

Agentphobia and Emotional Labor: How Human-Agent Interaction Contributes to the Preservation of our Humanity

Hirota Osawa¹

¹Information and Systems, University of Tsukuba

Abstract: The idea of human-agent interaction (HAI) has been expanding into several new fields of application. HAI technologies have the potential to replace the emotional labor of people and free them from the regulation of emotion. However, there are many who are afraid of using autonomous agents as an interface. In this paper, I categorize this fear of agents as "agentphobia" and reference several studies while discussing various approaches to overcoming agentphobia.

1 Introduction: Fear of Agent Approach

Human-agent interaction (HAI) has become an important component in the field of human-computer interaction (HCI) [1], [2]. Virtual agents and social robots behave with other social actors as if they have their own thoughts and emotions, just like humans, and trigger users' social responses by their behaviors. They also solve tasks without the cognitive barriers inherent in humans. The use of HAI is becoming more widespread, ranging from the field of entertainment [3] [4] to medical purposes such as the treatment of dementia and autism [5], [6].

HAI methods are especially useful in more socially oriented fields such as education, care work, and entertainment. Hochschild defined the tasks involved in this type of work as "emotional labor" and separates them from physical labor and brain work [7]. In emotional labor, human workers are forced to control their emotions during working time. HAI and related technologies have the potential to act as substitutes for this type of work and free humans from emotional restrictions.

However, replacing emotional labor with HAI technology has caused some people to become suspicious and even fearful. Users might feel afraid of autonomous agents for several reasons. For example, the famous artificial program Eliza and its script DOCTOR, created by Weizenbaum, produced simplified parrot talk and fooled users into believing the program was a real counselor. This simple program is an early example of HAI and a great example of HAI application. However,

this sort of approach was later criticized by Weizenbaum himself [8].

In this paper, I call the human inclination to avoid agents and related approaches "agentphobia" and discuss the reasons behind agentphobia with reference to several studies and then discuss what kind of HAI studies are required in the future.

2 Analysis of Agentphobia

2.1 Fear of the replacement of humans

If we create machines that can work just the same as we can, we lose our role. This is one of the biggest reasons our society avoids reality-world autonomous agent—that is, robots. This kind of fear is a widespread theme in literature, especially in science fiction. A more realistic fear involves the replacement of human work and subsequent loss of human jobs. The word "robot" itself comes from the Czech word for "labor" [9]. However, the fear of replacement tends to relate not only to jobs but to entire human behavior [10].

The famous sci-fi writer Isaac Asimov called the human fear of being replaced by autonomous robots the "Frankenstein complex" [11]. For using robots as a gimmick in novels, he proposed making laws for robots to restrict their autonomy and thereby decrease fear on behalf of the readers. His "Three Laws of Robotics" become a famous policy not only in the literary field but also in the robotics and other engineering fields.

However, these laws were not enough to fully solve the

Frankenstein complex, especially in the social sphere. Asimov's works described the possibility that emotional risk is unpredictable and that the laws are not working. Human have traditionally felt confidence and pride in their own abilities, but this anthropocentric attitude has changed along with the development of technologies. The next subsection discusses how our pride has changed and how much of it we still have left.

2.2 Transition of pride: Definition of humanity

Before the Industrial Revolution, the production of items was human work. Nowadays, most products are produced with the help of robots. Physical labor is no more defined as a work including humanity. For example, our society is supported by many autonomous technologies, including robots and computers. These autonomous robots have replaced many human functions, and this has created conflict. However, these replacements are not the primary drive behind our Frankenstein complex.

In contrast, brain work has been increasingly defined as human-like work in later ages. The fear that this work too might be replaced was manifested in the defeat of top human chess player Garry Kasparov by the computer program Deep Blue. However, humans have defined this kind of brain work as based on computer programs and logic and therefore inherently not "humanlike." Humans preserve their pride by believing that logical works are no longer tasks that are required by humanity.

These examples show that people protect their pride in humanity by redefining humanity if their ability is threatened by autonomous machines. As a result, the last sanctuary for insisting upon their uniqueness lies in their emotional behavior. However, this belief is now being threatened by the growing interest in and potential future reliance on human-agent interaction.

2.3 Utilization of Emotion: The last sanctuary

Several studies have argued that the human psychological process is not a mystery and that it can be regulated technologically. In the engineering field, emotional work is not considered difficult work. Rosalind noted in *Affective Computing* that much emotional communication is reproducible in engineering [12]. *Pervasive Computing* notes how computer systems can persuade humans by affecting the cognitive channels

of users [4].

Human-agent interaction studies have revealed the factors on which our dignity is based. There are two primary types of fear. First, HAI shows the possibility that our social behaviors are simpler than our thoughts. Second, our social behaviors are dividable. The engineering aspects in HAI conflict with this problem because HAI focus on implementing separated cognitive factors in artificial systems. Artificial subtle expressions, proposed by Komatsu et al. [13], and social existence, proposed by Yamaji et al. [14], show that our behavior can be imitated by simplifying rules and that people can sympathize with these simplified behaviors.

3 Beyond agentphobia: How HAI can free our minds

Fear of autonomous agents in the physical labor and brain-work forces is diminishing due to the strong advantages that autonomous technologies offer. These advantages force us to accept technologies while sacrificing our pride. Several mathematicians have discussed the feasibility of including machines in mathematics, but most researchers are not afraid to use computing power for solving problems. So, what kind of advantages are brought by HAI technology that overcome our fear?

The main area to which HAI technology can be applied is emotional labor. Early HAI studies on virtual agents and human-robot interaction have been applied to education, care, mental healing, and entertainment. These fields overlap the emotional labor definition proposed by Hochschild [7], who felt that emotional labor is required when physical labor and brain work is generalized and businesses require specialized advantages that set them apart from other companies. The labor regulates the emotional state of workers, which can result in mental issues for the workers. HAI technologies can be used to solve such problems [15][16]. The emotional behavior of agents will decrease the stress levels of doctors, teachers, and all workers who are forced to control their emotions.

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