World Academy of Science, Engineering and Technology
International Journal of Computer and Information Engineering
Vol:12, No:08, 2018

A Multimodal Dialogue Management System for Achieving Natural Interaction with Embodied Conversational Agents

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Abstract : Dialogue has been proposed to be the natural basis for the human-computer interaction, which is behaviorally rich and includes different modalities such as gestures, posture changes, gaze, para-linguistic parameters and linguistic context. However, equipping the system with these capabilities might have consequences on the usability of the system. One issue is to be able to find a good balance between rich behavior and fluent behavior, as planning and generating these behaviors is computationally expensive. In this work, we propose a multi-modal dialogue management system that automates the conversational flow from text-based dialogue examples and uses synchronized verbal and non-verbal conversational cues to achieve a fluent interaction. Our system is integrated with Smartbody behavior realizer to provide real-time interaction with embodied agent. The nonverbal behaviors are used according to turn-taking behavior, emotions, and personality of the user and linguistic analysis of the dialogue. The verbal behaviors are responsive to the emotional value of the utterance and the feedback from the user. Our system is aimed for online planning of these affective multi-modal components, in order to achieve enhanced user experience with richer and more natural interaction.

Keywords : affect, embodied conversational agents, human-agent interaction, multimodal interaction, natural interfaces
Conference Title : ICEC 2018 : International Conference on Entertainment Computing
Conference Location : Paris, France
Conference Dates : August 27-28, 2018