



Disclosure with an Emotional Intelligent Synthetic Partner

Introduction

To talk and write about one's feelings has a beneficial effect on one's physical and psychological health. More specifically, conversation evoking disclosure of emotions and traumatic events has a positive effect on one's health, rather than chitchat. Astronauts on a mission, for instance, are exposed to stressful situations, without the presence of a therapist or even comfortable communication with home base. Given that it is important one is able to express one's feelings regularly, this situation clearly is a threat to success of enduring space missions. Since no human-to-human psychological support can be offered during such a mission, one has to resort to other means of support. The present study focuses on written dialogues between a human subject and an emotional intelligent relational agent, which we call the *Synthetic Partner (SP)*. By recognizing emotional content in a conversation, and responding accordingly, the system will stimulate emotional disclosure. We think disclosure through expressive chat with SP will help decrease the probability of psychological health risks.

Design

The design (Figure 1) is based on a *chatbot* extended with emotion extraction and reflection capabilities. In the *Emotion Extraction* module, SP extracts emotional content from the

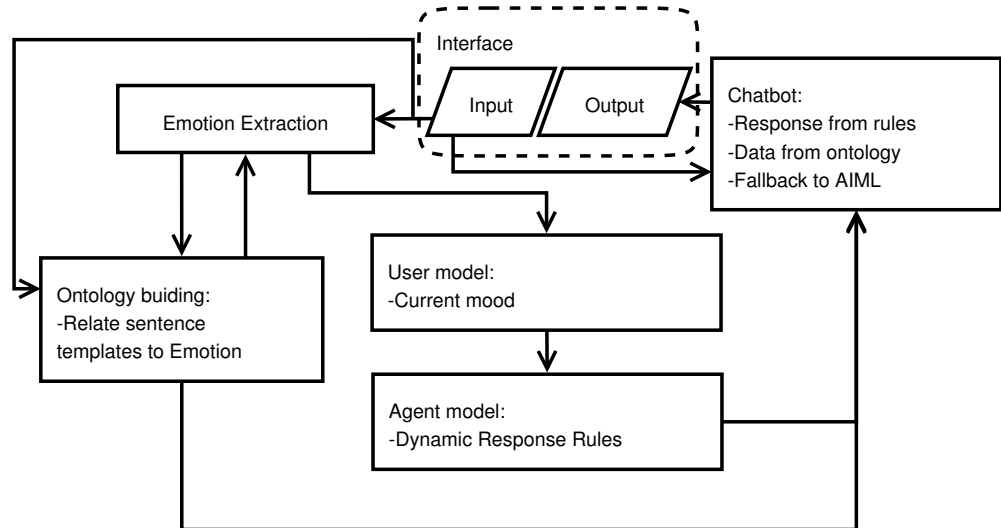


Figure 1: The Synthetic Partner design.

user's input, through a process of syntactical and semantic analysis. This will result in an emotional state or mood. With this emotional state the system can keep track of the emotion in the *User model*. The *Agent model* contains a set of response rules, with which the system can determine its emotional response.

Emotion recognition in future input is facilitated by storing past emotional events in the *Ontology building* module. This will enable the agent to adapt to a specific user, performing better as the conversation progresses.

Additionally, Ontology building can be used by the chatbot to query for user supplied facts (Figure 2). This will make the agent more personal, because it will not have to adhere to the default sentence templates. It can refer to passed events in the ontology by extending these sentence templates.

Application

The system can be used in situations where human-to-human social support is limited or not available and therefore augmentation or replacement of human-to-human conversation is desirable, such as in enduring space missions. Subjects tend to disclose only to intimates and on those moments which suit them best. The SP is an answer to these demands and is available on demand.

Goals

The goal of the present research is to eventually develop an emotional intelligent conversational agent that facilitates disclosure. The SP should be tailorable to suit other domains as well, such as for the military, civil healthcare, or for commercial use.

Future Research

Future research may aim to study for long-term effects of the SP. Furthermore, the possibility to add therapeutic elements, addressing the user's social and cognitive behaviour, seems promising as well. The effect of embodiment and emotion recognition based on other modalities, such as the facial, vocal, or physiological modality, is still subject for future investigation.

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User> Today I had a terrible experience
SP> Oh, that's sad to hear. What happened?

User> We were having problems with our oxygen supply
SP> That must have been frightening

User> Yes, I was very afraid
SP> Can you describe this feeling?

User> I have never been this afraid.
SP> Did it feel like last week, when you were afraid?
    
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Figure 2: Conversation examples with Synthetic Partner.