Composite Behavior Synthesis Technique
for Mental Communication Games

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1 Introduction

Mental communication with characters is important for many entertainment and edutainment applications. Human's mental statuses are complex, and mental behaviors typically consist of multiple components such as posture and many unconscious movements. In this paper, we propose the layered behavior synthesis technique for integrating mental behaviors and conversational gestures. We compose various mental behavior representations by considering the spatial consistency and co-occurrence probability. We also show an example of a game using the mental behavior synthesis technique.

2 System Configuration

Figure 2 shows the concept of the behavior synthesis technique based on the mental status of the character. By combining poses, conversational gestures, and unconscious movements, we can add psychological impression to conversational gestures. We build motion unit network to control the occurrence probability and continuities of motion units. Each motion units are indexed by mental parameters p (Figure 1). As a typical example, we define p={$interest, agreement, superiority$}. When utterances and metal parameters are given, we calculate evaluation values to select the most proper combination of postures, gestures, and unconscious movements along time.

3 Mental Communication Game

In this game, a user needs to choose appropriate utterances by guessing CG character's mental status. Figure 4 shows the example of the game. The user has to select the correct answer by estimating character's interest from its behaviors to get rare items. Figure 4 (a) and (b) shows the differences between only conversational gestures and composite mental behaviors. We can see that mental impressions can be integrated during conversations.

Figure 1: Motion Unit. Motion data is associated with mental impression values.
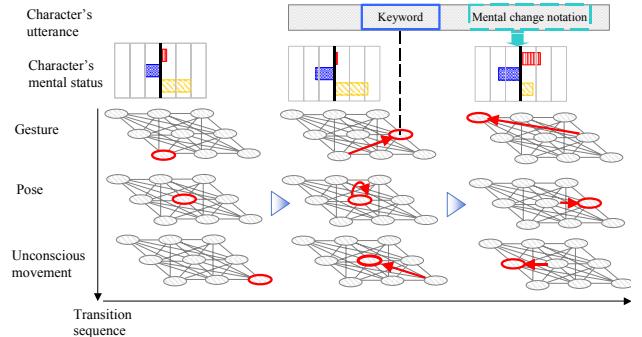

Figure 2: Layered behavior network architecture
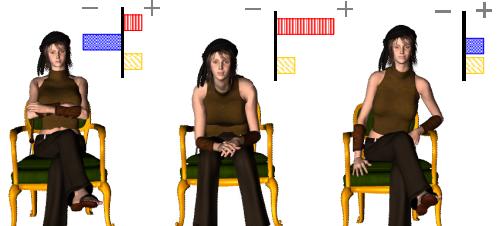
Figure 3: Example of poses representing mixed mental status. The composition of the parameters and the association with the gesture elements can be customized by the animators. The spatial consistency of the postures and conversational are taken into account during planning phase.

(a) Only conversational gestures

(b) Composite behaviors
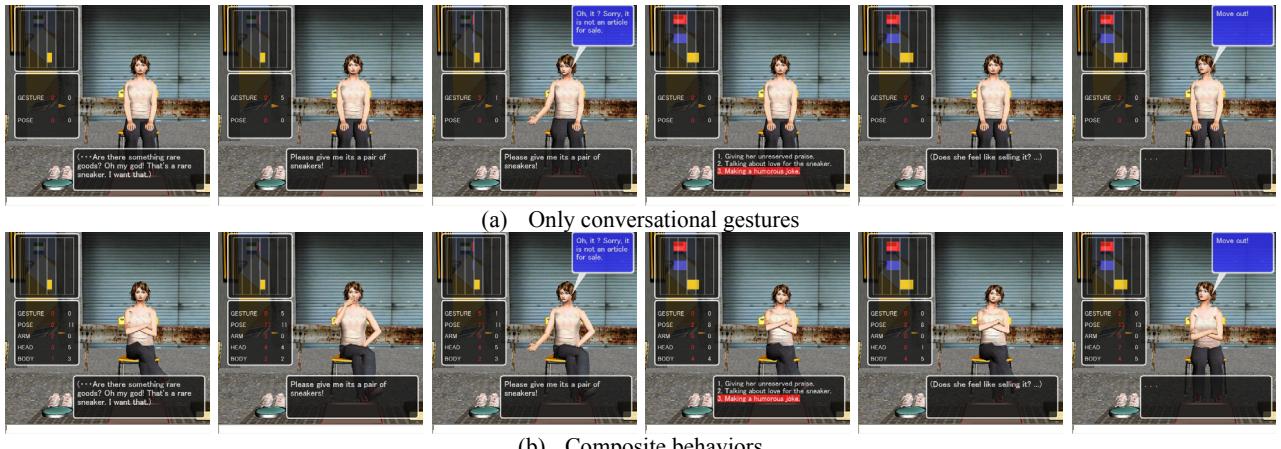
Figure 4 Comparison of conversational gestures and composite behaviors