Benefits and Risks of AI Companions

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Motivation

- **AI companion** — AI-equipped agent, chatbot, or robot serving as a personal companion to a human through meaningful interaction
- AI companions are emerging in various fields and applications, ranging from **therapeutic** to **casual**
- Robots are becoming **teammates** rather than tools
- **Feasible** through natural language processing technology (advances in deep neural networks, namely transformers)
- Collaboration in mixed teams of humans and robots brings focus on **social aspects**
- Human in the loop → **adaptive AI, continuous learning**
- Dealing with uncertainty by **asking whenever unsure**

Benefits

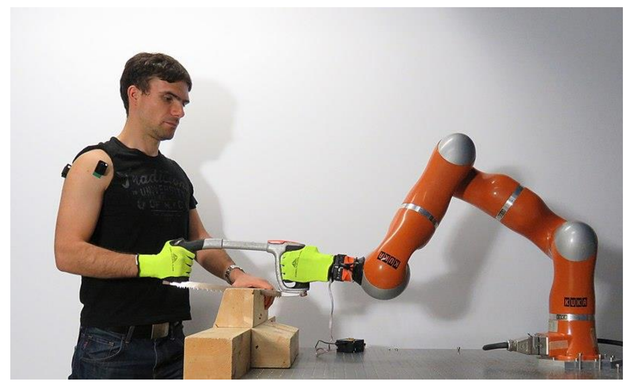
- Always **available**, patient, inexhaustible, and tireless; (ideally) reliable
- **Adaptation** and behavior adjustment based on the specific needs of each user
- User model learning and real-time model updating, **emotional analysis** to choose a suitable approach
- Learning from only **few examples** through interaction
- **Positive social impact**: mental health and well-being applications, dealing with loneliness
- **Artificial empathy** in social robotics
- People tend to be more **honest** (open up) to a machine, bypassing the fear of failing and being judged

Risks

- **Misuse** of the personal information coming from the interaction
- Risk of causing **injuries** in case of embodied AI systems
- Adverse effects such as adopting **undesired behavioral patterns**, causing negative emotions, addiction
- **Mental health** implications, high sensitivity of the user in difficult moments of life, dealing with controversial topics
- Risk of **social isolation**, preferring the interaction with AI companions to the interaction with humans
- **Wrong decisions** of the AI system may have severe consequences

Research Questions

1) How does the embodiment and **appearance** of the AI companion influence the acceptance by the user?
2) How to customize the behavior and **adapt** to the needs of each individual user?
3) In which way should the companion's verbal and nonverbal **communication** be designed to fit the situation?
4) To make themselves trustworthy and transparent, how can AI companions **explain** their reasoning?
5) What are the ways to deal with **uncertainty** of the AI systems?
6) How can AI **support decision-making** without rendering human knowledge and skills obsolete?
7) Which information about the user, the task, and the environment should be sensed and which should be inferred to diminish **privacy** concerns of the user?
8) What are the techniques to foster the **personal development** of humans instead of reducing their involvement and learning to rely blindly on their AI companions?
9) In which way can AI companions overcome **human cognitive biases** in decision making?
10) What are the implications of **pretending to be a human** teammate in contrast to disclosing openly the AI nature of the companion?
11) Who decides what **ethical behavior** is?
12) How to ensure the **security** of the data collected by the AI companion?
13) Who is **responsible** for the decisions of the AI system?



References

- Seeber, Isabella, et al. "Machines as Teammates: A Research Agenda on AI in Team Collaboration." *Information & Management* 57.2 (2020): 103174.
- Gkinko, Lorentsa, and Amany Elbanna. "The Appropriation of Conversational AI in the Workplace: A Taxonomy of AI Chatbot Users." *International Journal of Information Management* (2022): 102568.
- Mukherjee, Debasmita, et al. "A Survey of Robot Learning Strategies for Human-Robot Collaboration in Industrial Settings." *Robotics and Computer-Integrated Manufacturing* 73 (2022): 102231.
- Fiske, Amelia, Peter Henningsen, and Alena Buyx. "Your Robot Therapist Will See You Now: Ethical Implications of Embodied Artificial Intelligence in Psychiatry, Psychology, and Psychotherapy." *Journal of Medical Internet Research* 21.5 (2019): e13216.

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