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The Human Perspective in Interactions with Social Robots. Analysis and Measurement of People's Attitudes Toward Social Robots

Summary

This dissertation aimed to deepen our understanding of human perspectives in interactions with social robots—specifically, the attitudes people adopt toward them. It achieved this goal—on three levels: by providing a detailed review of research on human attitudes toward robots and the factors that influence these attitudes; by analyzing manifestations of attitudes toward social robots based on natural language material; and by quantitatively measuring attitudes toward social robots, including the analysis and testing of tools designed to study these attitudes.

The first two chapters provide a better understanding of the concept of a "social robot" (including an original definition of the term) and the role of these robots in society. I report, among other things, the results of a study on how Poles (N=31) understand the terms "robot" and "social robot." The findings indicate a strong familiarity with the term "robot," in contrast to "social robot," which still seems reserved for researchers and professionals. I also systematize the concept of attitudes toward robots, conduct an extensive review of methods used in human-robot interaction research (including their advantages and disadvantages), and summarize the findings of these studies. Additionally, I provide a detailed compilation of factors related to attitudes toward robots as identified in the literature. This compilation serves as a useful starting point for designing future research on this topic.

In the third chapter, I present the results of analyses based on an original Corpus of Speech About Robots (COSAR). The corpus contains data on 16 real-world social robots, comprising 90 files and 29,365 comments (including 5,762 identified attitudes toward robots and 632 references to science fiction). The COSAR analysis reveals a picture of attitudes toward these 16 social robots. I address a range of research questions regarding the structure of attitudes toward these robots, the emotional tone of language used to describe them, and the psychological and behavioral attributes assigned to them. I also introduce a classification of these robots based on the structure of the attitudes expressed toward them. This classification provides a convenient foundation for selecting stimuli for studies on attitudes toward robots. Additionally, I analyze references to science fiction works, confirming the fundamental importance of such references in research on attitudes toward robots.

The study described in Chapter Four systematically tests the distinction between social and practical attitudes toward robots. For this study, I adapted three essential questionnaires into Polish: GAToRS, HRIES, and SFHS. I also conducted validation studies on these adaptations (N=203), which confirmed their good psychometric properties. The stimuli for the main study (videos featuring the robots Atlas and Aibo) were selected based on COSAR analysis. They were further tested in a pilot study (N=32), which confirmed the assumed properties of the selected stimuli.

The main study (N=318) followed a pretest-posttest-retest design with three conditions: positive (with a stimulus featuring the robot Aibo), negative (Atlas), and control (without a video stimulus). Differences in general attitudes toward robots, measured before and after exposure to a specific robot representation, which was intended to represent social and practical attitudes, did not emerge. However, it was observed that Aibo and Atlas elicited attitudes of different valence in participants. The results suggest that the distinction between social and practical attitudes may be purely theoretical or may pertain to a phenomenon not captured in this study. Other factors related to attitudes toward robots may have influenced the interpretation of the results. Among the variables examined, inspired by the literature review in Chapter Two, those found to be significantly associated with or differentiating attitudes toward robots included beliefs in human uniqueness, anthropocentric views, interest and engagement in science fiction, frequency of science fiction consumption, place of residence size, and perceived robot autonomy. These identified variables indicate that attitudes toward robots may be deeply rooted in individuals' broader value systems and worldviews. On the other hand, they may also be influenced by environmental and individual differences. The results may also confirm the existence of a general construct of attitudes toward robots and the relative stability of these attitudes. These findings raise new questions about the nature of general attitudes toward robots, their impact on behavior toward technology, and the adequacy of questionnaires used to measure these attitudes.