

# Player-Protagonist Motivation in First-Person Interactive Drama

*A Framework for Aristotelian Interactive Drama*

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**Abstract.** Unlike traditional drama, in first-person interactive drama (ID) the motivations and actions of the most important character—the player-protagonist—are outside the writer’s control. We present a new approach to ID that simultaneously addresses the player-protagonist motivation problem and avoids an “explosion of endings” from unpredictable player actions. Our approach offers the player multiple storylines, each capable of developing into a complete dramatic arc. Opportunities to enter each storyline represent hypotheses about players’ motivations. Player actions resolve these hypotheses, either confirming their motivation and advancing the story in the player’s mind, or revealing disinterest (followed by alternate story opportunities). Each story is freed from the intractable burden of resolving all possible actions, allowing writers to focus on the proverbial 20% of the possibilities that provide 80% of the experience. Within a rich virtual simulation, this system provides a complete framework for interactive drama with classic Aristotelian structure.

## Introduction

The structures of stories and storytelling, in their various forms over the millennia, have been analyzed extensively: Greek drama (Aristotle 330 BC), Russian folk tales (Propp 1968), the bardic tradition of oral story composition (Lord 1960), the novel (Forster 1927), cinema (McKee 1997), and many others too numerous to cite. For authors seeking to create compelling drama, close attention to story structure—the progressive complications and turning points in a sequence of scenes and acts—is as important today as it was 2300 years ago.

## Interactive Drama

More recently, interactive storytelling and narrative in many forms have received widespread attention and analysis (Murray 1998; Mateas and Sengers 1999; Ryan 2001). These reviews touch on a wide range of formats, including hypertext fiction, interactive fiction, video games, MUDs and MOOs, role-playing games, and interactive drama. While these formats each illuminate aspects of the dance between interactivity and story, in this paper we focus on interactive drama.

For our purposes, interactive drama has several key traits. It is first-person, in that the player is also the protagonist: this player-protagonist creates, identifies with, and controls

their in-story persona, and that persona is the central character in the story.<sup>1</sup> The player-protagonist has wide-ranging freedom of action. Finally, the player-protagonist experiences one or more well-structured Aristotelian dramatic arcs. This definition of interactive drama presents significant theoretical and practical questions for automated storytelling systems. How can such systems assure that the story and its dramatic structure are engaging and compelling for each player? How can they generate a story experience that incorporates the unknowable motivations and actions of each individual protagonist, without succumbing to an intractable expansion of the story's scope—an “explosion of endings”? This is the player-protagonist motivation problem: how do we simultaneously address the needs of both the player and the protagonist?

Three major approaches characterize previous attempts to create automated interactive drama. *Director-centric* approaches (e.g. Laurel 1986, Weyhrauch 1997, Mateas and Stern 2002), with a director agent or drama manager monitoring and influencing the progression of the story, offer at least the potential to produce well-structured dramatic experiences on a consistent basis. Even so, these attempts often overlook the player-protagonist motivation problem, and, in addressing the “explosion of endings” dilemma, restrict the players' freedom of action, assign inappropriate consequences to their actions, or even sacrifice the dramatic arc altogether. *Simulation-based* approaches (e.g. Crawford 2000) allow users to initiate and influence a chain of events in a narrative simulation with locally defined narrative causality, while *character-centric* approaches (e.g. Bates 1992, Bates 1994, Reilly 1996, Maes 1996, Stern 1999) rely on the interactions of goal-based character agents to produce a story. Both of these approaches may occasionally produce a well-structured dramatic arc, but they lack explicit awareness and control of the overall story structure; therefore, they generally leave the production of a well-formed dramatic arc to chance.

## The Player

Although some players may create dramatic structure in retelling or ruminating on their interactive experience, that is a different effect from experiencing drama in real-time:

Aristotle approached the question of story and meaning in this way: Why is it, he asked, when we see a dead body in the street we have one reaction, but when we read of death in Homer, or see it in the theatre, we have another? Because in life idea and emotion come separately. [...] In short, a story well told gives you the very thing you cannot get from life: meaningful emotional experience. In life, experiences become meaningful *with reflection in time*. In art, they are meaningful *now, at the instant they happen*. (McKee 1997; his emphasis)

This is a concise statement of our goal in interactive drama: to produce meaningful experiences, based on the player's actions, in real time.

As described by Murray (1998), players experience *agency* when they have freedom of action, and those actions have meaningful and appropriate consequences in an interactive environment. Yet many approaches to ID inherently restrict agency. Some researchers

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<sup>1</sup> In our definition, first-person does not refer to the camera perspective.

have assumed that player-protagonist actions must be constrained in order to create well-formed Aristotelian drama (Mateas, 2000; Young, 2000; Ryan 2001). The Oz group explicitly suggests intervention to make the player experience conform to the author's intended dramatic destiny (Kelso et al. 1993; Weyhrauch 1997; Mateas 2000). However, imposed constraints on player action are inconsistent with full agency. Such constraints either force players to adopt actions and motivations that they didn't choose or cause outcomes that would be inappropriate results of the player's actions. We believe that restricting players' dramatic choices is unnecessary, and that doing so severely damages their experience of agency and immersion.

Ryan (1997) has suggested that obtaining the cooperation of the player-protagonist provides one route to achieving a compelling story experience. Ryan proposes child's play, which is simultaneously repetitive and improvisational, as a model for interactive drama. In her example, the participants know the structure of the story and introduce minor variations of their own while following its basic outline. Certainly, restricting the audience to players who have prior knowledge of the basic plot and who want to follow the story line would make the author's task quite a bit simpler. We believe, however, that neither of these conditions is necessary. In an ideal ID system, cooperation should be effortless: players follow their own intrinsic motivations at all times, and still end up experiencing a well-formed story.

Traditionally, the author defines characters and their motivations, and creates a sequence of events in which those characters act and evolve. In experiencing and interpreting the story, readers supply their own life experiences and internalized knowledge (Ingarden 1973 and Iser 1980, as described by Ryan, 2001). With individual readers filling gaps and resolving indeterminacy in the story based on their own imaginations, their experiences can be highly personal (Ryan 2001). In essence, the story is not the words on the page; it is the response in the mind of the reader. Indeed, it is the *reader* who makes the story meaningful.

In interactive drama the story depends even more on the "reader" or player. In addition to interpreting events, players directly control the central character. Each player's own motivations drive their potentially unpredictable actions. Since the story resides in the mind of the player, the story must be defined as the progression of *the player* through the stages of a dramatic arc. Therefore, we see a holy grail of interactive drama that allows players the freedom to act as they please, while still offering a well-formed dramatic arc based on those actions—in effect, players simultaneously choose actions that are based on their intrinsic motivations and experience meaningful results in the story.

### **The Protagonist**

Fundamental to the notion of a protagonist is his or her motivation. The dramatic protagonist must have a desire, be capable of willful action to pursue that desire, and create meaningful and irreversible change in the course of the story. According to McKee (1997, p. 138), "[a] story cannot be told about a protagonist who doesn't want anything, who cannot make decisions, whose actions effect no change at any level." In drama, characters' actions and other story events trigger value transitions, which are changes in the mental state of the protagonist and other characters that are meaningful in the story. These transitions, from minor turning points to major reversals, move the story through

its dramatic arc. In interactive drama, story events have the same responsibility: to produce the value transitions that move the player-protagonist through a complete dramatic arc. Without these transitions to move it along, the story itself stagnates, and perhaps doesn't even exist for the player. In other words, the player *as protagonist* must experience the value transitions that define the story.

The assumption that the interests of the author (plus the storytelling system) compete against the interests of the player is widespread in the analysis of interactive drama. For example:

The basic paradox of interactive art [is] reminiscent of a familiar theological problem: How can the interactor freely choose her actions if her destiny is itself controlled by the godlike authority of a world designer? [...] [A]s an individual trying to live his life according to personal values, beliefs, and ambitions, the interactor will not be motivated by the same goals as the system. (Ryan 2001, p. 320)

We contest this assumption: such opposition is both unnecessary and intrinsically harmful to efforts to produce compelling interactive drama.

In actuality, an interactive story system cannot *force* the player to do *anything*; it can only offer or restrict opportunities. Therein lies the seed of a solution to the player-protagonist motivation problem. The player wants to experience a meaningful drama, built around her own self-motivated actions. In order to achieve their own goals, authors must discard the notion that it is desirable or even possible to impose a dramatic destiny on the player. Instead, the author adopts the player's goal, crafting a story around the needs of the player-protagonist. This shift in perspective enables a unity of purpose between the player on the one hand, and the author and story system on the other. The challenge is to match the player with a story in which her motivations are aligned with those of the protagonist envisioned by the author.

### **The Player-Protagonist**

For compelling first-person interactive drama, we must meet the needs of both the player and the protagonist: interactive engagement for the player must coexist with the narrative coherence required by the protagonist. To produce emotional engagement, we must address the player's personal motivations. To create a meaningful *story* experience, we must recognize the primacy of the protagonist's intrinsic motivations throughout the story.

Fundamentally, *interactive drama is about the player-protagonist*: her desires and motivations, the willful actions she takes, and the change she causes and experiences during the story.

### **Our Approach**

We present a framework for interactive drama designed to address the player-protagonist motivation problem. Players have full agency, without coercion or limitation, and yet experience well-formed Aristotelian story arcs. Despite players' freedom and

unpredictability, writers need not anticipate every possible player action, nor write every possible ending. The key components of the framework include:

*Personal Narrative Agent (PNA)*, which manages the overall story experience and the progression of each story for the player.

*Narrative Forms (NF)*, which define the dramatic structure and possible progressions of each story and allow for substantial variability and replayability.

*Multiple stories for players*, so that players have a rich experience built around their intrinsic motivations, while each story need not encompass all possible actions.

*Evolving Narrative Hypotheses*, whereby the system determines players' interests and motivations, and offers stories that engage each player.

*Story Transitions and Story Weaving*, enabling a seamless overall experience in the story environment.

### **Axioms and Assumptions**

Our approach to the challenges inherent in achieving interactive drama is based on a series of assumptions:

- The story is an experience in the mind of the player, rather than a sequence of images or words (after Iser, 1980).
- The structure of drama is integral to its real-time experience. Truly compelling and engaging stories are unlikely to occur by happenstance, e.g. via unguided simulation or unstructured interactions among people and characters. Retelling an experience as a story is not the same thing as experiencing the drama contemporaneously with the events.
- Players will be more engaged in stories that resonate with their own motivations.

### **Personal Narrative Agent**

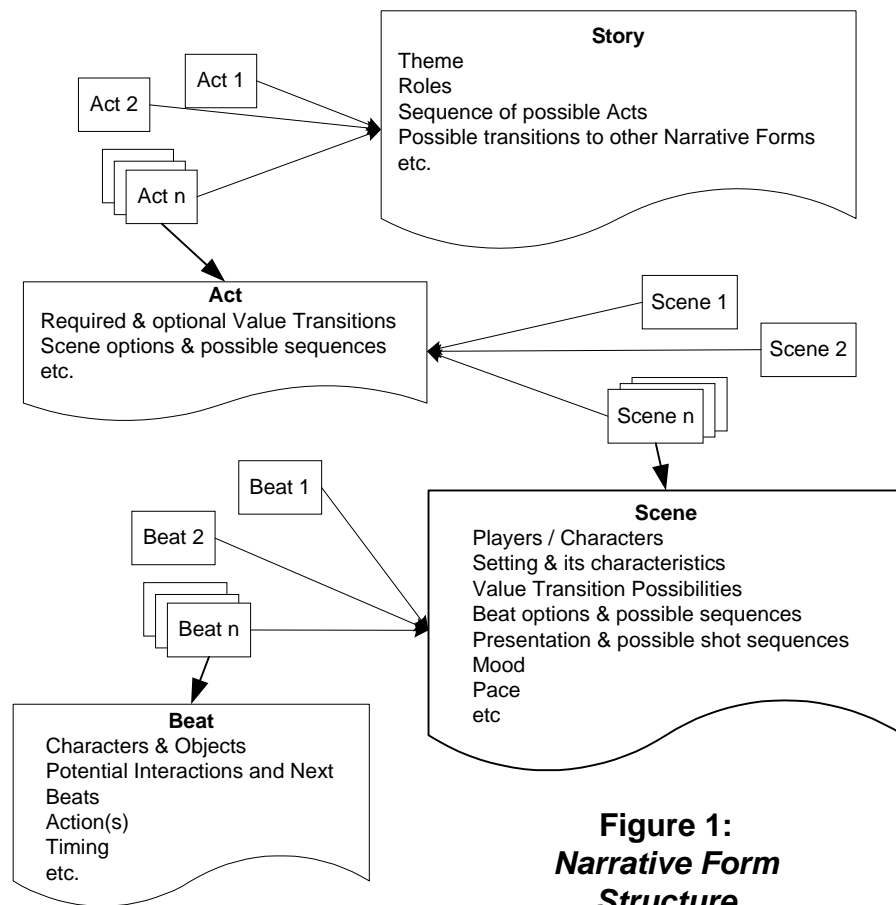
The Personal Narrative Agent (PNA) is responsible for creating and managing the player's story experience. As the player explores the world, the PNA works behind the scenes, interacting with characters and objects to trigger events in the player's unfolding story. As players respond to these events, the PNA interprets their responses and plans the ongoing progression of stories.

The PNA operates in concert with a simulated environment. The simulation offers the player an immersive world, containing rich background activity and a variety of opportunities for interaction. By directing characters and objects in the world to support dramatic goals, the PNA supports the player's selection of and progression through multiple stories. While complete details of the PNA's design are beyond the scope of this paper, some key approaches are described below.

### **Narrative Form**

The *Narrative Form (NF)* defines the essential elements of a particular type of story, enabling robust interpretation of classical story archetypes in a wide range of contexts.

The NF specifies the elements of the interactive story, including its structure, themes, characters, and settings (see Figure 1). The PNA creates particular stories by combining elements of the player's current situation with a NF, directing objects and characters to act according to the story using the rules defined in the NF. The PNA and Narrative Forms combine to create variability (and therefore replayability) by casting different characters, objects, and settings in prototypical roles encoded in the NF. Each Narrative Form is thus capable of generating a wide variety of distinct story experiences.



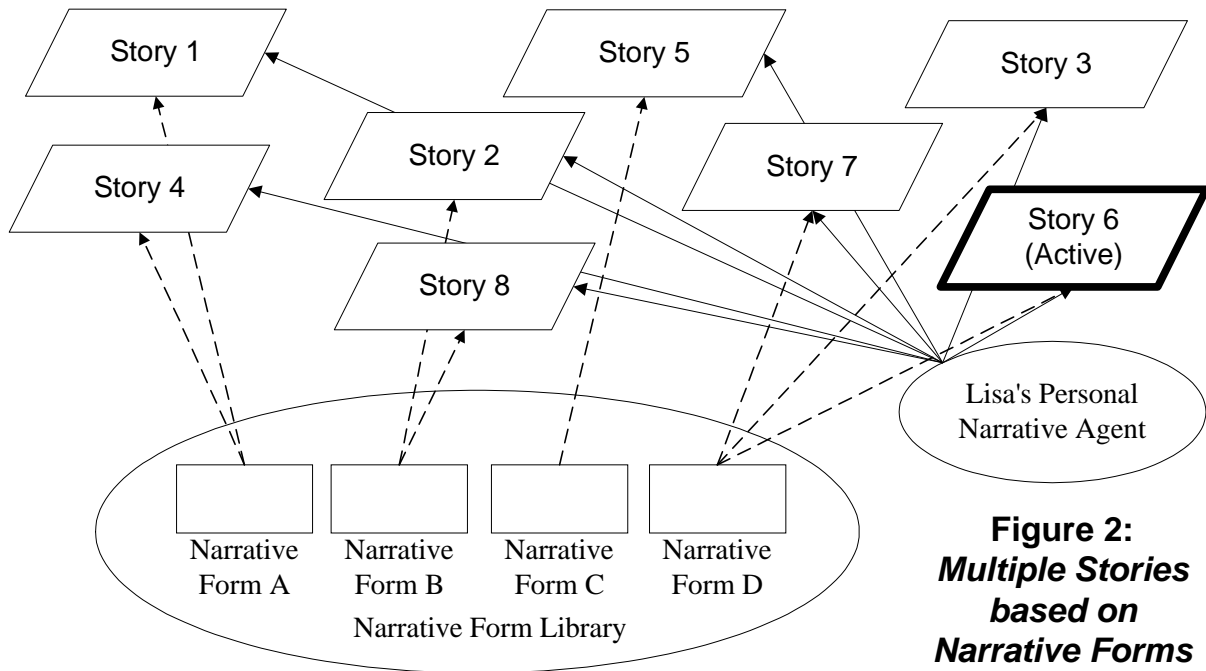
**Figure 1:**  
**Narrative Form**  
**Structure**

At the top level, the story defines the main elements required for narrative progression through a dramatic arc: theme, roles, and a sequence of possible acts. Each act defines a sequence of possible scenes and the conditions for completion of the act. Scenes begin with a hypothesis about a value transition or transitions that the protagonist might choose, and end shortly after such a transition is completed. Each scene defines attributes (e.g. the characters, setting, pacing) and a potential sequence of beats. Each beat represents a moment that turns or changes—an interaction or event that propels the scene forward. This structure is inspired by current entertainment industry practice (McKee 1997).

### Multiple Stories

Each player has *many stories and story opportunities* from which to choose, and at any given time may have multiple stories active in the virtual world (see Figure 2). This

approach is modeled after the experiences of everyday life, in which people act in many realms, both separate and overlapping. Retelling the events of even a single day will generate many distinct stories—from self-contained events such as a play session where your daughter learned a key lesson, to interactions with a spouse or colleagues who may be part of a long-term, ongoing drama.



**Figure 2:**  
***Multiple Stories  
based on  
Narrative Forms***

Following that model, we explicitly discard the notion that an interactive story must encompass all of a player's possible interactions. Instead, players may engage in a wide variety of stories, each a separate narrative thread. A complete storyworld provides a rich set of different stories; these individual stories (and the Narrative Forms from which they are created) can be simpler, while the player experience becomes richer.

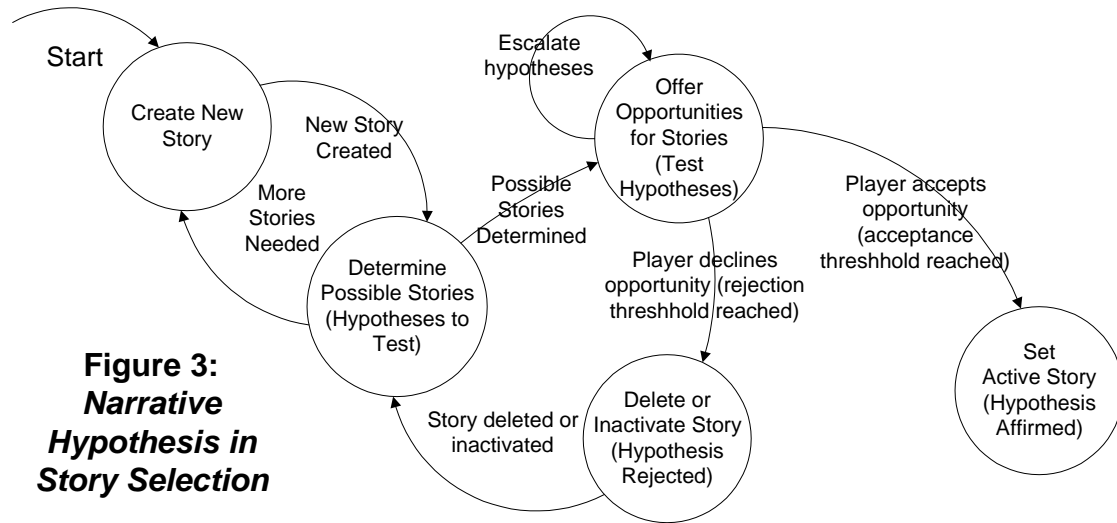
The PNA observes the player in the simulation and presents opportunities to begin stories based on the player's unconstrained interactions. These opportunities appear to the player in the form of naturally occurring events in the simulation, seamlessly presented so that the player may choose to interact with—or ignore—each opportunity as it is presented. Thus, the PNA enables every action taken by the player to be potentially relevant, without requiring writers to exhaust all the possible interactions for any given story. Instead, the simulation provides a background, freeing the author and the PNA to focus on the story's most salient interactions. This allows our framework to offer nearly complete Agency without the "explosion of endings" problem.

### **Evolving Narrative Hypotheses**

Each narrative form advances through its narrative arc by presenting and resolving a series of hypotheses. Each opportunity to enter or advance a storyline is a narrative hypothesis. The players' actions in response to the opportunity either affirm or deny their interest in and commitment to a particular story and its progression. Players' choices act

as a self-selection mechanism ensuring that players experience stories of interest given their individual motivations and goals.

The Personal Narrative Agent manages the presentation and interpretation of hypotheses (see Figure 3). Narrative hypotheses are resolved in the context of a scene, which requires a value transition in order to move toward completion. The PNA follows instructions contained in the Narrative Form (at the level of the scene) to generate a sequence of beats that offers the player a specific opportunity, and interpret the player's response to that opportunity.



**Figure 3:  
Narrative  
Hypothesis in  
Story Selection**

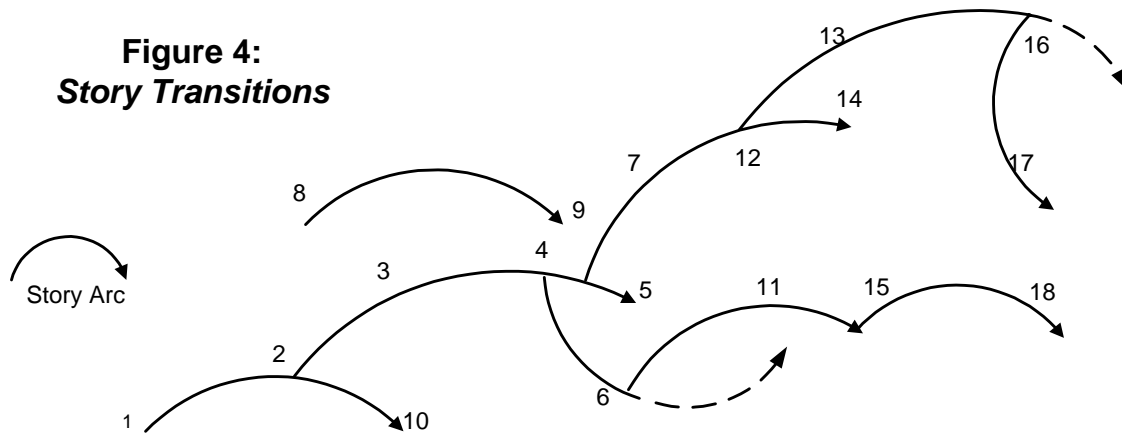
Even with exceptionally good response recognition, there remains significant potential for misinterpreting the player's actions. Players may fail to notice a story opportunity, or fail to understand how to act on it. Alternately, the narrative system may incorrectly interpret the player's actions. To counter both challenges, the PNA confirms the player's intent by presenting multiple escalating hypotheses to the player. This escalation reiterates the consequences of the player's chosen action, verifies his commitment to those consequences, and advances the story accordingly.

### Transitions and Story Weaving

Multiple story arcs and seamless transitions from arc to arc create a rich user experience (see Figure 4 for a hypothetical example). The numbering in the figure indicates the sequence in which a particular player might experience each point in a set of story arcs. As the player chooses to follow new story opportunities or to continue existing stories, their overall experience realizes deep agency and a complex story structure without requiring prior definition of all potential choices.

In fact, with smooth transitions and interactions among a player's active stories, the experience as a whole begins to resemble a collection of subplots, as in a multiplot movie or novel. Even while following the currently active story, the system can present opportunities to transition to other stories that are in progress, or to additional new

stories. The player, following her current interests, traverses the storyscape naturally, building a complex dramatic experience on the fly.



As we see in the above figure, a rich storyworld enables each story to be simpler while the player experience expands. At every point in the resulting graph, the player has complete freedom to continue a story arc or try something new.

## Completing the Framework

### *Simulation*

Our interactive drama system is designed to work in conjunction with a virtual reality simulation. The simulation layer provides the substrate for a coherent and engaging experience by offering settings, background activity, directable characters, and opportunities for interaction in the virtual world. Thus, the simulation offers rich agency independent of any particular story. When the PNA adds stories to the simulation, players enjoy both deep agency within stories and broad agency throughout the storyworld. The simulation fills in the gaps between stories so that each story need not be watertight.

### *Directed Believable Characters*

Believability of characters in our system derives from appropriate actions in the context of a story, not from free-form autonomous behavior. The Personal Narrative Agent, with instructions from a Narrative Form, directs agents while they are characters in a player's story. The PNA provides content, timing/pacing, and other instruction for agents at the level of a beat or a set of beats within a scene. Characters follow this direction in a manner consistent with their internal state and designed behaviors. When characters are not involved in a story, they revert to simple reactive and motivation-based behaviors consistent with their storyline histories.

## **Implications**

Any automated drama system that is designed to offer only a single story faces a monumental challenge. Because that story (with its variations) represents the totality of the player's interaction with the system, it must handle any action the player might take, without breaking the player's dramatic experience. This inclusiveness causes the "explosion of endings" problem, generating a vast amount of work for writers of interactive drama. To provide a compelling experience for all players, writers using single-story systems must anticipate and provide continuations for essentially all possible player actions.

Since this task is effectively intractable, most story systems work around the problem by ignoring some player actions, assigning default or inappropriate consequences to player actions, restricting the player's freedom to act, or restricting the context in which the player may act. Instead of directly addressing the player-protagonist motivation problem, each of these "work-arounds" negatively impacts the player's immersion and agency, and thus their overall experience.

The main implication of the hypothesis-based multiple-story approach is that each story can be vastly simpler, while the ability to offer many stories makes the overall experience more satisfying for more players. Since we can always offer another story, the cost for abandoning a particular story, which the player either can't follow or finds uninteresting, decreases dramatically. Without the requirement to take every possible action into account, each story can be simple, focusing on the main theme and a few variations rather than thousands of unlikely paths. Writers will be more productive, creating many stories in the time it would take to create one if they had to focus on the minutiae. Writers therefore spend a moderate effort to achieve the most common solutions, and leave the vast number of uncommon situations to be addressed by other stories and the simulation.

## **Future Work**

The conceptual framework we have presented here is in the early stages of implementation. We have several key challenges in addition to realization of the system design presented above:

### *Interpretation of Player Interaction*

We must develop methods to interpret the intent of players' actions as accurately as possible. We hope to build a large library of actions that can be accurately interpreted by the PNA in support of many different stories.

### *User Interface (UI)*

Several aspects of the user interface in virtual storyworlds require future development. In today's interactive entertainment, even tasks as conceptually simple as navigation and choice of action can be confusing for the vast majority of people. The UI presenting these affordances must address the consumer's needs with elegance and simplicity.

### *Language and Voice*

Ideally, interactive drama involves dialog among the human player-protagonist and automated characters, including audio input and output. Advances in voice

recognition, voice generation, and natural language understanding and generation will improve the player's experience. In the meantime, however, we must design interim solutions that allow us to move forward.

### *Story Recognition*

Story recognition is a promising alternative story selection mechanism, in which the story system interprets free-form player actions as possible value transitions and searches for narrative forms that are consistent with the player's actions.

## **Conclusion**

In order to create compelling story experiences in the minds of players, interactive drama must address the needs of both narrative coherence and player engagement. This paper presents one possible solution: the use of narrative hypotheses and multiple stories, which allow the player to reveal and follow her intrinsic motivations within a structured dramatic arc, while neither imposing any *particular* dramatic destiny nor limiting the player's agency.

The framework addresses the "explosion of endings" problem through the use of many, simpler stories taking place in the context of a larger storyworld. Instead of exhausting all the possible endings of a single interactive story, writers are free to craft their story using the most expected paths, leaving the vast number of uncommon routes to be addressed by other stories and the simulation system, or simply ignored.

Our system enables complete freedom of action for the player-protagonist and provides well-formed Aristotelian dramatic experiences based on her intrinsic motivations, simultaneously meeting the needs of both the player and the protagonist. We believe our approach resolves the apparent conflict between the author's desire for control of the story and the player's desire for the freedom of action, making it possible for the dramatic goals and narrative constraints of the author to align with the emotional involvement and intrinsic motivation of the player.

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