Exploring an Embodied Conversation Agent to Act as an Empathetic Doctor for use in Telehealth

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Introduction

- Online doctor services such as telehealth have become increasingly popular since the Covid-19 pandemic.
- Embodied Conversational Agents (ECAs) are conversation agents, such as chatbots, which use nonverbal cues while communicating.
- Using ECAs in telehealth would allow patients to talk about private issues and ask questions without feeling embarrassed. The doctor's time would also be saved, allowing them to help more patients.
- The fact that the ECA's are embodied also allows them to express empathy and care, which would be crucial for patients that might be scared.
- Our research analyzes the differences that an AI being embodied makes on how people perceive it, as well as it's potential use in telehealth.

Methodology

A.   Embodying an AI
- A GPT AI assistant was told to act as an empathetic doctor that cared deeply for their patients.
- Misty II, a small robot created by Misty robotics, was used for the AI to speak and express emotions through.
- The sentences that misty spoke were ran through a bidirectional LSTM-based sentiment analysis model to detect the emotion present
- Before each sentence, an emotional reaction for the emotion present in that sentence was played.
- Misty could express Fear, happiness, sadness, surprise, and no emotion.

Architecture for emotional detection model

Steps for the ECA system
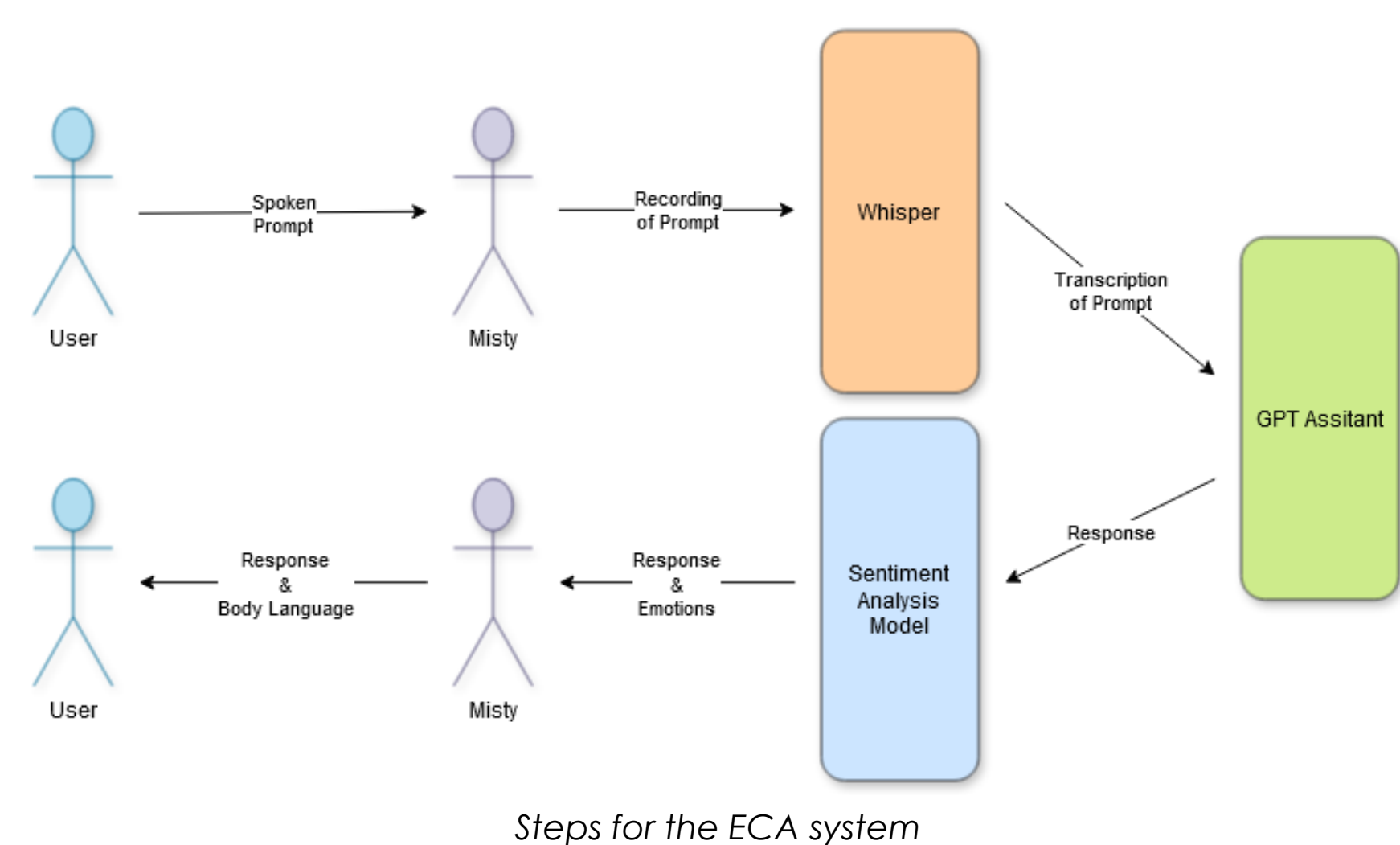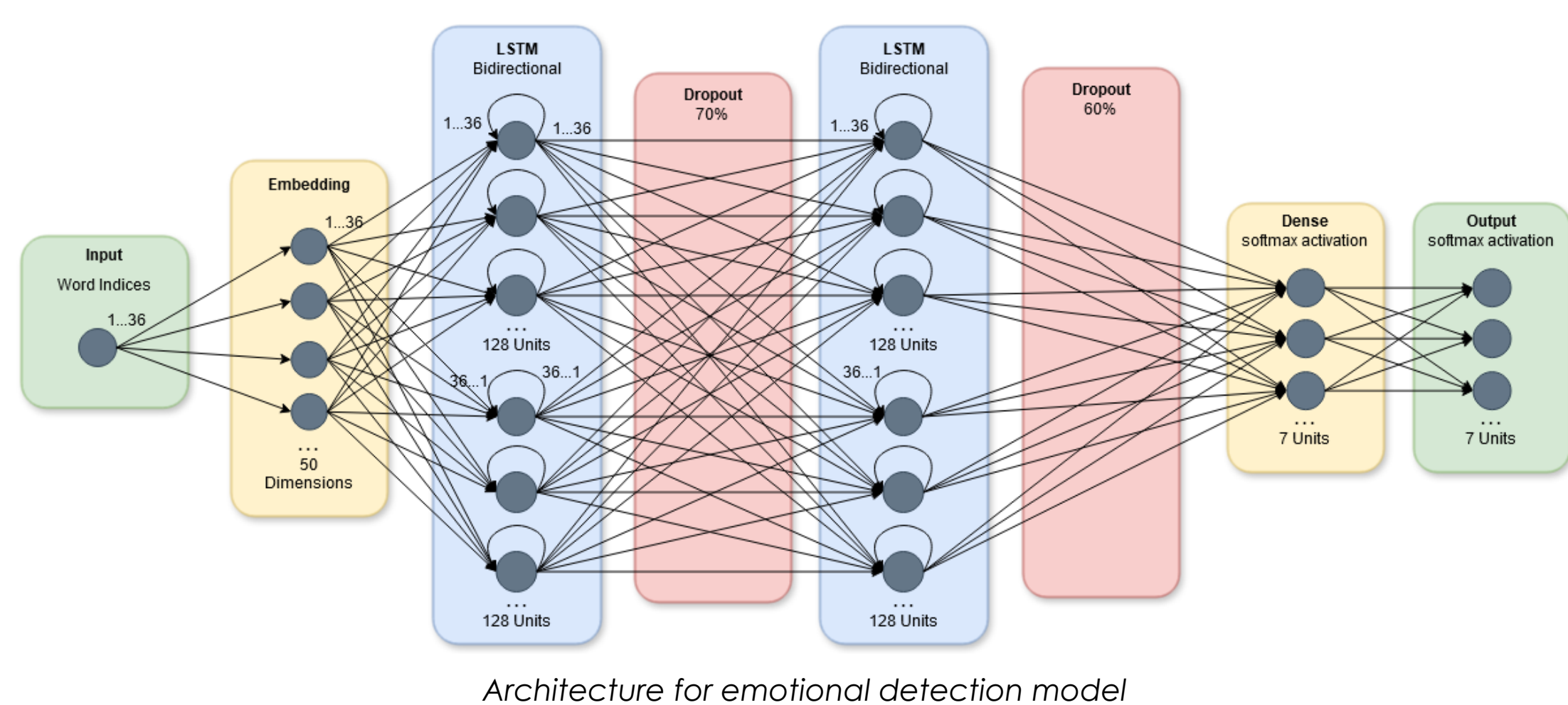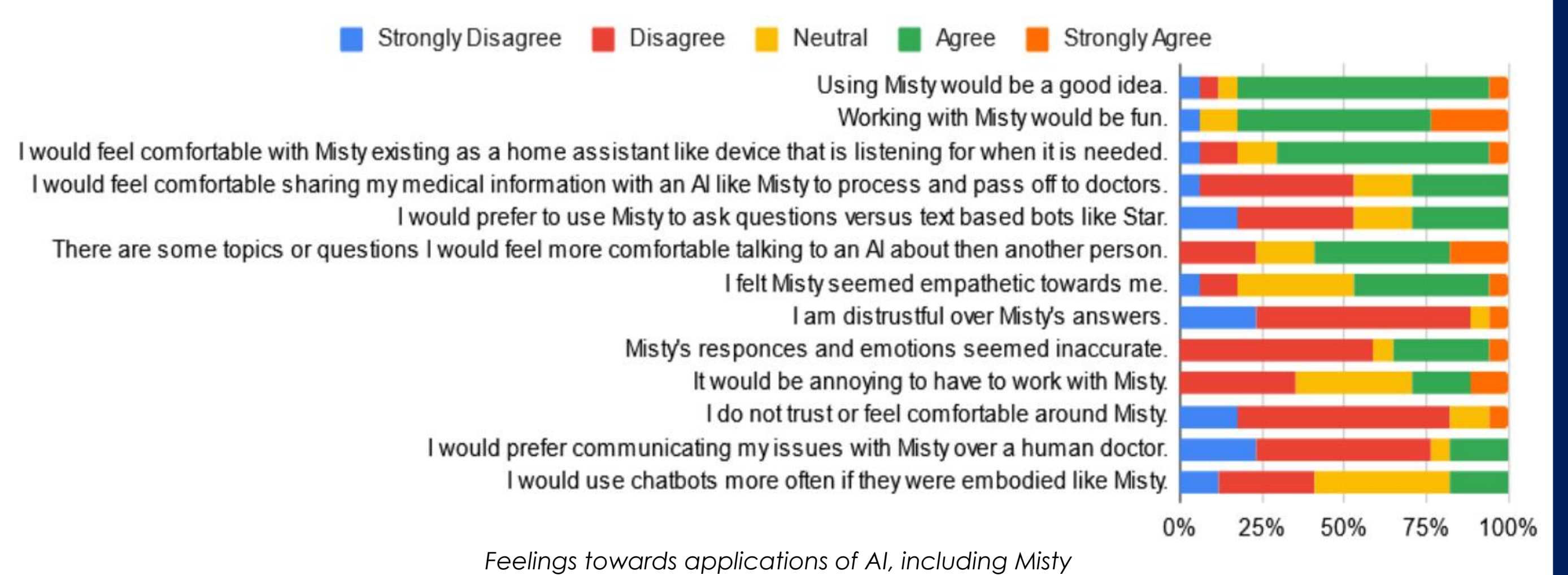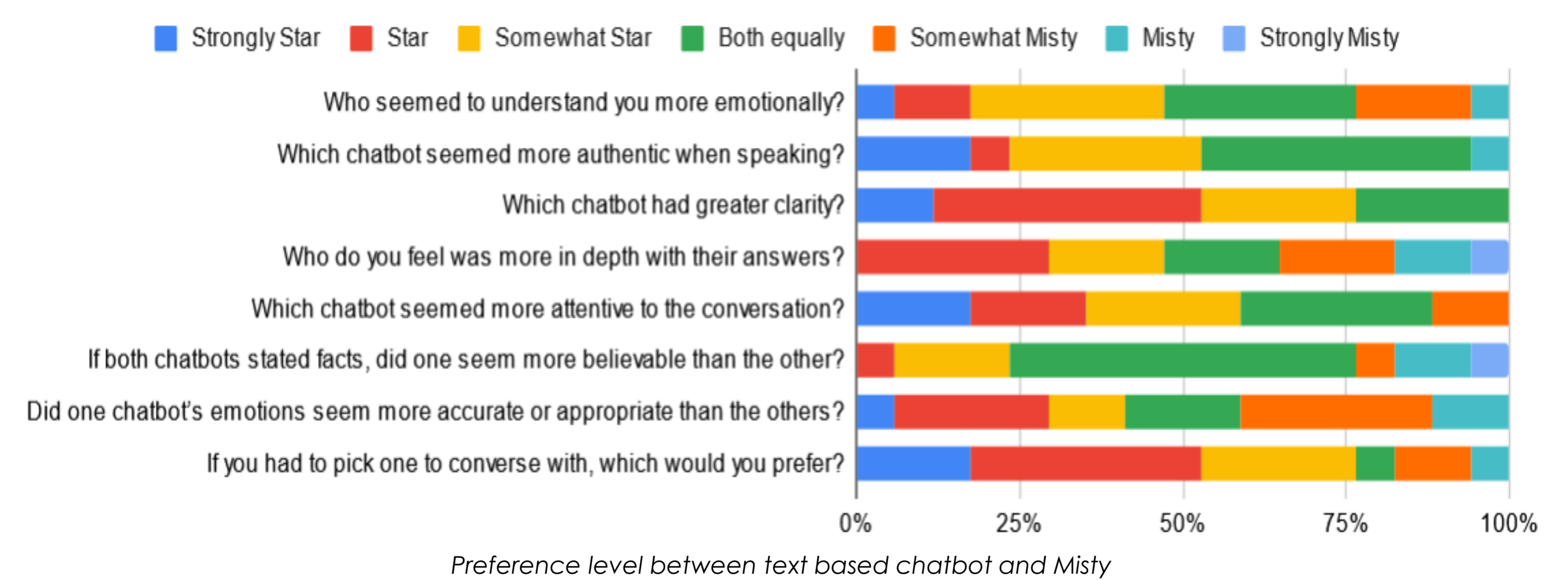
B. Recording Perception
- First users interacted with the GPT assistant in a nonemobodied text-based form, named "Star".
- They then interacted with it through the ECA system, keeping the name of the robot "Misty".
- Users were instructed to imagine they had received a diagnosis of high blood pressure, and to ask the AI any questions they would have.

Results

Misty II

- 76.5% of participants favored the nonemobodied AI "Star", and general preferences leaned similarly.
- When Misty was looked at on its own, people thought favorably of them. 82.4% of participants thought it would be good to use her, and most felt comfortable around her, thinking she was empathetic and trustworthy.
- The issue stems from the ECA system and its limitations.
- Half of the respondents would spend under $600 for Misty, however she is currently being sold for $3,995 by Misty Robotics

Preference level between text based chatbot and Misty

Feelings towards applications of AI, including Misty

Conclusions

- With the ECA enabled AI, participants expected a more human-like interaction. When this wasn't what they experienced, they preferred the non ECA AI, which they had lower expectations for.
- Future research should be directed towards improving the ECA system, meaning decreasing the response time, responses tailored towards verbal communication, as well as more natural emotions.
- Finding cost effective ways to produce an ECA system so it can be accessible.
- Researching into ensuring security of information shared with AIs.