Paper choice

W.-P. Su, B. Pham and A. Wardhani,
Personality and Emotion-Based High-Level Control of Affective Story Characters,
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Abstract

After modification of the original paper *abstract* (in red)

Human emotional behavior, personality, and body language are the essential elements in the recognition of a believable synthetic story character. This **project proposes** an approach using story scripts and action descriptions in a form similar to the content description of storyboards to predict specific personality and emotional states. By adopting the Abridged Big Five Circumplex (AB5C) Model of personality from the study of psychology as a basis for a computational model, we **propose to** construct a hierarchical fuzzy rule-based system to facilitate the personality and emotion control of the body language of a dynamic story character. **The goal is that** the story character can consistently perform specific postures and gestures based on his/her personality type. Story designers can devise a story context in the form of our story interface which predictably motivates personality and emotion values to drive the appropriate movements of the story characters. **We expect** our system **to** take advantage of relevant knowledge described by psychologists and researchers of storytelling, nonverbal communication, and human movement. Our ultimate goal is to facilitate the high-level control of a synthetic character.

Project objective

Excerpts from the *introduction* (¶1,5)

Current narrative intelligence research emerges from several areas such as interactive drama, interactive cinema, virtual theater, immersive storytelling, and emer- gent storytelling. Generally, such research can be divided into three major groups: authoring, story, and character- based models. They aim to address the problem of generating interactive narratives and different narrative design approaches for user experience. To a character-centric story-telling system, character expression is the essence of believability.

The overall goal of our **proposed** system is to provide a visual platform for these intelligent actors to simulate storytelling sequences with consistent personality performance and reflection of inner feelings or emotions. **The operating mode will be the following**: from story contexts, the meaning of the text itself and the characters body languages are annotated to predict the possible personality type and emotional status of a character; the results are then used as inputs to the Personality and Emotion (P&E) Engine; in the P&E engine, the personality type coupling with emotional inclination results in the characters possible postural values.

In summary, our project focuses on three essential tasks for devising a better character controlling mechanism as follows:

1. modeling high-level psychological directives,
2. classifying body languages used in story performance,
3. devising story input module to decode the meaning of narrative contexts .

Background of research—A. Work done by others

Excerpts from the *introduction* (¶2-3)

Personality can be used to predict the type of a story character and her/ his behavior type. Emotion and behavior types influence the representation of an individual including the stance, walking posture, gesture, facial expressions, etc. There are some previous computational models related to personality. Chittaro and Serra [2] proposed a goal-oriented approach to character programming based on probabilistic automata and personality. Rousseau [3] has developed a model of personality based on Myers-Briggs psychology theory and used in a virtual theatre project. Our model of personality traits is based on De Raads Abridged Big Five Circumplex (AB5C) Model [4], which systematically classifies person- ality traits to detail analysis. Likewise, emotional synthesis is a perennial challenge. Amaya et al.'s emotion transform [5], Unuma et al.'s Fourier function models [6], Rose et al.s Motor Interpolation System [7], and Wilsons artificial emotion engine [8] are designed to generate varieties of rich emotional behaviors for autonomous characters. Moreover, Velasquez investigated a model of emotions, mood, and temperament that provides a flexible way of controlling the behavior of autonomous entities [9]. Perlin and Goldberg used stochastic noise functions to simulate personalities and emotions in exiting animation [10], [11].

Interpersonal communication is characterized not only by verbal, but also by visual communication. Between 60-80 percent of our message is communicated through our body language and only 7-10 percent is attributable to the actual words of a conversation [12]. Nonverbal communication includes facial expression, gaze, gesture, posture, bodily contact, spatial behavior, nonverbal vocalizations, clothes, and the other aspects of appearance [13]. Several researchers have built animated embodied conversational agents that synthesized speech with animated hand gestures. Chi et al.s Emote system is based on Laban Movement Analysis (LMA) for an expressive motion and upper-torso gesture synthesis [14]. Egges et al.s motion synthesizer is for posture variation and personalized change of balance using motion captured example animations [15]. In their BEAT project, Cassell et al. used the McNeill gesture and dialogue semantics to generate the gesturing behavior of autonomous characters [16]. Andre et al. generated pointing gestures as a subaction of the rhetorical action of labeling [17]. Stone et al. spliced together clips of sound and motion and resynchronized them to create an animated delivery of a meaningful utterance [18]. Most of the previous works focus on gestures performed by hands and arms.

Research plan and methodology

Excerpts from the *introduction* (¶2-3)

Our project focuses on three essential tasks for devising a better character controlling mechanism as follows: 1) modeling high-level psychological directives, 2) classifying body languages used in story performance, and 3) devising story input module to decode the meaning of narrative contexts.

First, personality, emotion, self-motivation, social relationships, and behavioral capabilities are the fundamentals for providing high-level directives for autonomous char- acter architecture. The conceptual diagram of our **proposed** system is shown in Fig. 1.

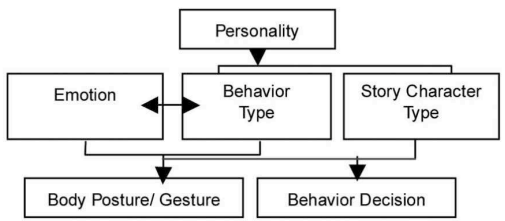


Fig. 1. Hierarchical structure of personality and emotion effects.

Following the current approaches in the literature, we **propose** that our character motion derives from the understanding of emotional behavior and elements of human personality. We **will** alter character motions derived from procedure animations. Comparatively **to the literature**, our approach **will** focus on integrating both compositive factors of person- ality traits and emotions with character motions. These cognitive factors **will be** analyzed to map to the behavioral characterization of characters. Our motion model **will be** controlled by a fuzzy logic controller of psychological elements, resulting in different subtle performances.

Research plan and methodology

Excerpts from the *introduction* (¶3-5)

Second, **we observe that** there are other signals used during communications, for instance, body posture. Moreover, in a story performance, a set of predefined motions is usually used repetitively. Therefore, we **will** focus on fine- tuning these exiting motions by modulating the variations in personality to differentiate the actions of different characters.

Third, we **will** study the character acting and reacting believability in story dialogues from the perspective of nonverbal communication to characters postures and actions. In a computational narrative interaction, synthetic actors who display their body languages directly derived from an action selection mechanism usually lack the refined modification of personality and emotion. Moreover, nonverbal communication and psychological ingredients are not taken into account. **Thus, we will** study believable agents that use nonverbal communication derived from psychological models (personality and emotional state) to influence their behaviors. We **will** focus on how to analyze the character personality and emotion from specific context information in a form similar to the content description of storyboards.

The overall goal of our system is to provide a visual platform for these intelligent actors to simulate storytelling sequences with consistent personality performance and reflection of inner feelings or emotions. A schematic diagram of system overview is shown in Fig. 2.

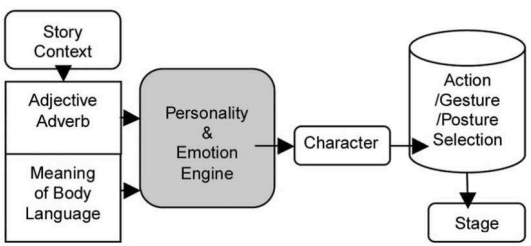


Fig. 2. System overview.

Research plan and methodology

Excerpts from the *introduction* (¶6) and *conclusion* (¶1)

Project schedule:

We **will first** analyze research questions and challenges, **and** examine the relationships between narrative intelligence and the essentials of dynamic character design. We **will then work out our** computational model, **by constructing** a hierarchical MIMO fuzzy rule-based system for the P&E engine to generate body expressions from a story characters personality and emotion states. **This model will be validated by the analysis of** testing results.

High-Level Control of Affective Story Characters

The Problem

Being able to use story scripts and action descriptions in a form similar to the content description of storyboards to predict specific personality and emotional states.

Why this is interesting

Story designers can devise a story context in the form of our story interface which predictably motivates personality and emotion values to drive the appropriate movements of the story characters. The ultimate goal is to facilitate the high-level control of a synthetic character.

High-Level Control of Affective Story Characters

Our proposal

Provide a visual platform for these intelligent actors to simulate storytelling sequences with consistent personality performance and reflection of inner feelings or emotions.

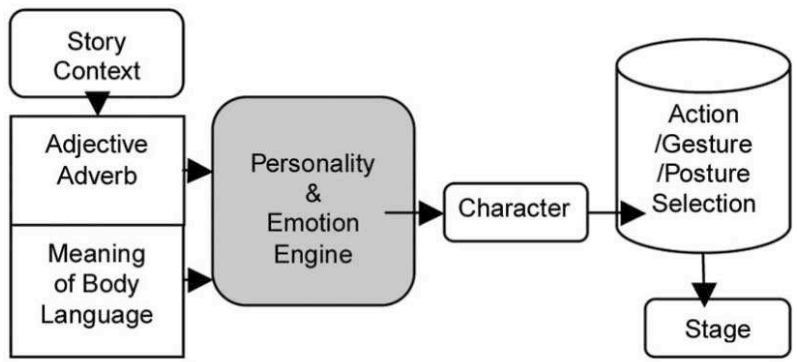
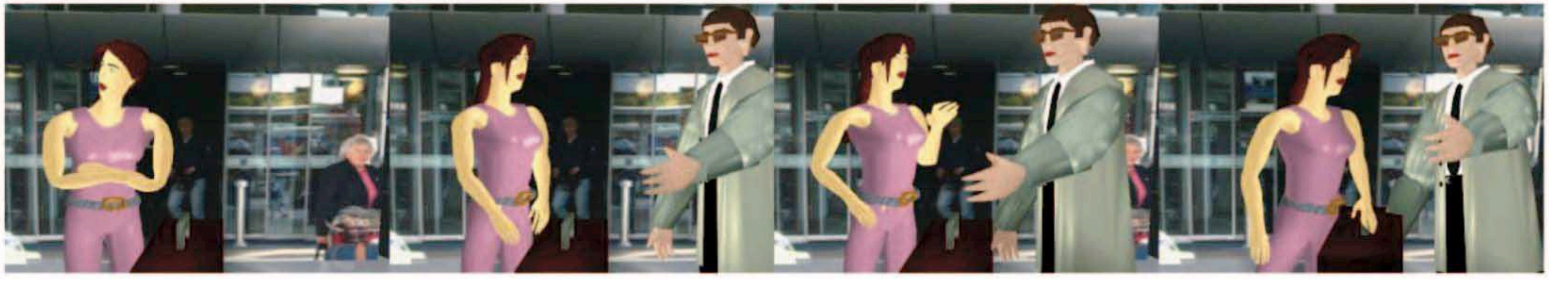


Fig. 2. System overview.

High-Level Control of Affective Story Characters

Example



(a)

(b)

The comparison of two different scenarios. (a) She nervously looks around. She clenches her arms in lower position. She then follows the man. (b) She nervously looks around. She nibbles her fingers. She has her arms akimbo, leans backward, and yells. She then walks away.

High-Level Control of Affective Story Characters

Conclusion

We have constructed a hierarchical MIMO fuzzy rule-based system for the P&E engine to generate body expressions from a story characters personality and emotion states.

Future work

How to let a user interact with a character and abide by the essence of drama is the next challenge. Moreover, further formal evaluations will have to be carried out.