Experience Based Adaptive Vocal Interaction System for Domestic Service Robots

Sajila Dimagi Wickramaratne

(168077J)

Thesis submitted in partial fulfillment of the requirements for the degree Master of Science in Electrical Engineering

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Abstract

Domestic service robots have gained an increasing popularity in the recent times due to the lack of personnel to tend to domestic work. Domestic service robots with conversational capabilities can be sought out as an exceptional solution to eliminate the mental distress among the elderly. The conversational skills of the domestic robots are currently not comparable to the human level. Only a few researches have been carried out in order to study how the decisions regarding the conversation are made. Humans use a wide variety of non-verbal entities to determine the state of the conversation and manage the conversation flow to ensure that it is interesting to all the parties involved.

The current conversation systems used in service robots frequently use the linguistic message of the user. Most of these systems consider factual and behavior related conversations. Such systems are unable to comprehend the dynamic situations such as the emotional state of the user when generating a response. Systems which can handle the dynamic states of a conversation are preferred by the users. This research is aimed to close the gap between the use of emotions for conversation systems compared

This research proposes a system can be used to make interaction decisions regarding conversation flow by considering the emotional state of the user. In a human conversation both linguistic and para-linguistic features are used to convey information. The proposed system also use this information from the users' response to identify the emotional state and the actual linguistic message. The system comprises of three segments which are emotion recognition, emotional memory storage and conversation decision unit. These three systems coordinate together to decide whether the decision should be continued or not , if it is going to get continued what should be the response and what are the important elements in the user's response that should be retained in system's long term memory.

***Keywords*-Conversation, para-linguistic, linguistic, emotions, service robot, human-robot interaction**

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