

# Creating Interactive Narrative Structures: The Potential for AI Approaches

**R. Michael Young**

Liquid Narrative Group  
Department of Computer Science  
North Carolina State University  
Raleigh, NC, 27695  
young@csc.ncsu.edu

## Abstract

This paper poses a number of questions that center on the relationship between narrative in an interactive environment and the representations and reasoning processes that AI researchers might bring to bear to create and maintain such narrative experiences.

## Narrative Structure and the Representations of Actions and Plans

Narrative theorists (Rimmon-Keenan, 1998, Bal 1999) characterize the building blocks of plot in terms of agents (called actants), events and the causal and temporal relationships between them. For narratologists, these notions are primarily used as *analytical* tools, however their formal nature suggests that they might be useful as the foundation for the construction of computer programs that *create* stories.

- What structures from AI research can most readily accommodate representations of narrative? Are current formal models for reasoning about actions appropriate? If so, what are the most obvious initial approaches? If not, how might existing models be extended to account for the aspects of narrative most central to interactive entertainment?
- Are planning systems effective computational models for narrative? If so, what features of these models/systems correspond to the well-articulated structures of narrative? How might narrative theory inform new research in planning to yield computational engines for creating aspects of narrative structure?

## Cognitive Models

Psychologists (Bruner, Graesser et al, 1981, Trabasso and Sperry, 1985, van den Broek, 1988) Film Theorists (Branigan, 1992) and Narratologists (Emmott, 1997) have strongly argued for various models of the cognitive processing that occurs during the comprehension of stories.

- How might current approaches to user modeling be extended to characterize the mental state of participants in story-oriented interactive systems?
- As one example, consider a viewer's experience of suspense. The phenomenon of suspense has been related by Gerrig and others (Carrol, 1996, Gerrig 1996, Ohler and Nieding, 1996) to a viewer's anticipation of the success or failure of the plans and goals of a protagonist. Can mental models of action-related reasoning from AI be used to characterize a user's level of suspense? If so, can systems that create stories on-the-fly make use of such models to shape an unfolding story so that the experience of suspense is appropriately manipulated?

## Character and Plot

Considerable work is currently being performed on the creation of animated, believable characters. But character as an aspect of narrative is deeply intertwined with plot. Character directly influences an agent's choice for action, which in turn contributes directly to an unfolding plot. Plot creates circumstances in which an agent must demonstrate its character by selecting between divergent options. The symbiotic relationship between plot and character suggests that any attempt to create interactive entertainment by focusing on just one of these factors in isolation will fail to capture the whole story.

- How can current models of character be integrated into computational models of plot?
- How can models of plot be developed that provide the representation needed for effective characterization?

### Balancing Story and Interaction

There is a basic tension between the creation of narratively coherent experiences and the creation of truly interactive ones. Coherence comes from the careful selection and presentation of actions whose causal and temporal relationships highlight an underlying plot. Interaction, where the user is able to substantively alter the state of the world at any given point in a story, can so radically alter the world that even the most accommodating plot lines cannot survive.

- Is it necessary to abandon control for coherence, or coherence for control? Or is it possible to take a middle ground in which the system works extremely hard to create the illusion of user control while actually constraining a user's activities "behind the scenes?"
- If a middle ground would be effective, how might computational models of action, including both deliberative and reactive approaches, be adapted to achieve this balance?
- What representations are necessary to identify narrative "exceptions" or other run-time conditions that would require a system to intervene or otherwise adapt to a user's unanticipated actions in an unfolding story (Young, 1999)?
- Entertainment media companies like Disney have embraced the notion of illusion for decades (Thomas and Johnston, 1981); is an increased emphasis on the creation of illusion and a decreased emphasis on the re-creation of reality essential to progress in interactive entertainment? Would a shift away from "realistic" models of action in storyworlds make their creation more straightforward?

### References

Bal. M., 1997. *Narratology: Introduction to the Theory of Narrative*, University of Toronto Press.

Branigan, E. 1992. *Narrative Comprehension and Film*, New York, Routledge.

Bruner, J.. 1986. *Actual Minds, Possible Worlds*, Harvard University Press, Cambridge, MA.

Carroll, N., 1996. The Paradox of Suspense, in Vorderer, et al, eds,*Suspense: Conceptualizations, theoretical analyses and empirical explorations*. Lawrence Erlbaum.

Emmott, Catherine, 1997. *Narrative Comprehension: A Discourse Perspective*, Clarendon Press.

Gerrig, R. J., 1996. The Resiliency of Suspense, in Vorderer, et al, eds,*Suspense: Conceptualizations, theoretical analyses and empirical explorations*. Lawrence Erlbaum.

Graesser, A.C. and Roberston, S.P. and Anderson, P.A. 1981. Incorporating inferences in narrative representations: a study of how and why, *Cognitive Psychology*, vol 13, pp 1-26.

Ohler, P. and Nieding, G. 1996. Cognitive Modeling of Suspense-Inducing Structures in Narrative Films, in Vorderer, et al, eds,*Suspense: Conceptualizations, theoretical analyses and empirical explorations*. Lawrence Erlbaum.

Rimmon-Keenan, S. 1998. *Narrative Fiction: Contemporary Poetics*, Routledge.

Thomas, F. and Johnston, O. 1981. *The Illusion of Life: Disney Animation*. New York: Hyperion.

Trabasso, T. and Sperry, L., 1985. Causal relatedness and importance of story events, *Journal of Memory and Language*, vol 24, pp. 595-611.

van den Broeck, Paul. 1988. The effects of causal relations and hierarchical position on the importance of story statements, *Journal of Memory and Language*. vol 27, pp 1-22.

Young, R. Michael, 1999. Notes on the Use of Plan Structures in the Creation of Interactive Plot in *The Working Notes of the AAAI Fall Symposium on Narrative Intelligence*, Cape Cod, MA, November.