DeloitteStiftung

Initiative D21

# DIGITAL FUTURE CHALLENGE

DFC #6 – HRI-EU Use Case

# Honda Research Institute Europe GmbH

USP Honda Research Institute Europe: We innovate through science and envision intelligent systems to work among us, for us and with us in the future.

Employees: 70

Industry: Research

## Thematic focus of the use case

Robotics

# TITLE OF THE USE CASE

Communicating with robots – but how?

# SHORT DESCRIPTION

Communicating with robots is challenging on a technical, ethical and emotional level – for us and for the robots themselves. How can communication with robots and AI be designed today to meet expectations and individual preferences in the future?

# #HASHTAGS

#HumanMachineInteraction #RobotCommunication #TrustInAI

INNOVATE THROUGH SCIENCE

# DESCRIPTION OF THE ORGANISATION

Founded in 2003, Honda Research Institute Europe is a wholly owned subsidiary of Honda R&D Co., Ltd.

In coordination with our sister institutes in Japan and the USA, our research activities, in line with our company slogan "Innovate through Science", focus on the following areas:

- Knowledge and Cognition
- Learning and personalisation
- Optimisation and Creativity
- System and Behaviour

The issues addressed range from mobility and human-machine interactions in robotics to engineering and energy management.

The institute focuses on researching and developing new learning, prediction, optimisation and representation concepts for the Honda Group and society as a whole.

# VISION OF THE ORGANISATION

One focus of the Honda Research Institute EU is **cooperative intelligence**. Cooperative intelligence is the ability to make optimal use of limited resources to achieve a goal in complex environments together with others. While artificial intelligence aims to automate intelligent functions, cooperative intelligence focuses on user trust and human interaction with intelligent systems. The aim here is not to replace users with intelligent automation, but to optimally involve them in the joint processing of the task.

Our work aims to explore cooperative intelligence in order to enable society to develop a trusting relationship with intelligent systems that...

- expand and maintain our abilities,
- enable the sharing of experiences,
- allow us to optimally contribute our abilities in interaction with intelligent systems,
- and encourage trusting interactions in future AI-human scenarios.

# PROBLEM SETTING

**Communicating with robots – but how?**

Imagine this: in a few years' time, robots will be a natural part of our everyday lives – delivering medicines to hospitals, helping out in supermarkets or supporting elderly people at home. For this collaboration to succeed, we need to be able to communicate with them. But this is where the real technical challenges begin.

Communication sounds simple – but it isn't. Computers have a limited understanding of our language. When several people talk at the same time, systems quickly become confused: they don't know who to listen to. Delays caused by speech recognition also lead to stilted dialogue – the robot responds too late, we continue talking at the same time and, in the end, everyone talks at cross-purposes. In addition, different cultural backgrounds and interindividual characteristics place important demands on the robotic system. What appears friendly in one society may seem rude or even threatening in another.

One possible approach lies in the special characteristic of robots as "embodied AI". They have bodies, can move, make gestures, and communicate with light signals or glances. This allows them to show who they are listening to or signal non-verbally: "Wait a moment, I'm still thinking."

Communication does not have to be limited to language – body language, symbols and movement can also help to make dialogue more fluid and reduce uncertainty.

# QUESTION AND TASK

But this is where another challenge arises: how human-like can an artificial system be? Our own communication system is extremely sophisticated – and seems an attractive model for robotics. But when robots appear too similar to us, we tend to attribute empathy or responsibility to them that they do not actually possess. A friendly face or a warm voice can quickly raise expectations that cannot be met technically. This blurs the boundaries between social interaction and technical function – with the result that emotional connections arise that may be ethically questionable.

So the question is: how can we design communication systems so that robots interact with us reliably and ethically? How can misunderstandings be avoided while keeping the conversation natural? How can cultural and individual communication preferences be taken into account?

And further: What combination of language, body language and other signals makes robot communication understandable, pleasant and robust – without creating false expectations? Do we perhaps even need a whole new "robot language" that is intuitively understandable and at the same time clearly signals: "I am not a person, but a technical support!"?

How could a future embodied AI prototype or, more generally, a concept reflect these needs or specific, individual challenges arising from them?

# ADDITIONAL BONUS QUESTION

How can trust be established without losing sight of the boundary between social interaction and technical function?

# ADDITIONAL

For example, existing guidelines, previous efforts and strategies for responsible AI, digital ethics or digital responsibility.

https://www.honda-ri.de/

https://www.honda-ri.de/research/machine-ethics/