

Interactive Story Writing Using ScriptEase

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Abstract

ScriptEase is a tool for writing interactive stories in role-playing games that frees the author from doing explicit computer programming. A story is created by selecting and customizing patterns for the plot, encounters, behaviors and conversations. It has been implemented as a front end to BioWare's *Neverwinter Nights* game. We will describe our experiences using ScriptEase as part of a high school English curriculum.

Introduction

Computer role-playing games (CRPGs) are interactive stories with user participants. Games like BioWare's *Neverwinter Nights* (NWN) have a complete toolset that allows the user to create their own interactive stories within the NWN framework. A large and active community uses these tools to express their stories, making this a new form of creative writing. The top such story has been downloaded over 250,000 times!

Game-story authors are usually not programmers. Story creation should be more like writing than programming. Unfortunately, with most games the story, characters and objects in the story, and the interactions between story elements are specified using computer scripts. Scripts can be written using a popular programming language (e.g. C++), a general-purpose scripting language (e.g., Python), a special-purpose scripting language (e.g., Lua), or a game-specific language (e.g., *Neverwinter Nights*' NWScript). None of these is appropriate for non-computer programmers.

The ability to quickly and reliably generate engaging interactive game stories is essential for at least two reasons. First, game development companies need to create intricate and challenging storylines in a cost-effective way. Second, realism that goes beyond pretty graphics has become a major product differentiator. This includes, for example, having characters with a rich set of behaviors.

This talk discusses ScriptEase, a high-level tool for writing interactive stories that frees the author from doing explicit computer programming (ScriptEase 2005). The user specifies and customizes familiar *patterns*, and ScriptEase automatically turns the specifications into scripting code. Patterns are available for specifying the story plot, encounters, character behaviors and conversations. To validate its ease of use for non-programmers, we discuss its use in the classroom (a Grade 10 English class).

Manual Scripting

CRPGs can contain tens of thousands of game objects, each of which has to understand its role in the game and its interactions with other objects. In most CRPGs, the state-of-the-art is to manually write a script for each game object. Due to the difficulty of such an undertaking—both the number of objects and the complexity of the specifications—programmers, rather than game designers, usually write these scripts. There are several problems with this approach:

1. It often results in inconsistencies between the designer's intent and the programmer's implementation.
2. It consumes (expensive) programmer time.
3. Amateur designers want to build game adventures and they usually do not have easy access to programmers.

In a perfect world, game designers should be able to write scripts themselves.

Using BioWare's Aurora toolset, a user programs a game as follows. An object is selected and a script is entered using a C-like programming language called NWScript. Essentially, an event handler can be scripted for any of the events that the object can respond to. However, since most amateur and student writers are not programmers, they find scripting very difficult. Amateur writers often try to copy-and-paste scripts from existing stories without understanding the code.

AI game scripts can be hundreds of thousands of lines (e.g., the NWN standard campaign story has 141,267 script lines in 7,857 script files). A tool that facilitates development of this critical game component should:

1. be usable by non-programmers,
2. support a rich set of non-repetitive behaviors,
3. support rapid prototyping, and
4. eliminate most common types of errors.

ScriptEase

ScriptEase is a publicly-available tool for specifying interactive stories using a high-level menu-driven “programming” model (ScriptEase 2005). ScriptEase solves the non-programmer issue by having the designer select specifications at the level of “patterns” (McNaughton *et al.* 2004). By abstracting the components of a game story into hundreds of commonly occurring patterns, the user can express their creativity at a familiar level of reasoning. For example, opening a chest and having something magical happen is so common in CRPGs that one should not have to write code to make it happen; choosing the right pattern should suffice. From the user-specified patterns, ScriptEase automatically generates scripting code for the game engine being used (Neverwinter Nights in our case). It has a rich set of patterns, supports rapid prototyping (the patterns cover most of a user’s needs), and eliminates many types of errors (patterns are debugged by the pattern designer).

Experience

We have two data points suggesting that ScriptEase can be used by non-programmers to reduce the costs of scripting a computer game. First, we have rewritten substantial portions of the original Neverwinter Nights scripts using ScriptEase. This resulted in a large reduction of the number of lines of scripting code needed, and uncovered several errors in NWN (the result of sloppy cut-and-paste tactics) (McNaughton *et al.* 2004).

Second, in October/November 2004, ScriptEase was used as a graded assignment in the creative writing component of a Grade 10 English curriculum. The students enthusiastically embraced the assignment. This talk will report on our experiences using ScriptEase in the classroom.

Conclusion

Our initial experiences with ScriptEase have been positive. Our pilot high school story writing exercise was successful. We learned that high school students CAN create interactive stories using ScriptEase, and the teacher noted a distinct positive change in attitude and behavior during the interactive story writing exercise. Additional classroom experiences will be discussed in the presentation.

The development of interactive story writing technology is still in its early stages. Our work is intended to make this technology available to non-programmers, dramatically reduce the costs of scripting a non-trivial story, demonstrate its pedagogical value in the classroom, and work towards popularizing this medium as a new form of creative literature.

Acknowledgements

The research was supported by grants from the Natural Sciences and Engineering Research Council of Canada (NSERC) and Alberta’s Informatics Circle of Research Excellence (iCORE).

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