A UNIFIED APPROACH FOR RECONCILING CHARACTERS AND STORY IN THE REALM OF AGENCY

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Abstract: In the last decade, a number of computational systems for entertainment and communication have appeared, that share a set of common features, including the use of artificial characters and the reference to drama and storytelling. Systems for interactive storytelling and drama rely on agent theories to model characters, and adopt planning techniques to cope with non-determinism at the story level, combining them according to sophisticate architectural designs. However, a consolidated approach has not emerged yet, that fully reconciles these two dimensions. In this paper, we propose a unifying framework to accommodate the tension between story control and character behavior and we claim that the accurate modeling of agency is a prerequisite to the success of attempts to solve this tension. By using this framework to analyze practical systems we point out that the importance of agency is acknowledged by successful systems, although only implicitly in most cases.

1 INTRODUCTION

In the last decade, a number of systems for entertainment and communication have appeared that – notwithstanding different design goals and conceptions – share a number of common features, including the use of artificial characters and the adoption of storytelling to structure the interaction with the user. These systems rely on multiple modalities for communicating with the user, such as natural language, graphics or virtual reality, and support different styles of interaction, such as dialogue, direct manipulation or embodiment.

For example, the Façade entertainment system involves the user as an active character in a dramatic situation in which a couple whose marriage is falling apart invites her/him for a drink, with wife and husband trying to bring the user on their respective sides. In the interactive storytelling system by (Pizzi et al., 2007), the user is immersed in a virtual reality environment, where he/she plays the part of one of the characters of the French novel "Madame Bovary", interacting with the other characters and affecting their feelings and behavior. In the Dramatour guide application for cultural heritage (Damiano et al., 2006), a virtual character, the spider Carletto, accompanies the visitor in a historical location from a portable device, exhibiting an inner conflict between 'guide' and 'storyteller'. In the FearNot! edutainment system (Aylett et al., 2007), the dynamics underlying bullying incidents in schools is dramatized in a cartoon-like environment, in which the child user intervenes as an empathic observer to give advice to the victim.

Given this heterogeneity of goals and instruments, a first, broad distinction has been established in the literature between story-based and character-based systems (Mateas and Stern, 2003; Pizzi et al., 2007; Theune et al., 2003; Riedl and Young, 2006). Story-based systems are characterized by centralized architectures, in which the behavior displayed by the system, possibly through characters' mediation, is driven by the unifying principle of a story. The story to be conveyed is usually underspecified in some way, so as to provide some limited support to non-determinism and interactivity. Character-based systems rely on the autonomous behaviour of characters to create situations, which are then interpreted as emergent narrative structures (Spierling, 2007).

Whatever the chosen approach, it is widely acknowledged that the author's control over the story

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is related with communicative effectiveness; however, it must be traded off against the autonomy and the believability of the characters. For some specific forms of communication and entertainment, clear design strategies have emerged: for example, in video games, the quality of playability, anchored in carefully shaped and strongly constrained stories, is preferred over the definition of psychologically believable, autonomous characters. On the contrary, AI systems generally envisage interactivity as a main objective, sustained by a rich literature on interactive storytelling and drama (Murray, 1998; Ryan, 2006; Wardrip-Fruin and Harrigan, 2004). However, a consolidated approach has not emerged yet that fully reconciles the two conflicting dimensions of story and characters.

In this paper, we sketch a formal system that systematizes the functions of story and characters in a unified theoretical framework.

By using this framework, we accommodate the components of a variety of practical systems, pointing out the relevance of the notion of agency as a prerequisite to reconciling story and characters.

2 A FORMAL FRAMEWORK FOR DRAMA

The theoretical framework presented in this section lays out the 'language of drama', independently of the form and the media through which specific dramas are realized. Based on previous work by (Damiano et al., 2005), revised here with a particular concern towards the contribution of AI and agents, the framework encompasses the main feature of the practical systems mentioned above.

Given the drama literature (Egri, 1946; McKee, 1997), for 'drama' we intend a form of narrative that describes the story via characters' action in present time and has a carefully crafted premise, i.e., an authorial *direction* that shapes the dramatic climax until its solution.

Given this definition, the drama framework consists of two levels, the *directional level*, that encodes the specific traits of drama, and the *actional level*, that connects such traits with the notion of agency. The directional level of the system (Fig. 1, top) is centered on the notion of *drama unit*. A drama unit (*du*) is any segment of the drama that contributes to the story advancement. Each advancement is due to a change of polarity of some *value at stake* for one or more characters (McKee, 1997); values refer to emotional states or belief states.

Originally expressed by Aristotle as "unity of action", a drama unit provides an effective direction for the story advancement operated by the segment of the story to which it is associated.

Emotional states refer to a cognitive model of emotions like the one stated by Ortony, Clore and Collins (Ortony et al., 1988); this model, largely employed in interactive drama (starting from (Bates et al., 1994)), defines emotion types based on an agent's appraisal of self and other agents' actions, thus naturally lending itself to accommodate the dialectics of characters in drama. Belief states can be any predicate logic formula.

A drama unit can be recursively expanded into a number of children drama units, forming the *plot tree* (Fig. 1, top left). The plot tree is licensed by the formal rules of drama, which pose constraints on the expansion relationship of *du*s (dominance relation in formal grammar terms). In particular, the direction of the parent *du* must include all the *value_at_stake* of children *du*s, with consistent initial and final polarities in case of subsequent changes.

The expansion of drama units into sub drama units stops when, at the basic recursion, drama units are expanded into a sequence of *beats* (*bs* in Fig. 1, bottom). This sequence constitutes the *actional level* of drama. Beats are the minimal units for the story advancement, that will be exposed to the audience.

Beats consist of incident pairs, where incidents are characters' actions – executed as part of their plans – or unintentional events (represented by pairs of adjacent boxes in the central part of Fig. 1). While only beliefs and emotions are represented at the directional level,

at the actional level a model of agency, such as the belief–desire–intention (BDI) model (Bratman et al., 1988), provides the glue that links the behavior of characters into a coherent causal chain and sustains the believability of the characters.

The prescription that the direction is achieved through conflict is captured by constraint that, for each beat,

the intended outcome of the second incident should be incompatible with the intended outcome of the first incident, directly or indirectly.

In order to illustrate how this framework applies to specific drama, we resort to a well-known example, the 'nunnery scene' from Shakespeare's *Hamlet*, describing how the characters' rational and emotional states are plotted by the author to achieve the direction of the scene.[1] For all the segments that compose the scene, we sketch the structure of

[1]The scene has been analysed also by (Damiano and Pizzo, 2008) in an actional perspective.

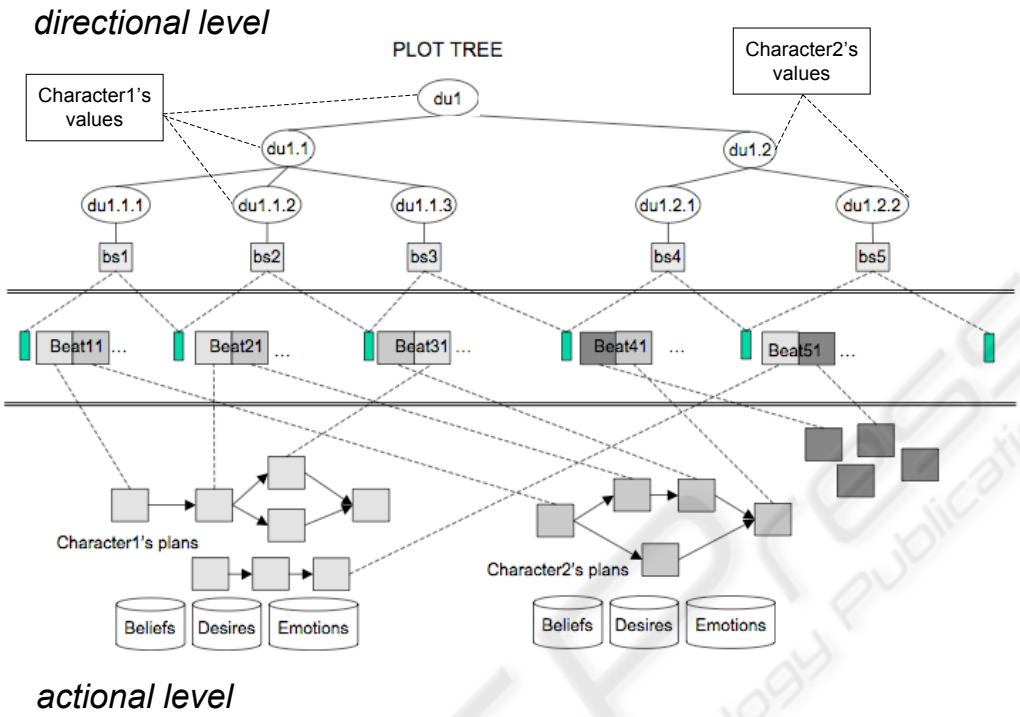

Figure 1: A graphical representation of the formal system of drama. On top, the directional level of drama, i.e. the way it accomplishes its direction through a sequence of elements situated at different levels of abstraction (*dus*), which manipulate characters' values; below, the actional level, represents the anchoring of the direction into the characters' actions contained in beats and rooted in a rational and emotional model of agency.

the scene in terms of characters' values (beliefs and emotions), with the goal of showing how the plot incidents affect these values (a formal derivation is omitted for space reasons). Emotional values refer to the 'ontology of emotions' described in (Ortony et al., 1988); the modifications of values are represented by their changes of polarity.

The scene has a tripartite structure; the value at stake of the overall scene is Hamlet's attitude toward Ophelia (changing from positive to negative), $\langle feel(Hamlet, love\_for(Ophelia)), + \rangle$. In the first part, Ophelia is sent to Hamlet by Claudius to induce him to reveal his inner feelings, $has\_goal(Ophelia, tell(Hamlet, inner\_feelings)))$, as a way to confirm the hypothesis that his madness is caused by his rejected love for Ophelia. In order to do so, she has formed a simple plan that consists of starting an interaction with Hamlet, and asking him to talk about his inner feelings $(has\_plan(Ophelia, (meet(Ophelia, Hamlet), start - interaction(Ophelia, Hamlet), ask(Ophelia, tell($ $Hamlet, inner\_feelings))))$. Hamlet, who does not want to foolish Ophelia (for whom he still has a strong affection), tries to leave her, but is forced to answer by Ophelia's insistence, as she makes subsequent attempts to start an interaction with him. This segment of the scene establishes Polonius' value at stake, a belief state in which he knows that Hamlet is mad because of rejected love $\langle bel(Polonius, mad(Hamlet)), - \rangle$; Ophelia's value is an emotional state that includes *fear* about Hamlet's madness, $\langle feel(Ophelia, fear\_for(Hamlet\_madness)), - \rangle$ and *hope* (related with the fulfillment of her task to convince Hamlet to reveal his inner feelings, $tell(Hamlet, inner\_feelings)$.

At the beginning of the second part, Hamlet reactively forms the goal of saving Ophelia from the corruption of Elsinore court, $has\_goal(Hamlet, save(Hamlet,$ $Ophelia))$, by inducing her to go to a nunnery $(has\_goal(Hamlet, has\_goal(Ophelia, go(Ophelia,$ $nunnery))))$. In order to do so, he resorts to a rhetorical plan to convince her that moral and affective values do not hold anymore, and that everybody, including himself, is corrupted, with the intention that she would spontaneously decide to go to the nunnery $(bel(Hamlet, (bel(Ophelia, corrupted(court))$

$\rightarrow$ $has\_goal(Ophelia, go(Ophelia, nunnery))))$). Hamlet's value at stake is now set to *hope* about Ophelia's decision (and her consequent salvation), $\langle feel(Hamlet, hope(go(Ophelia, nunnery)), +\rangle$, while Ophelia's value at stake is a belief state about the corruption of the court, $\langle bel(Ophelia, corrupted(court)), -\rangle$.

Finally, in the third part of the scene, Hamlet verifies whether he has convinced Ophelia that the court is corrupted, i.e., if $\langle (bel(Ophelia, corrupted(court)), +\rangle$ holds. Prompted by the fact – a contingent event – that he has noticed Claudius and Polonius hidden behind the curtains, $\langle bel(Hamlet, (overhearing(Claudius)), +\rangle$, he realizes that she maybe be lying and asks her where her father is. For Hamlet, this is a way to verify if Ophelia is still subdued to his father's authority. As she answers that her father is at home, her lie, for Hamlet, counts as a confirmation that his plan has failed (since the belief that the entire court is corrupted should retain her from obeying her father): so, Hamlet is upset.

He starts feigning madness again, thus confirming Claudius' and Polonius' beliefs about him, $\langle bel(Polonius, mad(Hamlet)), +\rangle$; the scene ends with Ophelia complaining about her tragic destiny. Hamlet's value at stake is his emotional attitude towards Ophelia $\langle feel(Hamlet, love\_for(Ophelia)), -\rangle$, while his hope to convince Ophelia to go to the nunnery turns into *disappointment*, $\langle feel(Hamlet, hope\ (go(Ophelia, nunnery))), -\rangle$, and *anger*, $\langle feel(Hamlet, anger(not(bel(Ophelia, corrupted(court))))), +\rangle$, At the same time, Ophelia experiences the emotional state of *fear confirmed* about Hamlet's madness, $\langle feel(Ophelia, fear\_confirmed(Hamlet\_madness)), +\rangle$, not at all mitigated by the fact of having accomplished her initial task $\langle feel(Ophelia, self - satisfaction(done(tell(Hamlet, inner\_feelings)))), +\rangle$.

The directional level corresponds to the authorial control over drama; at this level, the author puts the characters' values at stake, abstracting from the actions represented in the plot, with the intent of establishing the story meaning by manipulating the characters' values. The outcome of an incident, be it action or event, affects the characters' values that are put at stake at the directional level, so that the the story advances at the directional level as prescribed by the author. However, the outcomes of characters' actions not only affect their values, but must be coherent with their goals; also, unintentional events must be plausible as naturally occurring (like the revelation that Polonius and Claudius are hidden behind the curtains in this scene).

For instance, in the third part of the example scene, Hamlet formulates the goal of knowing whether Ophelia is lying or not, as a way to monitor the actual outcome of his rhetorical plan to convince Ophelia that the court is corrupted and subtract her from the submission to her father. By choosing to do it by asking Ophelia about her father, he opportunistically exploits the circumstance – of which he has just become aware – that Claudius and Polonius have been hiding behind the curtains to eavesdrop. Hamlet'plan to know if Ophelia is sincere consists in asking her directly, and when he comes to know that Ophelia is lying, his *value_at_stake* of *hope* is consequently set to a negative value. At the same time, since drama units are part of a hierarchical structure, Ophelia's answer affects Hamlet's *value_at_stake* for the overall scene, i.e., it turns Hamlet's love to a negative value, a change of major importance for the entire play.

As this short excerpt illustrates, at the actional level, even sophisticated characters like Shakespeare's show the typical behavior of rational agents: they recognizably have goals, they form plans to achieve them and monitor the execution of those plans, a behavior that is apparent in the acts performed by Ophelia and Hamlet. Moreover, they reactively form new goals (e.g., Hamlet decides to act so as to save Ophelia from the corruption of the court when he realizes the necessity and the opportunity to do it) and drop the goals that have proven unachievable (see Hamlet's utter disappointment when confronted with his failure, and the similar feeling displayed by Ophelia by the end of the scene). Rationality, then, is integrated with the emotional states that are determined by the appraisal of the characters' own goals and of the other characters' goals; emotional states in turn affect the deliberative processes of the characters, by providing the motivation for action, thus yielding the complex interplay of emotions and rationality that can be observed in drama.

3 APPLYING THE FORMAL FRAMEWORK TO PRACTICAL ARCHITECTURES

In the following, we use the framework sketched in the previous section as a conceptual instrument to analyze a sample of systems, that span a multiplicity of relevant approaches and are characterized by the use of a variety AI theories and techniques. With respect to the dichotomy between story-based and character-based approaches, the adoption of a unifying formal

framework brings the advantage of situating different systems against a background in which the two dimensions of story and characters are explicitly put in relation, thus providing a common evaluation grid. Moreover, the way each system copes with the tension between story design and characters' autonomy has relevant consequences for the role of the procedural author (Murray, 1998) who will input the knowledge in the system.

3.1 Directional Level

In practical systems, setting the focus on the directional level corresponds to giving the author direct control on the direction of the story and frustrating the autonomy of characters. Since the directional level manipulates facts that relate, more or less directly, with the properties of characters (represented by the 'values at stake' in the drama framework), the internal structure of characters – a sum of emotions and beliefs – must be represented in a more or less explicit way.

Without a representation of this kind, it would not be possible, for example, to set up intriguing situations in which the characters' values are affected by their intentional behavior, but in the opposite way than planned by the characters themselves. For example, Hamlet's attempt to save Ophelia, motivated by his love for her, is not only frustrated but ends up turning into disappointment the feeling that initially prompted him to act.

The intentional aspects of the characters' behavior, then, are dealt with in different way. A strategy consists of infusing a representation of the intentions of the character at the level of story control, so as to constrain the evolution of the story to coherent character behavior; or, reversing the perspective, the autonomy of characters in the system can be constrained to sequences of actions that are known to be consistent in advance, a typical property of pre-compiled plans.

In general, story-based systems tend to operate at the directional level and incorporate sophisticated story models (object-level knowledge about the semantics of drama according to the drama framework) to account for the structural aspects of narration and drama, ranging from semiotic structuralism (Szilas, 2003; Peinado and Gervás, 2004; Hartmann et al., 2005) to cognitive models of story understanding (Swartjes and Theune, 2006). The knowledge about story generation has often been encoded in the form of logical rules, like in DEFACTO (Sgouros, 1999) and the IDtension (Szilas, 2003). These systems closely resemble expert systems, mixing the empirical and theoretical knowledge of the author in a set of rules that the system uses to generate the story; the effectiveness of these systems seems to be directly connected to their ability to integrate actional operators and emotional aspects.

Alternatively, a family of successful systems resort to AI planning for the generation of the story. In these systems, the planner may replace the author in devising the plot: planning operators are represented by a set of possible plot incidents (Riedl and Young, 2006), which can be combined in a consistent sequence to achieve a transition from a author-defined initial and final state, with explicit constraints on the ordering of incidents and their causal relations (where intentionality can represent a weak form of causation). Or, the planner may be in charge of solving a planning problem from the perspective of the story characters, delegating the control over the direction to the author's capability of encoding full-fledged drama units into joint planning operators (Mateas and Stern, 2005).

The control over the story direction is largely preferred to the manipulation of characters when it comes to designing authoring tools, as exemplified by a recent generation of systems (Weiss et al., 2005; Iurgel, 2006; Medler and Magerko, 2006). In particular, (Medler and Magerko, 2006) propose a hybrid, layered language for drama representation in authoring tools, aimed at allowing the author to design the story at the directional level, as a partially ordered set of plot points, while leaving the story generation system the task of mapping this representation onto a planning formalism. Similarly, the Automated Story Director (Riedl and Stern, 2006) confines the autonomy of characters to the generation of low-level behaviors based on action libraries, giving to a 'drama manager' (Mateas and Stern, 2003) the responsibility for monitoring the story advancement to preserve, during the interaction with the user, the story goals encoded by the author.

Moreover, within each family of systems (rule-based, planning-based and hybrid), several alternatives are available concerning the techniques employed and the system architecture.

The Mimesis (Riedl and Young, 2006) storytelling system, explicitly aims at constraining the interaction with the user to the realization of a specific direction. The story is generated offline by a partial order planner given the direction posed by the author; the planner assembles actions executed by a set of characters in order to construct an overall plan that fulfills the goal stated by the author. The plan is analyzed to detect the potential impact of user's input, and converted into a conditional plan in which this in-

put is accounted for in advance. This powerful technique, called 'narrative mediation', allows the author to know, in full detail, the possible forms of the plot.

At the same time, the system sees to it that the intentions of the characters remain clearly recognizable to the user along the plan, and that no actions are inserted into the plan only to meet the needs of drama, without being part of the motivational structure of the characters. The core of this system clearly operates at the directional level; however,the representation of the characters as agents is acknowledged, though indirectly, by the use of "intention frames", motivational accounts with which the actions included in the plot are annotated. A drawback of this strategy is that the mental state of the characters are accounted for only indirectly, blurring the conceptual distinction between the goals that are individually pursued by the characters and the drama goal.

The Façade system (Mateas and Stern, 2005) is designed to conduct an interactive drama to a clearly stated set of outcomes, in which the couple of protagonists either split or remain together (see Section 1), with the user being neutral or sympathizing for one of the two sides. In Façade, the richness of the user experience resides in the user becoming a protagonist of the story, triggering (but not controlling) the evolution of the plot towards one of the available directions. The generation of the plot is obtained through a hierarchical plan language (ABL), that encodes multi-agent, joint plans; the plan language also accounts for the role of the user in the joint action. Using ABL, the author defines a set of beats, which represent interpersonal conflicts among the characters. The inclusion of the joint plans in the interactive story is then affected by the interaction with the user and guided by a measure of the plot emotional value.

This system lends itself to represent stereotypical situations of western drama, in which the perspective on characters is somewhat reversed with respect to the rational and emotional approach to agency underpinning the formalization we propose: in Façade, the characters tend to be shaped by the actions they perform and the things they say in the space of the interpersonal relations, instead of being stated by an a priori definition of their mental state from which intentions can subsequently be derived, according to the standard practice that characterizes agent architectures (Rao and Georgeff, 1991; Wooldridge and Parsons, 1999). For this reason, even if this system operates at the directional level, it is situated mid-way between the directional level and the actional level.

3.2 Actional Level

In general, character-based systems are situated at the actional level of the drama framework proposed here. They tend to take an improvisational approach to drama, close to the "comedy of the art" tradition, first translated in a computational architecture by the work of Hayes-Roth (Hayes-Roth et al., 1995). According to this paradigm, drama emerges from the interaction of a set of characters, constrained to specific roles. This approach – whose realization has been encouraged by the availability of conceptual and practical tools to implement the characters' deliberation – conflicts with the realization of a specific direction. This situation corresponds to having a strongly underdetermined direction, subsuming a large variety of plots, or not having a specified direction at all.

It is worth noting that practical systems tend to equate the autonomy of characters to the deliberative processes and to use planning techniques for this processes, relegating the representation of the characters' mind to the use of truth maintaining systems and delegating the plan monitoring activity to the built-in features of planning–and–execution environments. This approach, although effective in the practice, does not allow the author to explicitly plan effects like frustration or self-reflections that, although sophisticated, are pervasive in drama. For example, turning back to the excerpt analyzed in Section **??**, think of the iterated attempts performed by Hamlet to take revenge on Claudius all along the play, and his frustrated attempt to subtract Ophelia from the corruption of the court, conducted through a rhetorical plan whose execution encompasses monitoring actions of primary dramatic importance.

As an example of this approach, consider the 'Friends' system (Cavazza et al., 2002), in which the behavior of each character is generated by a hierarchical planner. Characters are committed to specific goals (like seducing another character), and reactively form intentions (i.e., partially instantiated plans) to achieve them. The user interacts with as a 'deus ex machina' with them by cooperating (for example, giving suggestions) or conflicting (for example, preventing actions); the actions of the user affect the behavior of the characters, either influencing their future deliberation (characters' high level plans are detailed out only when execution approximates, leaving room for the user's advice) or forcing them to replan. The characters are executed concurrently, so that further conflicts that are not envisaged by the autor may emerge from their interaction.

From the author's point of view, the use of the hierarchical task network (HTN) planning paradigm allows a more direct control of the development of the

plot, since it directly connects the characters' behavior with the specification of their goal; as a drawback, it reduces the responsiveness of the system, that must recur to replanning techniques to display a flexible behavior. In this sense, the system is a compromise between the autonomy of the characters at the actional level and the control over the story, since their behavior is constrained to a well defined set of hierarchical plans. Although a proper representation of the characters as agents is not present in the system, the use of HTN planning indirectly gives a certain stability to the behavior of characters, who keep at the same time the capability to replan, a requirement posed by the analysis of real plots. In practice, stating the drama direction in terms of the characters' goals releases the control over story; from a theoretical perspective, it collapses the distinction between the directional and the actional level, since the former should abstract from how actions are represented in the system.

In system described by (Pizzi et al., 2007), the focus is on the responsiveness of characters' emotional attitudes. The behavior of each character is generated by a heuristic-search planner, and planning is limited to the selection of the next action, to cope with asynchronous user intervention without resorting to replanning. The planning operators represent 'feelings', that manipulate the mental state of the characters. An informal ontology, extracted from the novel inspiring the story, Madame Bovary, defines how characters' feelings vary and evolve as a consequence of the changes in their beliefs, and how they affect the characters' behavior.

The author's control over the system is confined to the actional level, and consists of defining the initial mental state of the characters and a set of planning operators for each character. The resulting initial situation is open to opposite endings, depending on the user's input and the moment this input is provided. The notion of conflict is mostly internal to the characters' mental states, which can evolve towards different final outcomes as a consequence of feelings.

This system is strongly committed to the actional level of drama: within this dimension, it clearly privileges the accuracy of the emotional modeling of the characters; it does not contain an explicit notion of direction to provide a stronger control on the story development; characters, in order to appear responsive and thus to gain the user engagement, exhibit an emotionally-based behavior rather than being driven by explicitly coded intentions, encouraging the user to explore, rather than to 'direct', the advancement of the story. From the author's point of view, the possibility for the user to affect the beliefs and feelings of the characters at any time, and the use of heuristic–search planning (HSP), are likely to determine a large plan space, leading to hypothesize a methodology consisting of iterative testing to tune the behavior of the system to the (unstated) author's direction.

4 DISCUSSION AND CONCLUSIONS

Although there is a general agreement about the role played by characters and plot in practical systems, the complex relations between the two have received much less attention, a situation that can be partly attributed to the fact that the notions of character and story, taken in isolation, rely on generally agreed upon models (autonomous agents, planning and graph theories).

As a partial acknowledgment of the importance of the direction to build an operational model of drama, however, it has been amply recognized that the main difficulty encountered by the interactive systems is to reconcile the authorial control over the plot (i.e., the direction) with the interaction with the user (see Introduction).

In this paper we have sketched a formal framework to represent the domain of drama, aimed at accounting for the interdependencies of the two levels of drama, i.e., direction and actionality, at which the notions of plot and characters are respectively situated. The informal analysis of a classical example through this framework has helped out to point out that a detailed model of agency is necessary to grasp the behavior of characters in actual plot. Successful systems seem to confirm this assumption, since they rely on some key notions of agent and multi-agent theories (such as the properties of intentions, reactivity, meta-deliberation aspects and so on) to reconcile story and characters, although these notions are often only implicitly modeled.

As a future work, we envisage the tasks of giving to the framework a more complete formalization, and to test its validity on a larger sample of systems and plots, giving an accurate account of how the various aspects of agency are tied to the properties of plot at the directional level of drama, and how their explicit modelling affects the expression of the author's goals. In particular, future research should address aspects like the passive and active monitoring of action effects (clearly visible in Ophelia's attempts to gain Hamlet's attention in the first part of the scene analyzed in Section **??**), the reasoning about one's own intentions (visible, for example, in Hamlet's sudden decision to affect Ophelia's behavior by convincing her to go to a nunnery) and meta-deliberation capabilities (Ham-

let's decision to return to his pretended madness as a result of his personal failure with Ophelia, dropping the infeasible goal to save Ophelia). Finally, since the definition of drama lays out a multi-agent context, an account is also needed of the relations between individual agents, including cooperation, conflict and the social and institutional relations that affect the motivational structure of the characters.

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