

Conversational Agent with Emotional Intelligence

Ing. Petra Javorková supervised by Ing. David Procházka, Ph.D.



1 MOTIVATION

A conversational model can assess and predict how an event is likely to influence a person's emotional or psychological state, and understand the person's feelings in both closed and open domain conversation settings.

2 METHOD

This paper deals with the design and implementation of a chatbot that detects emotional state, creates different response mechanisms, integrates commonsense, and models policy-aware conversation:

- detects emotions from the user's message,
- classifies intent and predicts chatbot actions,
- and seamlessly transitions between open-domain and closed-domain environments in multi-turn dialogues.

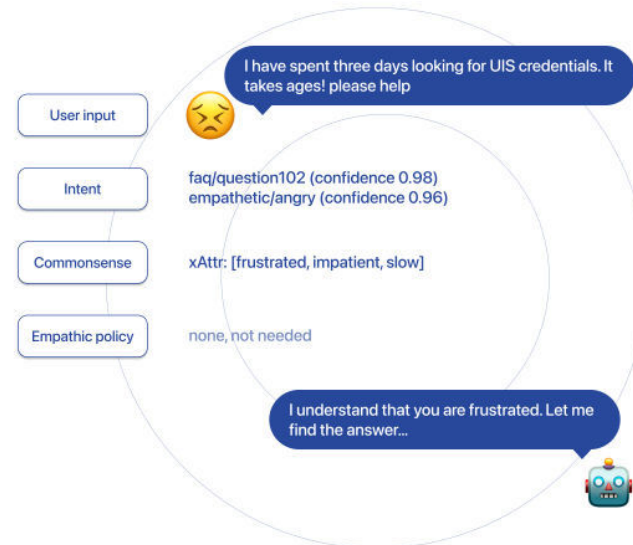
3 MODELS AND DATASETS

This work is implemented in RASA, which is a popular open-source tool for creating conversation agents. The described emotion-aware response generation, commonsense knowledge, and strategy-aware conversation modeling are being implemented as separate custom components in the RASA architecture. The NLU training in this work is hence influenced by various components.

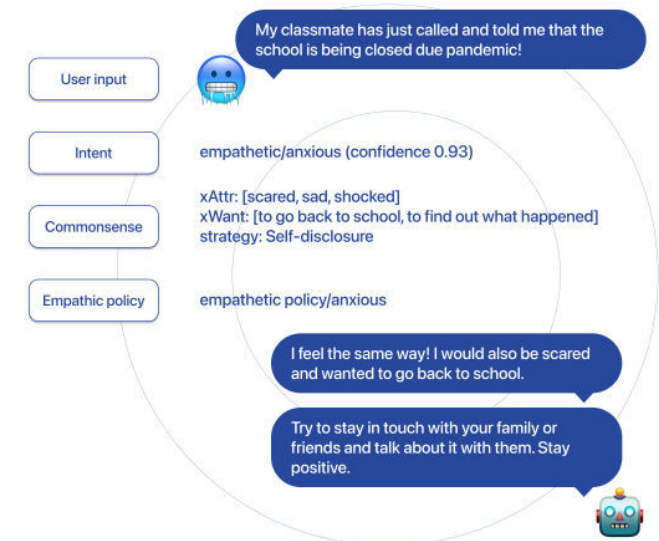
4 RESULT

The proposed agent system is heterogeneous, encompassing predefined responses for the FAQ domain, response templates with placeholders for commonsense input in the open-domain space, and entirely generated responses for pure open-domain dialogue (specific to a particular strategy). The agent has two primary approaches for generating responses: rule-based/closed-domain and generation-based/open-domain systems.

4.1 EMPATHY IN CLOSED-DOMAIN



4.2 EMPATHY IN OPEN-DOMAIN



5 EVALUATION

Through a comprehensive analysis of multiple relevant corpora, configuring language models, implementing open-domain capabilities in RASA, researching and adapting effective strategies for agent response generation, the agent achieved an intent classification accuracy of 0.98. Furthermore, it achieved a perfect accuracy of 1.00 in predicting conversation scenarios in response to unexpected user inputs.