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AUTHOR Marjut Johansson

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## **Human–robot interaction (HRI)**

**Marjut Johansson, University of Turku, Finland**

*Human–robot interaction (HRI)* involves the ways in which people interact with robots, the kinds of behavior they exhibit with robots, and their attitudes toward robots (see Dautenhahn, 2007). This interdisciplinary field studies topics from robot design and developing robotic functions to specific uses of robots as companions or assistants to elderly people. *Child–robot interaction (CRI)* is a subfield that examines the ways in which children interact with robots. Its focus in education has been on STEM-related approaches (science, technology, engineering, and mathematics) to teaching programming and robotics, but at present is expanding to other fields as well. One specific case is the use of social robots in tutoring, teaching and learning tasks to different target groups (Belpaeme et al. 2018).

According to basic definitions, social robots are at least semi-autonomous in their communication and follow “social norms” in their interactions with humans (see, e.g., Brezeal, 2003). Social robots’ functionalities, such as speech recognition and visual and hearing sensors, allow them to observe their interlocutors’ sounds and movements. However, the programming of pre-scripted dialogues or a reliance on artificial intelligence can limit the robot’s participation in these interactions. Conversations require that robots be able to maintain joint and coordinated interactions with their interlocutors. These interactions are asymmetrical in the sense that humans must enact the meaning of the conversation. Despite interactional limitations, participants tend to consider robots as both social agents and technical objects (Alač, 2016; Peura & Johansson, 2023).

Social robots offer a new kind of interactive digital tool for teaching, assisting, and learning, enhancing positively cognitive and affective learning outcomes (Belpaeme et al., 2018). Ethical issues, such as digital privacy and data protection, should be addressed in educational contexts and in other social institutions where social robots are used for educational purposes.

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