
Editorial

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Biographical notes: Isabel Machado Alexandre is an Assistant Professor at the Instituto Superior de Ciências do Trabalho e da Empresa, Lisbon, Portugal and a senior researcher in the 'We, the Body, and the Mind' Research Lab of ADETTI since 2005. Previously, she was a member of the Intelligent Agents and Synthetic Characters Group at INESC-ID. Her current research and previous projects are focused on topics like narrative intelligence and artificial intelligence in education. Her PhD in Computer Studies, from the University of Leeds, UK, investigated the benefits of introducing a narrative intelligence approach to intelligent learning environments. She has served as a member of many international conferences and workshops.

Paul Brna is the Director of the SCRE Centre at the University of Glasgow. He has worked in the area of narrative and interactive learning environments for around 12 years. In 2000, he initiated and organised the Narrative and Interactive Learning Environments (NILE) conference series. His research includes work on emotion and empathy in learning. In addition to work on other projects, he is coordinating an EPSRC/AHRC funded research network to promote the study of drama and narrative within ICT – 'Drama and Performance for Personal Pleasurable Learning Environments' (DAPPLE). He was a principal investigator on the NIMIS project during which time he led the development of the T'rrific Tales story creation environment at the CBLU, Leeds University.

Ana Paiva is a Research Group Leader at INESC-ID and a Professor at the Instituto Superior Técnico, Technical University of Lisbon. She is well known in the areas of intelligent agents, user modelling, and artificial intelligence applied to education. After her PhD in the UK (University of Lancaster), she worked in Germany (in GMD) and in France (CNRS-COAST team at the ENS of Lyon). In 1996, she returned to Portugal where she created a research group on intelligent agents and synthetic characters. Her research is focused on the affective elements in the interactions between users and computers and in particular in the interaction with synthetic characters. She has served as a member of numerous international conferences and workshops. She has (co)authored over 80 publications in refereed journals, conferences, and books. She coordinated the participation of INESC-ID within several Portuguese and European projects, such as the Storyteller (Portuguese Science Foundation), IDEALS (funded under the Telematics programme), NIMIS (an I3-ESE project), DiViLab, Safira, VICTEC and COLDEX (IST – 5th Framework), among others.

1 Introduction

Narrative has been an important form for the transmission of knowledge across generations, and is innate to human nature. Narrative is also a valuable vehicle to structure knowledge and to help us in the process of meaning making. Due to the explorative and complex nature of narrative, an Intelligent Learning Environment (ILE) based on a narrative approach can promote several kinds of activities for learners:

- co-construction: participate in the construction of a narrative
- exploration: engage in active exploration of learning tasks, following a narrative approach and trying to understand and reason about an environment and its elements
- reflection: engage in consequent analysis of what happened within the learning session.

By applying a narrative approach in the development of an ILE, it is possible to attain an application that may help the learners to share ideas and points of view, to experience a particular situation by engaging in role-playing, or even to post-reflect on an action taken within such an environment.

The papers for this special issue had their genesis in a workshop held in conjunction with the 12th International Conference on Artificial Intelligence in Education – July 2005, Amsterdam.

The themes presented in this special issue cover basically the following topics:

1.1 How are narrative aspects of the learning environment represented and developed in the ILE design process?

This topic is approached by Marsella, Waraich and Brna, and Mor and Noss. The first author presents the design process of a specific kind of ILE, an Interactive Pedagogical Drama (IPD), the second authors present a Narrative Centred Informant Design (NCID), and the third authors illustrate a narrative-oriented approach to the design and analysis of a computational system and a set of activities for mathematical learning.

Stacy Marsella introduces the concept of IPD and identifies central issues for its design such as:

- 1 the nature of drama
- 2 the relation of the drama to the pedagogy
- 3 the role that learner plays in such drama.

For the second topic, the author suggests that there should be a strong relation between the narrative events and pedagogy regardless of how the story unfolds based on the learner's actions – *strong narrative entanglement*.

For the third topic, the author suggests the notion of *pedagogically mediated involvement*, meaning that the learner's sense of presence in the environment and his affective response to it needs to be mediated by pedagogical concerns.

As for the first topic, there are a number of different possibilities, especially as to what concerns determine how the technology is applied to deploy the narrative: branching, interactive, etc.

Waraich and Brna take a different approach termed NCID, which has been developed by taking into account an analysis of narrative theory and computer games development, and incorporates dramatic and narrative devices that are meaningful to the target learner group. The authors end up with the conclusion that the incorporation of narrative in the design of learning environments can act as a motivating and facilitating factor to portray the message of such environment.

Mor and Noss try to bridge the gap between narrative and formal language, by positioning programming as a mediating linguistic form. They have proposed a narrative-oriented framework for design and analysis of mathematical learning activities and the computer-enhanced means of supporting them. The main elements of this framework are context, voice, plot, and moral (in the sense of an implicit conclusion). This framework was used to analyse a software system and the activities it affords. The authors argue that their studies emphasised the importance of narrative construction, and the potential of programming as mathematical narrative. However, they do not want to prescribe a specific method, but they found that in order for abstraction to take place, the learner must be able to relate to the story.

1.2 *How can good quality relationships be maintained between people directly and indirectly engaged in the narrative?*

This topic is approached by Michela Cozza in her paper, where she explores how computer technology can be used to develop and sustain relationships between expert and novice women in the IT field by having them share experimental narratives about their work. From the experiments conducted, she demonstrated the added value provided by narrative, and its importance for bridging the gender gap in computer science.

From another perspective, Zhang and colleagues investigated the impact of adding affect-detection to an existing e-drama program, a text-based software system for (human) dramatic improvisation in simple virtual scenarios, for use primarily in learning contexts. The system allows a human director to monitor improvisations and make interventions, for instance, in reaction to excessive, insufficient, or inappropriate emotions in the characters' speeches. It is aimed at detecting affective aspects (concerning emotions, moods, rudeness, value judgments, etc.) of human-controlled

characters' textual 'speeches'. This research project makes a contribution to the issue of what types of automation should be included in interactive narrative environments, and as part of that the issue of what types of affect should be detected (by directors, etc.) and how. With this, the authors are developing an automated replay of the original drama improvised by actors, with the possibility of changing certain character features, supporting therefore reflection on narrative coconstruction and its affective dimension.