Back-Leading through Character Status in Interactive Storytelling

Jichen Zhu[1], Kenneth Ingraham[2], and J. Michael Moshell[3]

[1] Antoinette Westphal College of Media Arts & Design
Drexel University, Philadelphia, PA 19104
jichen.zhu@drexel.edu
[2] Interactor Simulation Systems, LLC, Orlando, FL
kenneth.ingraham@gmail.com
[3] School of Visual Arts and Design
University of Central Florida, Orlando, FL 32816
jm.moshell@cs.ucf.edu

Abstract. A key challenge in computer-based interactive narrative is the conflict between user agency and authorial control of the story quality. Valuable lessons can be learned from improvisational and especially interactive theatre, where various narrative and interactive strategies have been developed to engage users in the process of co-creating the story. In this paper, we focus on the use of character status and status shifts. Specifically, we present and illustrate a computational model of status shifts based on the cognitive semantics theory of force dynamics.

1 Introduction

Interactive narrative is a contemporary form of the age-old human creative activity of storytelling. Unlike the king in *One thousand and One Nights* who was satisfied by listening to Scheherazade's carefully crafted tales every night, modern users are eager to play a more active role in the stories. Interactive narrative offers them the opportunity to participate and influence the narrative world in a wide variety of ways. A central challenge to interactive narrative is what is known as the "narrative paradox" — the conflict between user agency and authorial control to structure the narrative for better user experience [4, 2, 9]. Generally speaking, the more freedom the user obtains to influence the story world, the harder it is to maintain the quality of the story. As Marie-Laure Ryan [13] rightfully asks, will there ever be any user, while playing the title character in a game version of Anna Karenina, who decides to kill herself in order to make the story more interesting? To many interactive narrative and game studies researchers, the answer is no [1]. As a result, effort has been put to make interactive narrative systems more algorithmically sophisticated to resolve this conflict. An example is to incorporate drama managers [11].

However, algorithmic advancements in story generation and drama management alone are not the complete answer to Ryan's question. At the end, a truly interactive narrative piece relies on the user to make major decisions for her character, and those choices will significantly impact the quality of the story.

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If it takes professional storytellers years of experience to master their art, why should we expect an untrained user to play such an active part of a great story without giving her the necessary clues and guidances?

The act of guiding and engaging the user without taking away their freedom of input and, ultimately, spurring their creativity in leading the story is as creative as constructing story content itself. Here, we look closely at parallel settings in theatrical interactive performance, including improvisation theatre (improv) and particularly interactive theatre. Although both forms have spontaneous nature and are built upon one another, improv is primarily performed by trained actors for the audience to *observe* whereas the interactive theatre (e.g., "Tony and Tina's Wedding," Disney's "Turtle Talk") is structued around untrained audience members' *participation*[17, 7]. Interactive theatre's primary concern of engaging untrained participants provides valuable insights to the narrative paradox in computer-based interactive narrative in ways that are unique and complementary to lessons learned from the improv theatre.

In interactive theatre, trained actors (*inter-actors*) engage audience participants (*spect-actors*) through a set of techniques called *back-leading* [17, 7], a metaphor from ballroom dancing. Although traditionally classified as the follower in the couple, many women developed the skill of leading the dance while appearing to be following their less skillful male partners. Similarly, a good inter-actor provides the right amount of necessary guidance to the spect-actors while still leaving sufficient creative space for the latter's creative input. This paper presents our initial work of understanding and ultimately modeling back-leading, focusing on the use of character status and status shifts and a computational model of it based on the cognitive semantics theory of force dynamics. For the rest of the paper, we first present related work and introduce the theoretical frameworks of status and force dynamics. Next, we demonstrate how force dynamics provides a useful cognitive model to understand character status and status shifts. Finally, we provide discussions and conclusions.

2 Related Work

Improvisation has recently received renewed interest for insights into interactive storytelling. A number of virtual theatre projects used insights from human improv theatre as the basis of their systems. For example, Perlin and Goldberg's *Improv* system creates animated characters who interact with users through real-time behavior-based animation [12]. Hayes-Roth's Virtual Theater Group [6] and the more recent work by Ballin et. al. [3] explicitly model character status as the constraints of character behavior along the lines of demeanor, relationship, and space. Swartjes and Theune[15] also implemented an IDS system using the late commitment concept. Recently, Fuller and Magerko's [10, 5] empirical study of improv performers identified the "cognitive convergence" and "cognitive divergence" processes that allow different performers to co-create a scene based on shared cognitive models. Compared to the above work, our focus is not how professional improv actors work with one another. Instead, we are primarily

concerned how inter-actors engage untrained spect-actors and overcome the disparities of their storytelling and improvisation skills in the process of creating stories on the fly. Our work does not focus on the level of animating characters' body language as in some of the related work, but rather on the *plot-level* relationships between characters and/or the environment. Our current method is introspective, based on the experience of one of the co-authors as inter-actor and director of interactive performance projects in the past seven years.

3 Theoretical Framework

Status, first introduced by Johnstone's classic text [8], is one of the core concepts in improv and interactive theatre [14]. It describes the social and professional standing of a character and her relation to other characters as well as the environment (e.g., space and props). Generally speaking, a high-status character dominates the situation whereas a low-status one submits. Status can be seen as a top-down "motivation" to a character's actions in that "every inflection and movement [of a character] implies a status" [8] and hence determines her range of possible gestures and speech. Depending on the level of complexity, character status can be either binary (i.e., high vs. low status) or multiple degrees (e.g., status 2 out of 10). Johnstone and his followers believe that a large proportion of drama comes from how characters attempt to raise or lower their social status through different means. When the status of the characters changes in a play, he claims, it is typically the most enjoyable part for the audience to watch. A standard two-character scene can include four types of *status shifts*: 1) both lower status, 2) both raise status, 3) one raises while the other lowers, or 4) the status is reversed during the scene.

In interactive theatre, status is a simple but powerful tool to communicate to spect-actors. An intera-actor's first task is to engage the spect-actor quickly and once the latter becomes comfortable enough to make choices on her own, the inter-actor can provide more guidance on how to react to the world she is experiencing. *This is where status can be useful.* Based on our experience, an inter-actor's choice of adopting high or low status can provide useful cues for the spect-actor to respond accordingly. Once a spect-actor has established a baseline status for herself within a story, she can begin to form a hierarchy of status among other characters. Inter-actors then can use this hierarchy to position themselves within that framework and co-create the story from this foundation.

A useful framework to understand the working of status in narratives is the cognitive semantic theory of force dynamics (FD). Developed by Leonard Talmy [16], the framework captures fundamental semantic structures such as "the exertion of force, resistance to such a force, the overcoming of such a resistance, blockage of the expression of force, removal of such blockage, and the like," some of which are hard to represent under the traditional notions of causality. A basic force dynamics pattern contains two entities, an *Agonist* (the focal entity) and an *Antagonist*, exerting force on each other. An Agonist has a *tendency* towards either motion (action) or rest (inaction), and it manifests

Table 1. Comparison of Status and Force Dynamics

Status in performance	*Force Dynamics*
Main character	Agonist
Secondary character	Antagonist
Attempts to change status	Tendency to motion
Attempts to maintain status	Tendency to rest
Successful attempts	Stronger
Failed attempts	Weaker

its tendency if it is stronger than its Antagonist. To represent "The ball kept rolling because of the wind blowing on it," for example, the Agonist *ball*'s intrinsic tendency towards rest is overcome by the Antagonist *wind*'s greater force, and hence the result is the motion of the Agonist. FD can be used to describe not only physical forces, but also psychological and social interactions. Conceiving such interactions as psychological "pressure," FD patterns can manifest themselves in various semantic configurations, such as the "divided self" (e.g., "He held himself from responding") and complex social interactions (e.g., "She gets to go to the park.") In the FD framework, time is represented by sequences of *phases*. A phase describes the segment of time during which the Agonist and Antagonist have a relatively stable FD relation.

4 A Model of Status in Interactive Performance

At the fundamental level, both FD and status describe the power relationship between two or more entities and its changes throughout time. In a scene of two characters, we may select the one of primary interest to us as Agonist and the other as Antagonist. The Agonist's attempt to change her status is defined as her tendency to motion, whereas her attempt to maintain her current status is defined as her tendency to rest. The character who manages to achieve her intended status is the stronger one in the FD relation. The changing FD relations across different phases therefore offers a semantic model for status shifts. Table 1 lists the matching elements between status and FD in our current model.

Using the above FD-based model, we can analyze the dramatic structure of interactive theatre in terms of status shifts. Take the example of an interactive scene in which a spect-actor plays the role of a young musician. The first time the musician encounters the parent character, played by an inter-actor, the latter exhibits a controlling and dominating manner regarding various aspects of the musician's life. In the subsequent scene, other inter-actors' characters set up external and internal influences over the musician, possibly leading to her decision of leaving home and pursuing her dreams. In a final confrontation with the parent, the empowered musician may overcome the pressure of the parent and depart. In this hypothetical case, the inter-actors back-lead the spect-actor to co-create a dramatically interesting story.

Our FD-based model can help us further analyze the above scenario. The interaction can be divided into 2 phases, corresponding to the musician character's status shifts. In Phase 1, the Agonist (spect-actor's musician character) has the tendency to move but is hindered by a stronger Antagonist (her parent). Phase 2 is composed of the subsequent two scenes, in which the strengthened Agonist is able to overcome the Antagonist and initiate the motion. In our experience, status shifts (i.e., FD relation changes) are closely associated with the adrenaline rush and emotional satisfaction that spect-actors often report to experience. In this case, we would argue that the experience of coming up against the parent character and overcoming his control in a visceral way is essential to both the story development and the experience of the spect-actor. As in computer-based interactive narrative, the key question here is how to provide the right condition so that the spect-actor will (appear to) initiate the status shift herself — the principle of back-leading. In the case of the above scene, it is important to clearly establish the initial status of the spect-actor's character in Phase 1 and her power relation with the Antagonist. Phase 2 needs to introduce the motivations and events that could lead to the Agonist's increased strength. The forward momentum of the narrative is designed to lead to a resolution, in which the intentions of the two characters will conflict and may result in a shift in their FD relations in the end.

5 Conclusion and Future Work

In this paper, we discussed the importance and challenges of engaging the lay user in the creative process of interactive storytelling. Useful lessons can be learned from human improv theatre and especially interactive theatre in terms of how inter-actors guide, engage, and spur the creativity of untrained spect-actors on stage through back-leading. In this paper, we pay especial attention to the use of character status and status shifts. Using the cognitive semantic theory of force dynamics, we proposed a semantic model, which can be used to formally model status and status shifts in interactive theatre sessions.

As part of our future work, we plan to conduct empirical studies of interactive theatre and gather further evidence to complement our current introspective method. Our long-term goal is to test our FD-based model in computer-based interactive narrative systems in regard to the narrative paradox. Modeling character status and status shifts also opens up new possibilities of automatically assessing story interestingness. It is of special importance to computer generated interactive narrative research because it will afford the system more autonomy in story generation or drama management.

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