



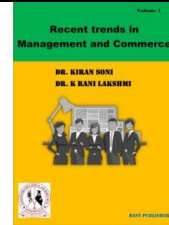
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# A survey on Perception Methods for Human Robot Interaction

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### Abstract

Socialize and collaborate with people Everyday Life activities require Robots to Express human beings' "intelligence". Proper measurements in direct, face-to-face scenarios we will introduce the set, behavioral analysis of human partners. We summarize these robots and highlight key findings and key linkages with existing long-term studies. Artificial Emotional Intelligence (AEI) Human-Robot Identify Movements in Interactions (HRI). To provide robots with expressive capabilities Focuses on simulation and enhancing natural emotions. Robotics in America and Japan Observation of participants with researchers. Based on the data collected through interviews, this article is about the social impacts and robotics of scientists on acceptability Analyzing discourses. Reciprocal design And the architecture of co-production, robotics, and dynamic interactions between communities Explores, society, and technology Social as an alternative perspective on dynamics A for imagining and evaluating robots Also proposed as a framework. Social robotics researches the body in a socially interactive way and robots that can provide cognitive support focus on growth. Social robots User characteristics (age, gender, education, Some studies on the importance of robot familiarity, mood) previously explored.

**Keywords:** Social robots, Human-robot interaction, Collaboration with robots, Cyber security

### Introduction

Human-robot interaction (HRI) is “for human use Analysis, design, modelling of robots, Implementation and Evaluation” related multidisciplinary Department. How users interact with robots A study has been completed on taking, and Over the past decade, a single user (or group of users) The first long-term interaction with the robot multiple times Studies began to appear. [2]. Robots have little Place, time or observation requirements. Their sensors are simulated environments Be able to respond to changes (movements, sounds...). Communication with the patient. They are patients Can be monitored or used in therapy. Other potential benefits of therapy include robotics, There are no known adverse effects and Employees do not need special training, and they You can repeat the script as many times as you want.[7]. An important branch of robotics is social robotics. Recently computer vision, artificial intelligence and It has attracted much attention in many fields such as mechatronics and emerged as an interdisciplinary effort. Many social Although robots have been created, that of a social robot The formal definition is unclear and varied Practitioners have defined it from different perspectives.[8]. In robotics, artificial emotional intelligence (AEI) is the ability of a robot to recognize and understand human emotions through artificial methods and technologies. Naturally exhibits various emotional features that facilitate interactions with humans. [16]. A technology-centric approach to robotics is also supported. On the surface this may seem plausible, but on closer inspection, we must question the impact of suppressing the mutual interaction between humans and robots, which is valued as a value in a just society.[38]. User experience is essential for a product to be successful Significantly important, too Extracting this information from users is a trivial task Not. Very important for measuring user experience Some factors such as psychosocial behaviors are completely Not considered, and product use continues to be studied is not done. Also, rather than real-time procedures Techniques like questionnaires and interviews Researchers prefer, 84% of studies Using questionnaires and 16% surveys They use interviews to evaluate user experience.[21].

### Social robots

Social robots in autism therapy have been used successfully. On social robots People have high expectations. In a socio-emotional way Social robots for interacting with people Designed, and a robot people Use the same type of nonverbal cues When communicating using, people subconsciously understand and make social judgments and Researchers have found that responding This Robots do more when people use hints. Social robots can also operate autonomously. [5]. At this point, several strengths and threats to the development of social educational robotics must be considered. This initiative is about how caring social robots can be Be clear with the question to behave Related, but different. It's human-robot deals with fundamental questions of communication and When we interact socially with robots what will happen. Social robots, political theory and Drawing on the literature on ethics, social Policy on use of robots in maintenance I provide a basis for building.[13] Social Robots (SRs) with children and adults Successful in outpatient and academic settings are used. Engagement and stress They can be useful tools for reduction. Social Robots (SRs) for the medically ill Children's emotional needs and those needs between the human capital needed to fulfill They hold the promise of addressing the current

economies of scale gap. [14]. Social robots can be compared to assisted animals, which exhibit social behavior during interactions. (1) Robots are very similar in form and behavior are customizable, (2) therapists and Parents can control the robot instantly or (if needed) can be stopped. ease, and (3) assistance Much more than what is needed to train animals Robots can be produced at low cost.[18] Human beings And a to successfully communicate with other robots The system requires some motor and sensory skills.[20]. Social robots in household, manufacturing, healthcare and education In various application domains like are used. Human-in design of robots Consider robotic interactions and their utility One could argue that it also increases security. Another purpose of functional robotics is social the use of robots for commercial applications. Accordingly, Tonkin et al. Flying a social robot Human-robot to be implemented in experimental mode at the station correlation (HRI) method.[21] Social assistance Although robots can provide better results, Individuals actually use them, sure A robot of a certain size to do Acceptance is required. Acceptance is defined as a positive evaluation of a robot, Action is ultimately taken as a result of applying technical intent. Technology Acceptance Model (TAM) of adoption Key influencers are technology users How effective it is in improving performance available and how effortless it is to use (Davis, 1985)[22].

### Human-robot interaction

From a robot's point of view it is relatively easy, Because its actions are generally a governmental machine or determined by some parameter principle. The timing of emotional events that trigger a behavior trivial. Instead, the RGB-D data stream from the human Retrieving events that describe behaviors is tricky. Ease between periods of activity and inactivity A possible way to discriminate is that of joint pathways In the sliding window, analyze the time spectrum It is to plot the power of such calculated signals.[1]. In addition, exploring avenues such as co-creation of human-robot interaction or codestroy to ensure these robotic technological developments are fully transformative. Proliferation of social robots in services, co-creation The need to identify ways Creates, co-destructs, symbiotic human-robot The value of interaction, the value creation of social robots and how service users can co-destruct capability For research that determines what they value is similar. in services.[6]. Robot to human-robot interaction Not only follows the gaze of the human companion, but Human motivation should also be followed. Effectively To be, the robot is first some kind of social intelligence To engage in the behavior – with a human partner or With other persons - trust in its agency to increase and thereby increase the following view of the human observer [23]. It is social-cognitive mechanisms such as mental health Not only is an important approach to dealing with, but also social Robotics research and overall human-robot Human cognitive mechanisms in the context of communication It is also a general recommendation for scaling.[34] Various robots in service encounters in hotels are already used, and in hotel environments More complex involving human-robot interactions Using social robots for tasks Researchers have investigated. The future with robots Research needs more attention. Human-robot Human-robot related hotel service interaction research It is believed to be one of the most important aspects in communication research [37]. Communication atmosphere. On Applications of Emotion Space in HRI Research is flourishing. In terms of emotional space Some representation of emotion recognition and synthesis This leads us to add an overview of approaches Stimulates. Also the concept of communication atmosphere We introduce, this is the emotion of individuals has space. Another use of emotional space Communication status. Their interesting In a contribution, Rutkowski et al. An atmosphere Describes as a psychological factor and feeling, which Behavior can affect the process and in a place May result. HRI is a multi-human-robot interaction As inclusive, Rutkowski et al. Emotional connection By analyzing the situation, the robot By understanding the emotional state of the interlocutor, Realizing the overall communication situation, then Appropriate response and emotional feedback (calm, encouragement and praise etc.) can be provided. Research on communication atmosphere to date Although ongoing, only a few such efforts are numerous Based on human interaction situations have involving a few people During communication, people are individual Attention to situational communication from emotion This may be due to non-payment. Requirements for understanding communication Accreditation is fulfilling. Atmosphere; communication The atmosphere is vague and uncertain, which is easy to feel Helps, but difficult to define and evaluate. At the same time, in real-time HRI, the communication situation changes.[16]. and the narrowing of emotional gaps We have presented, computational models of emotions Introduction about and their advantages and disadvantages are discussed. In terms of applications, emotion We recorded progress in processing To summarize, we introduced the concept of communicative environment.

### Collaboration with robots

Methods of interacting with robots It is practical to design and then test them Circumstances matter. Also, in hotel service Also consider how humans and robots collaborate should be taken because the instruments contribute to them Depends on how it's used. Various With robots in a hotel with robots The study examined collaboration. The first of the collaboration Form robots instead of human labor uses.[37] Socially expressive robots Physical with humans in various situations in the future Likely to share places and help. On a daily basis, people [1] They are positive about collaborating with robots Not only do they have attitudes, but they And that they support a companion robot in their home As previous work shows. [2]. So social robots are increasingly in the consumer market No surprise to enter. Most robots on the consumer market have eyes Designed with some similar facial features and Enables visual communication and eye contact.[44] Also, humans and robots in hotel service The mode of cooperation should also be considered because The contribution of tools is how they are used Depends on that. So, working with robots Design methods and apply them in practical situations Testing is important.[37]

### The mutual shaping of technology and society

Technically determined as described above Linear narratives, technology of robots A casual of social robotics with a focus on construction Although not interfering with procedures, to the lab To activate robots in the outside world The dynamic between society and technology Interactions need to be deeply understood. In the future Keeping in mind that technology can benefit society That's our research. So if society doesn't agree There is no reason to develop technology. Currently Society does not interact with the situation. with engineers, So there is no harm in social robots Design social and technical issues Social robotics researchers that cause agree; Certain researchers will come Depending on the field, for social robot design They are technical or social approach Can recommend. [30]. Design of social robots "Robot Sociability Issues" and "Robot Technology "Problems" after dividing; of robots in society Security issues arising from the use of "legal machinery can be solved by creating "Language". Long term Along with exposure, some people want sociability for their Roombas Reasons have begun to show that they are unique Calling by names and their appearances They customize. Roomba is more common Being a home robot used, 2.5 With more than a million units sold, its Longitudinal studies of the use of technology and Very powerful for the mutual shaping of society Examples can be given. Cyber security: The field of robotics is a fast-paced technology There is an amazing state of progress, as well Barriers to entry have fallen significantly over time are coming Social robots are increasingly affordable and Universities and are becoming common Not only in industry but also in homes. Currently, twenty Robots for homes and other social environments are marketed. A lot in this growing field Although there are researches, the internet of these robots There is a dearth of research on safety. Social Owners of bots are system or cyber security Because it is not necessary to be experts, for the root They are about changing the default password I wonder if they ever think about it There is is questionable. [42].Previous A new, without authorization specified in the section Add user, grant root privileges and SSH A program that implements access via the robot can operate.

### Conclusion

In this article, lack of recognition in today's market for how a social robot can be compromised we describe a case study. For sharing robots a wireless network connection is required. of the present study By analyzing the basic mechanisms of mentalization A new way of doing things, robots As a result of the design of appearances and behaviors Acceptability and comfort factors We also provide a method to explore. A brief, critical review of usability research we have provided. Social robots in early language education. Human needs that cannot be met by robots alone the study suggests that teachers are fulfilling. Social supporting the unique advantages of robots Lack of resources is a challenge for researchers should be viewed as an opportunity. This article is about this Intermediary among experts on important topic we hope to encourage cooperation.

### Reference

1. Anzalone, Salvatore M., Sofiane Boucenna, Serena Ivaldi, and Mohamed Chetouani. "Evaluating the engagement with social robots." *International Journal of Social Robotics* 7, no. 4 (2015): 465-478.
2. Leite, Iolanda, Carlos Martinho, and Ana Paiva. "Social robots for long-term interaction: a survey." *International Journal of Social Robotics* 5, no. 2 (2013): 291-308.
3. Čaić, Martina, Dominik Mahr, and Gaby Oderkerken-Schröder. "Value of social robots in services: Social cognition perspective." *Journal of Services Marketing* (2019).
4. Valentí Soler, Meritxell, Luis Agüera-Ortiz, Javier Olazarán Rodríguez, Carolina Mendoza Rebolledo, Almudena Pérez Muñoz, Irene Rodríguez Pérez, Emma Osa Ruiz et al. "Social robots in advanced dementia." *Frontiers in aging neuroscience* 7 (2015): 133.
5. Yan, Haibin, Marcelo H. Ang, and Aun Neow Poo. "A survey on perception methods for human–robot interaction in social robots." *International Journal of Social Robotics* 6, no. 1 (2014): 85-119.
6. Yan, Haibin, Marcelo H. Ang, and Aun Neow Poo. "A survey on perception methods for human–robot interaction in social robots." *International Journal of Social Robotics* 6, no. 1 (2014): 85-119.
7. Johal, Wafa. "Research trends in social robots for learning." *Current Robotics Reports* 1, no. 3 (2020): 75-83.
8. Brščić, Dražen, Hiroyuki Kidokoro, Yoshitaka Suehiro, and Takayuki Kanda. "Escaping from children's abuse of social robots." In *Proceedings of the tenth annual acm/ieee international conference on human-robot interaction*, pp. 59-66. 2015.
9. Gockley, Rachel, Jodi Forlizzi, and Reid Simmons. "Natural person-following behavior for social robots." In *Proceedings of the ACM/IEEE international conference on Human-robot interaction*, pp. 17-24. 2007.
10. Yan, Fei, Abdullah M. Iliyasu, and Kaoru Hirota. "Emotion space modelling for social robots." *Engineering Applications of Artificial Intelligence* 100 (2021): 104178.
11. Wolbring, Gregor, and Sophya Yumakulov. "Social robots: views of staff of a disability service organization." *International journal of social robotics* 6, no. 3 (2014): 457-468.
12. Kim, Elizabeth S., Lauren D. Berkovits, Emily P. Bernier, Dan Leyzberg, Frederick Shic, Rhea Paul, and Brian Scassellati. "Social robots as embedded reinforcers of social behavior in children with autism." *Journal of autism and developmental disorders* 43, no. 5 (2013): 1038-1049.

13. Kanero, Junko, Vasfiye Geçkin, Cansu Oranç, Ezgi Mamus, Aylin C. Küntay, and Tilbe Göksun. "Social robots for early language learning: Current evidence and future directions." *Child Development Perspectives* 12, no. 3 (2018): 146-151.
14. Alač, Morana. "Moving android: On social robots and body-in-interaction." *Social Studies of Science* 39, no. 4 (2009): 491-528.
15. Shourmasti, Elaheh Shahmir, Ricardo Colomo-Palacios, Harald Holone, and Selina Demi. "User experience in social robots." *Sensors* 21, no. 15 (2021): 5052.
16. Bishop, Laura, Anouk van Maris, Sanja Dogramadzi, and Nancy Zook. "Social robots: The influence of human and robot characteristics on acceptance." *Paladyn, Journal of Behavioral Robotics* 10, no. 1 (2019): 346-358.
17. Šabanović, Selma. "Robots in society, society in robots." *International Journal of Social Robotics* 2, no. 4 (2010): 439-450.
18. Miller, Justin, Andrew B. Williams, and Debbie Perouli. "A case study on the cybersecurity of social robots." In *Companion of the 2018 ACM/IEEE International Conference on Human-Robot Interaction*, pp. 195-196. 2018.
19. Baillie, Lynne, Cynthia Breazeal, Pete Denman, Mary Ellen Foster, Kerstin Fischer, and Jessica R. Cauchard. "The challenges of working on social robots that collaborate with people." In *Extended abstracts of the 2019 CHI conference on human factors in computing systems*, pp. 1-7. 2019.
20. Miklósi, Ádám, and Márta Gácsi. "On the utilization of social animals as a model for social robotics." *Frontiers in psychology* 3 (2012): 75.
21. de Graaf, Maartje MA, Somaya Ben Allouch, and Jan AGM van Dijk. "Long-term evaluation of a social robot in real homes." *Interaction studies* 17, no. 3 (2016): 462-491.
22. van Wynsberghe, Aimee. "Social robots and the risks to reciprocity." *AI & SOCIETY* 37, no. 2 (2022): 479-485.
23. Nakanishi, Junya, Itaru Kuramoto, Jun Baba, Kohei Ogawa, Yuichiro Yoshikawa, and Hiroshi Ishiguro. "Continuous Hospitality with Social Robots at a hotel." *SN Applied Sciences* 2, no. 3 (2020): 1-13.
24. Westlund, Jacqueline M. Kory, Hae Won Park, Randi Williams, and Cynthia Breazeal. "Measuring young children's long-term relationships with social robots." In *Proceedings of the 17th ACM conference on interaction design and children*, pp. 207-218. 2018.
25. Michalowski, Marek P., Selma Sabanovic, and Reid Simmons. "A spatial model of engagement for a social robot." In *9th IEEE International Workshop on Advanced Motion Control, 2006.*, pp. 762-767. IEEE, 2006.
26. Wykowska, Agnieszka. "Social robots to test flexibility of human social cognition." *International Journal of Social Robotics* 12, no. 6 (2020): 1203-1211.
27. Malle, Bertram F., and Matthias Scheutz. "Moral competence in social robots." In *Machine ethics and robot ethics*, pp. 225-230. Routledge, 2020.
28. Rodogno, Raffaele. "Social robots, fiction, and sentimentality." *Ethics and information technology* 18, no. 4 (2016): 257-268.
29. Lim, Velvetina, Maki Rooksby, and Emily S. Cross. "Social robots on a global stage: establishing a role for culture during human-robot interaction." *International Journal of Social Robotics* 13, no. 6 (2021): 1307-1333.
30. González-González, Carina Soledad, Verónica Violant-Holz, and Rosa Maria Gil-Iranzo. "Social robots in hospitals: a systematic review." *Applied Sciences* 11, no. 13 (2021): 5976.
31. Meltzoff, Andrew N., Rechele Brooks, Aaron P. Shon, and Rajesh PN Rao. "'Social' robots are psychological agents for infants: A test of gaze following." *Neural networks* 23, no. 8-9 (2010): 966-972.
32. Kwon, Minae, Malte F. Jung, and Ross A. Knepper. "Human expectations of social robots." In *2016 11th ACM/IEEE International Conference on Human-Robot Interaction (HRI)*, pp. 463-464. IEEE, 2016.