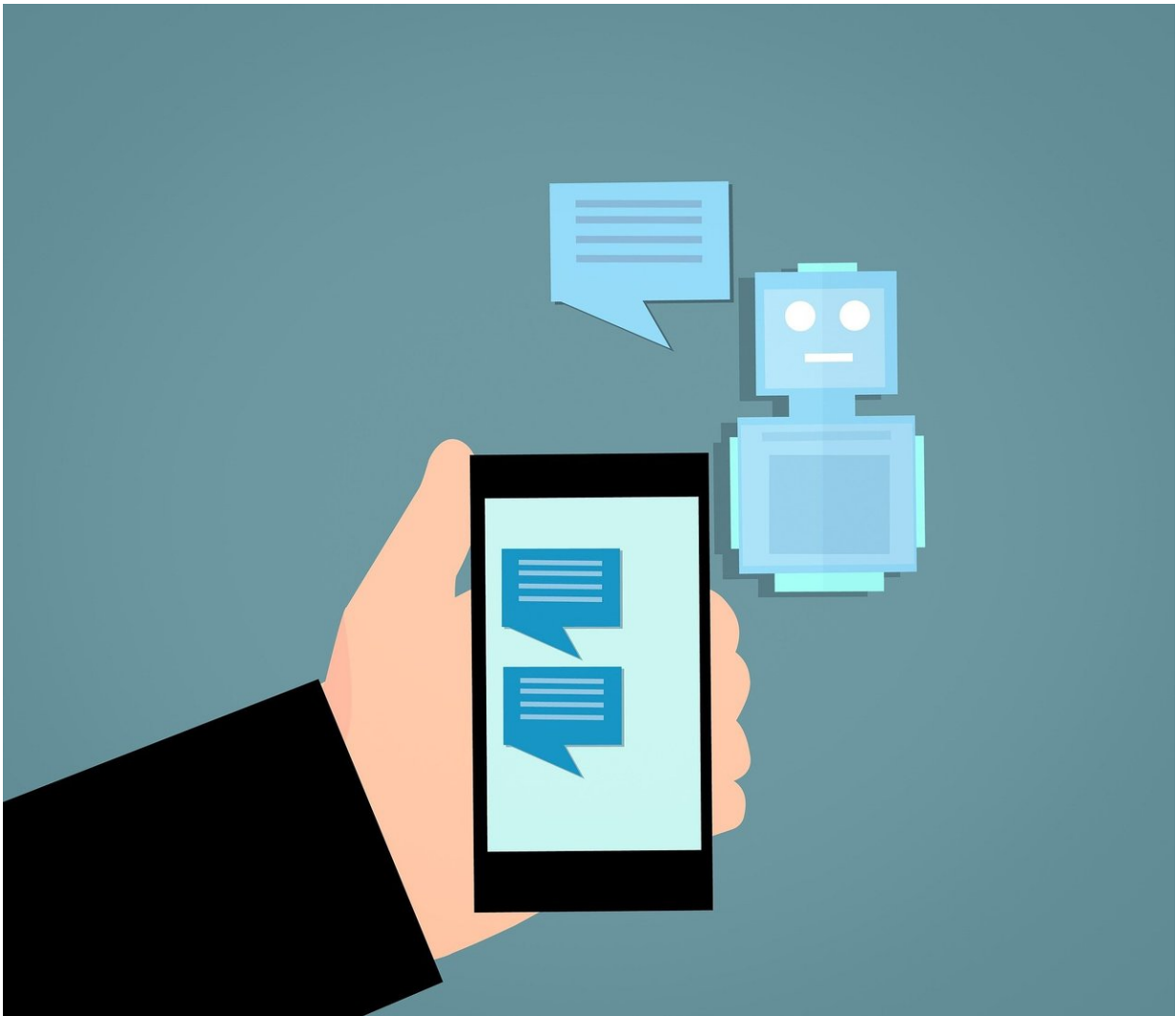# How chatbots could train our mental condition

September 14 2021

Credit: CC0 Public Domain

Technology will play an increasingly social and even emotional role in our lives. Minha Lee—digital designer, information scientist, philosopher and world citizen—is fascinated by this fact. The assistant professor develops chatbots that can help people create a more positive self-image.

In her thesis, Minha Lee writes about a Japanese man who married the popular (animated) pop star Hatsune Miku, who as a hologram was giving sold-out concerts, including in the United States. This virtual relationship gave the emotionally damaged man, after years of self-isolation, the courage to open himself up to society. This is a recent—and pretty extreme—example of the emotional impact that technology can have, but anyone who was young in the 1990s may themselves have once cared for a Tamagotchi—and will therefore understand that people can easily become attached to anything that appeals in some way to our social nature.

Mirror

Our relationship with technology reveals much about who we are as moral beings, says Lee. "In this respect, technology can serve as a sort of moral mirror." In her thesis she approaches this subject from various angles, as befits someone with her varied background. "I am Korean, but I spent some of my childhood living in Eastern Europe and as a teenager I lived in the United States, where I later studied both philosophy and digital animation."

After having spent a while working in Korea, she decided to return to Europe. She opted for the Netherlands, where she took an master's in Information Science at the University of Amsterdam. After working as a data analyst and a marketer, she had the opportunity to take up a Ph.D. position at TU/e, at the research group Human-Technology Interaction "As soon as I realized I would be supervised by experts in various

fields—psychology and philosophy and artificial intelligence—I knew that this was something for me."

Troubled

Her work is partly quite philosophical in its approach, but also contains a number of concrete experiments. Like the one with the 'moral' chatbot Vincent (named after the troubled soul Vincent van Gogh). For a two-week period, 67 test persons chatted daily for a number of minutes with this artificial conversation partner via Facebook Messenger. They reported their findings via a questionnaire about their well-being, which they filled in both beforehand and afterwards. The participants did not have any specific mental problems; the group was a broad cross-section of the population.

Lee and her colleagues constructed two versions of Vincent: one who mostly asked about the mood and state of mind of its interlocutor and another that did just the opposite and shared its own problems. "It turned out that the Vincent in need of a helping hand, unlike the care-providing chatbot, had a positive effect on the way in which the test subjects viewed themselves. Being concerned about a chatbot encouraged them to treat themselves more compassionately and they were less hard on themselves. They realized that they were not the only ones with problems. And so it seems that this psychological mechanism works even when you are typing answers to a chatbot."

Gratitude

These results left a taste for more. That is why Lee, who is now working as an associate professor in the Future Everyday group (TU/e department Industrial Design), developed a new moral chatbot. With this, she is investigating whether chatbots can give people a stronger

sense of gratitude. Lee proceeded in the same way as in her earlier research, with the proviso that the experiment now lasted three days.

Lee says that "the study is now being reviewed, but we have established that a 'gratitude chatbot' also contributes to increasing the well-being of the participants. The funny thing is that the participants indicated that they were talking to a chatbot, but it did help them to feel gratitude. So these are not chatbots that replace human interaction, but rather mediate the contact between people by asking questions like: who would you like to thank and why? Actually, sometimes we just need a reminder."

For the chatbot to work properly, it is important that the virtual partner asks the right follow-up questions. The conversations are therefore 'labelled', so that it becomes increasingly clear whether a person's state of mind during the chat is positive, negative or neutral. After all, a lot of data is needed to train the algorithm to flawlessly sense and respond to the feelings of the chat user.

Data

Lee says that "the big tech companies invest a great deal in their intelligent bots, like the well-known Siri produced by Apple and Amazon's Alexa. They achieve this intelligence by programming the bots with huge quantities of data, so that they can converse on any subject. But for the quality of the experience as rated by the human being involved in the conversation, it is more important that the chatbot has its own identity and the conversation has a logical start and finish. It is all about storytelling, as my training as a digital animator taught me."

Unfortunately, not everyone has someone close by to care for. Perhaps digital technology can serve as some kind of alternative, Lee thinks. "A chatbot on your telephone is, in any case, cheap, user-friendly and always available. I am keen to study whether interaction with a voice, an

animation, or even a real robot, works even better. It would be nice if we could not only help people with mental problems, but also prevent people from getting mental problems. It is strange that we train our physical condition, for example by doing sports, but not our mental condition, isn't it?"

Provided by Eindhoven University of Technology