

Individualized Virtual Humans for Social Skills Training

H. Chad Lane

University of Southern California
lane@ict.usc.edu

Abstract. Virtual humans are now being used as role players for a variety of domains that involve social skills. In this paper, we discuss how such systems can provide individualized practice through dynamically adjusting the behaviors of virtual humans to meet specific learner needs.

Keywords: virtual humans; social skills; pedagogical experience manipulation.

1 Introduction

Pedagogical agents are most often designed to play the role of tutor or peer [1] in virtual learning environments. Over the last decade or so, a new breed of pedagogical agents have emerged that act as the *object* of practice – i.e., it is the interaction itself (with the agent) that is intended to have educational value. Here, the agent is usually a *virtual human* who is playing some defined social role in an interaction that requires application of specific communicative skills. In this paper, we briefly explore some methods for providing adaptive guidance *through* the virtual human role players.

2 Towards Individualized Practice with Virtual Humans

From supporting anti-bullying and intercultural learning with children [2] to negotiation skills for professionals [3], a number of mature systems now exist for the practice and learning of social skills. Given the richness of human interactions, it should be no surprise that the space of adjustability in virtual humans is vast. *Nonverbal behaviors*, such as gaze, nodding, and gestures, play a key role in the expression of emotion and thus it is possible to convey a great deal of implicit feedback through them (examples are shown figure 1). The information conveyed in the *content* of an utterance represents another critical dimension in the space of configurability. Finally, many virtual humans perform task-based reasoning and behave based on *underlying representations* of the dialogue, their intentions, desires, the task domain, and their emotions [2-3]. Manipulation of these underlying models for pedagogical purposes represents a third category. Given these dimensions, some broad categories of support that are possible through tailoring of behaviors include:

1. support *recognition* when errors are committed or ideal actions taken
2. provide an *explanation* for observed reactions and emotional state changes
3. suggest a *repair* for how a learner might revise their beliefs



Fig. 1. Expressions of anger, skepticism, appreciation, and umbrage by virtual humans [3]

The goal is to provide feedback while maintaining the narrative context and not detracting from the perceived realism of the experience. Some examples of how a character might achieve these goals include:

1. amplification of virtual human response behavior, such as the intensity of facial expressions or use of emotionally charged vocabulary (recognition)
2. description of a causal link between a user action and a negative (or positive) result via additional content (e.g., “Why would you say...?”; explanation)
3. clarification of a relevant domain concept by including it in the content of an utterance (“I can tell you that...”; explanation; repair).
4. highlighting of an alternative communicative action that would have produced a better outcome (e.g., “If I were you, I’d ...”; repair)

The central idea behind all of these strategies is to build on the existing feedback already coming from the virtual human, but alter it to achieve a pedagogical goal. We have implemented strategies for amplification and clarification in a prototype system.

An important question is whether such adaptations threaten fidelity and the implications of that. If learners figure out the characters are secretly “helping”, does it impact learner affect and motivation to engage? Future studies will need to address these questions as well as determining if support from pedagogical experience manipulation can be as effective or extend help delivered by a tutoring system.

References

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