Proposal: How comfortable are people with chatbot?

Farhan Haziq
Colorado State University, Fort Collins, Colorado

1   Introduction

Emotional bonds are an important, often a productive behavior in human society, it is a process of development of a closeness, interpersonal relationship between two or more entities (whether it be human or otherwise). More often than not, emotional bonds don't simply arise from an exchange of facial displays, but often emerge through the dynamic give and take of face-to-face interactions. However, in the early 2010s, we are currently seeing the rise of Artificial Intelligences (AI) that allow us human, to interact with them in the like of voice assistant such as Siri and many others. The idea of having some feeling toward a virtual entities aren't new, it has been part of science fiction trope for ages and with the advancement of AI [1], it is hard not to overstate the depth, breadth, or pace of change in virtual technology that has gone through for the past half-a-centuries and with the rise of AI. This begs a question, as the AI advanced further, can us human, feel more homely and human-y with these virtual entities like how we do with normal human? Can we feel that emotional, affective bonds with a computer? This research will attempt to answer the question by letting a participants interact with a chatbot and gather up their conclusions.

2   Motivation

Emotions are fundamental to human and how we interact, it is a powerful thing that affect how we behave and with the advancement in computing and AI [2], Ich felt that we can leverage on those power of AI as we are relying on computer for our daily life more than ever before. Especially in our current situation, we work with computer day-in-day-out, the computer in today context can be considered to us, as our co-workers and sometime our partner for joy and entertainment. I also feel that this will benefit some people, people who are really lonely, or people who are not really pleasant to be around but they need that interaction feeling [1]. It's quite interesting to see how this pan out in the psychological side of thing as this is literal a "human-computer interaction".

3   Background

The AI has come a long way, while it will not replace an actual human being anytime soon, it has been quite a progress in the recent years, especially in the past 5-10 years with the advancement in machine learning (ML) and AI, allowing the existence of Generative Pre-Training (GPT) model developed by OpenAI (a company specializing in AI) which now in its 3rd iteration (GPT-3), it allow for a human-like reaction and behaviour which allow us to conduct this experiment, other company like Google and Meta (nee Facebook) has also been the driving force in the world of AI.

Currently, at its current stage in its mainstream uses, it is sophisticated enough to replace some portion of customer services with a chatbot and making it convincing enough for the user to assume that they are talking to a human and in turn, reducing the need for labour. Other has developed a bot that will conduct a therapy with a patient. While this is distantly related to what we doing, it shows where the technology is at its current position [3].

Due to most of this technology being an open-source technology, it's easy for us to develop those chatbot and it allow us to simplify the development process and jump into the actual research itself.

4   Plan

This research will be conducted primarily through the use of primary resources. Primary research will be conducted through the information gathered from the participants, for this,

The plan here is to first developed a chatbot that fit our needs, for this we will need two chatbot, one is a very primitive and simple chatbot without "emotion" and another one will be based on GPT-3 chatbot, this is the most humanlike chatbot out there. These were chosen as they are the easiest to make and implement, the chatbot will also be feed with some dataset to allow it to "learn" beforehand and ensure we are not introducing any oddity, the chatbot will then be interface to a chat software so that the user can interact with it easily, this will be the part of Checkpoint 1, to ensure that we have a working chatbot for the participant to communicate with. This will allow us to have a chatbot ready as soon as possible.

Then, participants are needed to conduct this experiment, about 12 participants needed, this then will be conducted online and offline (or whichever condition permitted) and will be divided between three group of four, the participant will not be told on what bot are they using to make sure they don't have any pre-judgement, as a control, I would also be answering those question and pretend to be a "chatbot". After that, they will then take some time to "chat" with the bot for several minutes (10-15 minutes) and this conversation will be monitored in order to control the situation, the conversation is recorded in chat histories which then will allowed us to see the content that has been inputted. As such, we will also then have a consent form to make sure they are aware they are being recorded.

After the chatting session is done, they will then have to answer a questionnaire on what they think of those, the questionnaire question is to be determined but generally speaking, it will be on what they feel and what they think about those. All the data would then be compiled and presented on the presentation day.

Ideally, the bot should at least be ready before Checkpoint 1 and some experiment process should at least be going on by Checkpoint 2. By Checkpoint 3 the data should be ready to be put together and wrapping those up.

5   Describe the technology you will use

The bot would be written in mostly in Python and Rust as it have good support for writing bot and also the aforementioned GPT-3 by OpenAI [4] alongside the primitive simple chatbot, this is so that we can compared the two and allow us to measure the "feels".

6   Deliverables.

The chatbot which someone may use for their next experiment, and the paper.

7   Future Works

Affective computing is an emerging field, while AI certainly would not replace actual human anytime soon, this research would give us an insight into the future of communication and this will be able to enhance our understanding and gauge where we at now. With the data I collected in this experiment, it is hope that it can be used to improve this field even further.

References

[1]   M. Czerwinski, J. Hernandez and D. McDuff, "BUILDING AN AI THAT FEELS,"
        IEEE Spectrum, 30 April 2021. [Online]. Available:
        https://spectrum.ieee.org/building-an-ai-that-feels.

[2]   K. Mayu and S. Loughnan, "Virtual relationships: Anthropomorphism in the digital
        age," *Social and Personality Psychology Compass,* vol. 15, no. 6, p. e12603, 2021.

[3]   T. Numata, H. Sato, Y. Asa, T. Koike, K. Miyata, E. Nakagawa, M. Sumiya and
        N. Sadato, "Achieving affective human–virtual agent communication by enabling
        virtual agents to imitate positive expressions," *Scientific Reports,* vol. 10, no. 1, p.
        5977, 2020.

[4]   OpenAI , "OpenAI API," [Online]. Available: https://openai.com/api/. [Accessed
        10 February 2022].

[5]   D. McDuff and M. Czerwinski, "Designing Emotionally Sentient Agents,"
        Communications of the ACM, vol. 61, no. 12, pp. 74-83, 2018.