

# Mise-En-Scène of Narrative Action in Interactive Storytelling (Demonstration)

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## ABSTRACT

In this Interactive Storytelling (IS) work, we provide a framework for automating several aspects of staging the activities of a population of narrative agents and their interactions. Narrative agents can have differing levels of narrative relevance within the situated narrative actions which are visualised within a 3D real-time virtual world.

The solution we propose here offers a framework for integrating the use of multiple dynamic regions within the 3D story world defined through a semantic representation that is able to support the staging of narrative actions through the behaviours of the primary and background agents' involved. This includes both the mechanics of dealing with the narrative discourse level as well as the interaction with the narrative generation layer to account for any dynamic modifications of the 3D story world. We refer to this approach as MISE-en-scène Region support (MISER) and are providing here details of the demonstration application which users will be able to interact with.

## Keywords

Virtual Agents; Interactive Storytelling; Virtual Reality; Narrative Staging; Crowd Simulation

## 1. INTRODUCTION

Interactive Storytelling (IS) systems are multimedia-based systems in which users can interact and influence in real-time the unfolding of a narrative as it is presented to them. Our approach of narrative generation is based upon AI planning formalisms which has been extensively presented in previous IS systems [5]. Though the generation of a narrative instantiation is considered as the result of the plan-based mechanism producing the sequence of narrative actions for the considered story, there is still the need to address the way in which the narrative actions are executed within the virtual stage. The plan-based narrative actions are 'executed' through their dramatisation of the behaviours of virtual agents, being the actors of the narrative, through their staging within 3D real-time virtual story worlds. The complexity of the staging of the generated narratives

**Appears in:** *Proceedings of the 16th International Conference on Autonomous Agents and Multiagent Systems (AAMAS 2017)*, S. Das, E. Durfee, K. Larson, M. Winikoff (eds.), May 8–12, 2017, São Paulo, Brazil.

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Figure 1: Example of a MISER configuration setup with virtual background agents evolving in an open-space virtual world.

includes the management of the potential large number of virtual agents populating these virtual worlds and how these agents can be used either as primary or background agents to provide increased realism to the staging of the narrative (see Figure 1). In our approach we are considering the interaction between the *primary* agents, defined by the narrative actions constituting the backbone of the generated narrative, and the *background* agents.

There are a number of challenges to the staging of relevant behaviours for background agents such as:

- the problem of virtual agents' interactions in the background of a visualised scene;
- ensuring that the motion of background agents is both varied and believable;
- ensuring that background agents' behaviours are synchronised with those of the primary agents of the narrative.

Hence, in the work we present here, we were motivated to tackle the problem of automating the staging of background agents in IS systems. A key objective was to remove the need to script behaviours

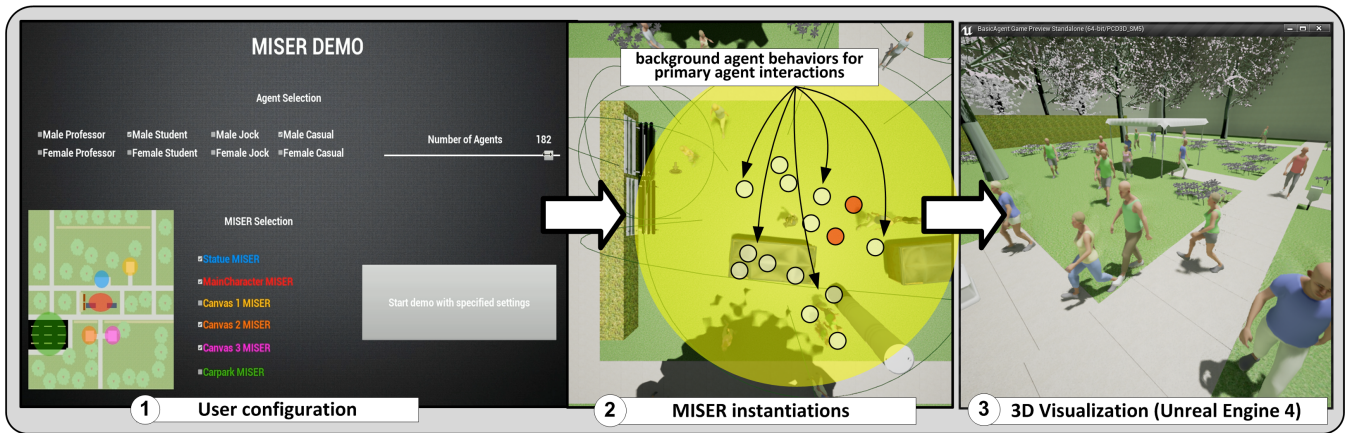


Figure 2: User interaction with the application - In ① the user will be able to configure a set of parameters equating to setup characteristics required for the background agents to be involved in the MISER. In ② the user will be able to visualise the actual instantiation process taking place whilst the spatial regions and the assigned agents' behaviours are instantiated. Finally, in ③ the user will be able to freely navigate around the environment to explore the staging of the background agents in real-time.

of these agents, providing all the benefits of other crowd simulation systems (such as real-time navigation and dynamic choice of actions an agent can perform) whilst creating a believable visualisation of the narratives. Further technical details of our approach as well as examples based on generated narratives can be found in [4].

A video showing the execution of the system and explaining the functionality can be found at:

<https://tinyurl.com/aamas17-demo-miser-video>.

## 2. SYSTEM OVERVIEW

Our approach is fully implemented in a prototype IS system using the Unreal Engine 4 game engine [3], using two popular TV shows as contexts of illustration: one based on *The Big Bang Theory* [1] and the other on *Community* [2].

In the demonstration users will be given the opportunity to explore examples of the dynamic generation of staging background agents based on a set of configuration parameters which includes selecting specific main agents (from narrative actions), number of background agents to be involved in the scene, etc. For further technical details on the approach and its evaluation, you should refer to the accompanying publication to this demonstration [4].

## 3. USER INTERACTION

User interaction with our demonstration system is described separately for the 'user configuration', 'MISER instantiation' and '3D visualisation' steps which are shown in Figure 2.

### 3.1 User Configuration

The graphical user interface shown in Figure 2 ① presents some of the parameters which are exposed from the underlying MISER system in order to specify choices made on the basis of the elements of staging specified as requirements by the user for the subsequent instantiation of the narrative they wish to generate. The parameters include the sets of specific agents' to be incorporated for typical narrative actions within the context of the two narrative environments. They will also propose to select the set of MISER regions which the user wants the staging to focus on, as well as the order of magnitude of the set of background agents to take part in the scene to be staged.

### 3.2 MISER Instantiation

Once the user has selected their requirements in terms of the parameters of the narrative simulation, the MISER regions will be instantiated within the virtual world, as well as the set of main narrative agents and background agents to be involved within the current narrative visualisation (see Figure 2 ②). As per the selected agents' sets in the user configuration, background agents entering a MISER region will perform different behaviours based on their agent type. For example, in our *Community* environment, agents set as student entering a MISER centred around a statue would engage in conversation with other students around the statue. Agents of type lecturer however, would choose to observe the statue and continue with their previous behaviour.

At this point the user is also able to explore the initial configuration's instantiation so as to provide a view of the staging generation process at the initial instantiation step.

### 3.3 3D Visualisation

Finally, Figure 2 ③ shows the 3D real-time interactive visualisation of the complete staging of the virtual agents and their behaviours based upon the initial configuration and preferences defined by the user. Here, the user is able to explore the execution of the staging of the narrative action, in real-time, through keyboard and mouse interaction for free camera navigation.

## 4. ACKNOWLEDGEMENTS

The authors would like to thank Jake Evans for his work on the development of the 3D characters within the Unreal Engine 4 game engine.

## REFERENCES

- [1] The Big Bang Theory. TV series (CBS), 2007-Present.
- [2] Community. TV series (NBC), 2009-2015.
- [3] Epic Games. <https://www.unrealengine.com/>, 2017.
- [4] J. Matthews, F. Charles, J. Porteous, and A. Mendes. MISER: Mise-En-Scène Region Support for Staging Narrative Actions in Interactive Storytelling. In *Proc. of 16th Int. Conf. on Autonomous Agents and MultiAgent Systems (AAMAS)*, 2017 (to appear).
- [5] J. Porteous, M. Cavazza, and F. Charles. Applying Planning to Interactive Storytelling: Narrative Control using State Constraints. *ACM Transactions on Intelligent Systems and Technology (ACM TIST)*, 1(2):1–21, 2010.