

Distributed drama management: integrating levels of narrative responsibility

Allan Weallans¹ and Sandy Louchart¹

Abstract. Work on drama management may be broadly divided into two categories of approach: namely, the top-down plot-based approach and the bottom-up character-based approach [1]. The relative strengths and weaknesses of these approaches are well-established: the top-down approach, in general, is strong in the areas of structure and plot, but has weaknesses in character consistence and contextualisation; the bottom-up approach, conversely, strong in consistence and contextualisation, but has weaknesses in structure and plot. It is widely agreed that Interactive Storytelling (IS) would benefit from an integration of the different levels of approach. We herein introduce the concept of Distributed Drama Management (DDM), by which autonomous character agents would negotiate between them action selections that would contribute to dramatic narrative structure, with the aim of working towards such an integration.

The DDM concept differs from previous work in that the actions that cause the story to unfold can consist of various types of intervention at several levels of story representation. Through assessment of the current user experience and the needs of the story (in accordance with both established dramatic rules and authorial preferences), a DDM system could make a decision on whether the experience would at that point best be served by plot-level or character-level interventions, or by an emergent approach. Fundamentally, the DDM concept proposes research into the causal relationships between levels of story representation, as this could determine the way in which a DDM system would prioritise a particular type of intervention over another.

The primary research domains currently considered for work on DDM are Interactive Storytelling Systems (ISSs) and Synthetic Actors (SAs). One area of interest to DDM is research that offers insight into how the relative efficiency of given interventions may be quantified, and of how the user experience may be assessed. To this end, work on DDM takes place within the context of several different works on user monitoring. One such work is David Thue's work on monitoring user behaviours in response to narrative stimuli in game and/or story environments [2]. Another is Tychsen et al's work on modelling game masters' assessment of the players' experience in role playing games [3]. Another still is the body of work on physiological monitoring [4] (such as electroencephalography (EEG), electrocardiography (ECG) and galvanic skin response (GSR)) with respect to user experience of games and stories.

Aside from quantification of narrative impact, DDM research must also extend to the technological boundaries of Intelligent Agent (IAs) planning activities. In a synthetic character-based environment, a large proportion of changes directly occur as a result of character actions and decisions. The character therefore acts as the dynamic factor with which story agency must comply. Irrespective of their mode of control (e.g. autonomous or otherwise), it is essential to identify a mechanism that would

permit to dynamically shape narrative agency with respect to characters' decisions.

As the DDM concept is an integrative approach to drama management, encompassing all levels of approach, it is necessary that a DDM system be able to appropriately distribute narrative responsibilities according to current needs. Work on DDM will therefore involve identifying different models of distribution (e.g. models that emphasise stricter central control or models that allow more emergence) and which strengths they emphasise, and determining under what conditions these models would be most suitable.

In order to successfully implement a DDM system, we believe it is necessary to a) Identify the different levels at which narrative intervention can be administered. b) Conceptualise the various modes of interactions for each level and determine their potentials for managing a user narrative experience. c) Identify factors other than narrative-based ones influencing the selection of narrative elements (e.g. thematic concerns, training requirements) d) Understand the relationships between all levels and how they actually do affect each other on both a theoretical and practical basis.

In summary, the aims of our work on the DDM concept are to perform research into the causal relationships between different levels of story representation. We aim to do this by assessing the efficiency and impact of interventions at different levels, and by identifying a planning mechanism that will allow the maintenance of a story structure through these interventions.

REFERENCES

- [1] D. Sobral, I. Machado, A. Paiva. Managing Authorship in Plot Conduction. In: *Procs. 2nd Int'l Conf. on Virtual Storytelling (ICVS'03)*, Toulouse, France. (2003)
- [2] D. Thue, V. Bulitko, M. Spetch. PaSSAGE: A Demonstration of Player Modeling in Interactive Storytelling. In: *Procs. 4th Conf. on Artificial Intelligence and Interactive Digital Entertainment (AIIDE'08)*, Palo Alto, CA, USA. AAAI Press (2008)
- [3] A. Tychsen, M. Hitchens, R. Aylett, S. Louchart. Modeling Game Master-Based Story Facilitation in Multi-Player Role-Playing Games. In: *Papers from the AAAI Spring Symposium Intelligent Narrative Technologies II*, Stanford, USA. (2009)
- [4] G. N. Yannakakis, J. Hallam. Entertainment Modeling in Physical Play through Physiology beyond Heart Rate. In: *Procs. Int'l Conf. on Affective Computing and Intelligent Interaction, Lecture Notes in Computer Science*, vol. 4783, pp. 256-267 Lisbon, Portugal. Springer-Verlag (2007)

¹ Heriot-Watt University, School of Mathematical and Computer Sciences, Edinburgh, EH14 4AS. Email: aw119@hw.ac.uk, sandy@macs.hw.ac.uk.

