Contextual Drama Facilitator for Digital Games

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Abstract. In this position article, we discuss the representation of narrative trajectories in digital games and investigate the possibility for Non-Player-Characters (NPCs) AI controllers to react contextually to narrative situations. We propose to define the foundations of a context-based model for NPCs and the remit of intervention of such an approach.

Keywords: Interactive Digital Narratives, Digital Games, Artificial Agents, Affective Agents

1   Introduction

Over the last 20 years, digital games have made significant technical strides (hardware and software) which increased both their influence and popularity. Digital games have also conceptually evolved in terms of storytelling and the role and importance of narrative design has greatly increased in mainstream productions where AAA releases offer players increasingly complex and intertwined narrative structures (i.e. non-linear storylines [1, 2], characterization [2] and environmental storytelling norms [3]).

Current storytelling approaches in the games industry offer narrative flexibility but do not generally address key problems associated with Interactive Digital Narrative (IDN) research such as the relationship between character consistency and coherent narratives structures, an issue inherently linked to the notion of narrative context [5]. Character consistency refers, in this instance, to the believability of NPCs is in making rational decisions whereas narrative coherence relates to a character's ability to react to events in a manner coherent with the player's perception of that character's personality and motives. The development of dynamic characters is key to IDN [15] research and the conceptualization/implementation of mechanisms allowing NPCs to meaningfully adapt to player experiences is an open research question.

In this position article, we propose to investigate the conceptualization of context-based narrative trajectories towards driving the behavior of NPCs in games, thus providing mechanisms for managing character consistency and narrative coherence in digital games.

2   Context-based Narrative Trajectories

In studying narrative context across the digital game spectrum, we identified a model of narrative context representation; specifically, narrative, character, and envi-

ronment layers which targets players or player characters through implicit and/or explicit channels of communication [Figure 1 below].
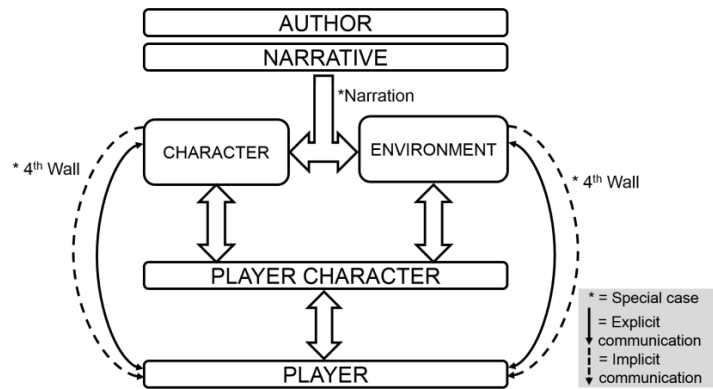

Fig. 1. Model of Narrative Context (Layers, Channels, and Targets)

Narrative contextual information is expressed through authors, characters and environments and communicated to the player through a number of channels such as a narrative layer (communicating the authorial intent), a character layer and an environment layer. There are a number of ways through which context can be represented and exploited by players and NPCs.

Firstly, by targeting a player's desirability for an action, one could support NPCs in making better decisions in relation to a player's experience (narrative or otherwise). For example, a NPC could be aware of a player's reluctance to explore dark areas but decide to bring the player to a dark forest if its intention is to create tension and conform to some level of authorial intend that aims to unsettle the player. Secondly, equipping NPCs with the means to understand the impact of an action on the player would lead to a better consideration of contextual information with regards to the overall game narrative. A NPC might understand the authorial necessity for romance for instance. Whilst there might not be any romantic action available in its action repertoire, understanding that a flirty action could be related and relevant would allow the NPC to choose the next best action with regard to the contextual relevance of the situation. Thirdly, providing NPCs with an understanding of its environment would lead to location awareness and add an environment-based contextual dimension to a NPC's action decision mechanism, thus allowing for the consideration of desirability and undesirability of actions from an environmental perspective.

We argue, in this article, that if one was to structurally implement these considerations NPCs could potentially display a heightened sense of character consistency and narrative coherence. Digital games will often exhibit one or two of these premises but never exhibit all while they tend to depict consistent characterization, they are often deficient in terms of narrative coherence or do not take fully into account the intention of a player's actions, and vice versa. The next section describes the implementation of

an AI controller which aims to contextualize narrative information from all aspect of narrative communication, namely; authorial intent, character and game environment.

3   Authoring Contextual Narrative Trajectories

The Contextual Drama Facilitator (CDF) system is a dynamic action-selection mechanism developed for affective agents aimed at relaying narrative contextual information to NPCs AI controllers in real-time. In line with the description above, the CDF action selection mechanism determines a set of desirable narrative trajectories expressed through affect/emotional targets for NPCs, allowing for the expression of authorial, player and environmental considerations in NPC decision-making.

3.1 Authorial Trajectories Overview

The CDF system has been designed for digital games or IDNs of episodic nature for which each chapter is include a series of narrative trajectories or targets derived from a list of pre-authored typed-based, hierarchical 'tags'. These narrative tags effectively assist the CDF system in selecting actions that best fits both the emotional and contextual relevant trajectories for each chapter. Agent actions are allocated tags in the tag hierarchy in order to facilitate a distributed approach to the overall drama management (DDM) [5]. In the example below [Figure 2], the player character targets for the chapter are to:

- Raise joy from -1.0 to 2.0 (a seriously positive action)
- Aim to do this through a romantic-serious action (such as kissing)

> Chapter1 6
> JOY -1.0 2.0
> **Tag** romantic-serious
> **GoodReaction** 0.1/0.3
> **BadReaction** -0.1/-0.3
> **TagsHierarchy** /good //romantic ///romantic-playful ///romantic-serious ///romantic-passive //friendly ///friendly-playful ///friendly-serious ///friendly-passive /neutral //passive /bad //aggressive ///aggressive-playful ///aggressive-serious ///aggressive-passive //depressing ///depressing-playful ///depressing-serious ///depressing-passive
>   **Location** Office romantic/-0.3 romantic-playful/-0.5 aggressive/-0.1
>   **Location** Club depressing/-0.2

Fig. 2. Authorial trajectories

3.2 Best Fit Emotional and Contextualization Action-Selection Mechanism

Once both the authorial trajectories and tags for actions and environments are set, the system will attempt to find a best-fit scenario for each agent action relevant to the tag hierarchy. Such that if a romantic serious action is the target but none exist, what is the next best fit? In this case, if a romantic serious action is not acceptable as a target in the current location, what is the rating of the root tag romantic and all of its associated children? In practical terms, the CDF system aims to take the emotional rating for actions, derived from affective appraisal (double appraisal), and outset it with the modification factor of the tag relevance to the authorial trajectory of the

chapter. Such that, it selects the best fit actions for simulation in the Distributed Drama Manager and pick the action scoring the highest for authorization.

3.3 User Adaptation

The CDF system does not only operate on a static level (responding to tag relevance only) in that it follows the author's intentions entirely. In fact, the system supports a level of dynamic user feedback in adjusting the relevance of agent actions, whilst remaining consistent to an agent's tendencies, and respecting the coherence of the narrative an author wishes to tell (authorial trajectory). It achieves this by adjusting the scaling factor of the tag hierarchy set out by the author, based on how the user responds to agent actions. For example, if a player has shown a history of dislike for romantic gestures from a particular NPC, the CDF will adjust accordingly by targeting the next best-fit action relevant to the authorial trajectories. In effect, it allows for a basic level of dynamic modification to the DDM decision making process at runtime.

4 Conclusion

In this position article, we investigated the nature and mechanisms of the narrative implications of context or authorial trajectories from the perspective of digital game productions. We discussed the implication of contextual representation and facilitation for the development of NPCs and game AI for digital game and interactive digital narrative designs. Finally, we discussed the foundation for advanced NPC game AI by enhancing NPCs action-selection mechanism in order to allow for the consideration of authorial and contextual information in agent decision-making.

5 References

1. Ryan, M.L: Narrative as virtual reality: immersion and interactivity in literature and electronic media. Johns Hopkins University Press (2001)
2. Sheldon, L.: Character Development and Storytelling for Games. Delmar Cengage Learning (2013)
3. Bevensee, S. H., Boisen, K. A. D., Olsen, M. P., Schoenau-Fog, H., Bruni, L. E: Project Aporia–An Exploration of Narrative Understanding of Environmental Storytelling in an Open World Scenario. In: Interactive Storytelling, pp. 96-101, Springer Berlin Heidelberg (2012)
4. Louchart, S. Truesdale, J., Suttie, N., Aylett, R: Emergent Narrative: Past, Present, and Future of an Interactive Storytelling approach. In: Koenitz, H., Ferri, G., Sezen, D., & Sezen, T.I. Interactive Digital Narrative: History, Theory and Practice. Routledge, pp. 185-200, (2015)
5. Weallans, A, Louchart, S, Aylett, R (2012). Distributed Drama Management: Beyond Double Appraisal in Emergent Narrative - Interactive Storytelling, 5th International Conference, ICIDS 2012, November 12--15, 2012. Proceedings, Oyarzun, David, Peinado, Federico, Young, R. Michael, Elizalde, Ane and Méndez, Gonzalo (eds), Springer, 2012