newsfeed, blogs, etc.), and using machine learning to select in accordance to the previous *classified knowledge bases*; 4) Finally, by a dedicated module that interacts between the knowledge bases and the real time information, all the system would be ported to an embodied IVA, and using a parser language that identifies the current subject, the system would present current themes, news, and comments about different topics, permitting a *conversational mode* with its original user, so it will help him achieving certain tasks.

Fig. 1. Methodology of the proposed self-feeding believable NGL Engine.

3 Future work

This proposed engine is a first stage of more complete AI interaction approach called *iTwinning System*, a dedicated personal agent that learns some user's behaviors, *generalizing* from their interaction, to assist him achieving certain tasks in a virtual world or the internet, as well as being helpful, and *loadbalancing* work, and preserving specific user's characteristics. The plan is to conduct a set of test to users, providing a pool of questions-answers, so each user would select his preferences, so by a the construction of a generically algorithm it would separate the relevant information, and by a programmed robust feeder it would retrieve information from Internet.

References

1. Schröder, M., Cowie, R. Developing a consistent view on emotion-oriented computing Machine Learning for Multimodal Interaction Washinton, USA (2006)
2. Bates J. The role of emotion in believable agents Communications of the ACM Volume 37, Issue 7 (1994)
3. Strong C., Mishra K., Mehta M., Jones A., Ram A. Emotionally Driven Natural Language Generation for Personality Rich Characters in Interactive Games 3rd Conference on AI for Interactive Digital Entertainment CA, USA (2007)
4. Wiriyagoonkasem S., Esterline A.C. Adaptive learning expert systems Southeastcon 2000. Proceedings of the IEEE Nashville, TN, USA (2005)