

CoBot Studio - Research for harmonious teamwork between humans and robots

The LIT Robopsychology Lab of JKU Linz starts an Austrian research platform with the Ars Electronica Futurelab

(Linz, 30.08.2019) When humans and robots work side by side, it isn't always easy: How to communicate with a colleague who only consists of a gripper arm? How do you create a safe working relationship, even if humans and machines work physically closely together - and how can robots be more easily accepted in everyday work?

The nationwide CoBot Studio research project of the LIT Robopsychology Lab at the Johannes Kepler University of Linz, which is being implemented in cooperation with the Ars Electronica Futurelab and five other project partners, is concerned with this very issue. The aim is to create a unique mixed reality environment in which future forms of collaboration with CoBots, i.e. collaborative robots, can already be simulated today. Diverse disciplines, ranging from robotics to psychology and virtual reality to non-verbal communication, will be involved.

Lighter, safer, closer: CoBots

Unlike conventional industrial robots, which for safety reasons are usually only used behind barriers or in cages, CoBots are light and safe enough to work physically close to people. However, this increasingly raises questions about mutual understanding: How can we tell which object a robot will grip next? How does the machine communicate that it is waiting for input? And can a person estimate in which direction the robot arm will move?

This is why CoBot Studio wants to investigate which robot signals in which working environments for which group of people actually contribute to (mutual) understanding, trust and, ultimately, to successful collaboration.

Deep Space 8K as the playground of the future

To this end, Deep Space 8K at the Ars Electronica Center will play an important role: Here, the new mixed-reality simulation environment is set to take shape. "Since the beginning, we have used Deep Space 8K as an experimental environment for scientific and artistic research and have created a completely new infrastructure to this end," explains Roland Haring, Co-Director at the Ars Electronica Futurelab. "We are very happy to have the chance, within the frame of the CoBot Project, to improve Deep Space 8K with regards to the depiction and collection of data in VR-interaction-experiments between humans and machines". A real robot, human test subjects and a common virtual environment in which tasks are to be performed - this is the vision with which the comprehensibility of robot signals in various collaboration scenarios is to be investigated.

With queries, please contact

Christopher Sonnleitner
Tel: +43.732.7272-38
christopher.sonnleitner@ars.electronica.art
ars.electronica.art/press

"With CoBot Studio, we are creating a unique, flexibly adaptable research environment for human-robot communication at the workplace of the future," says Martina Mara, project manager and Professor of Robopsychology at Johannes Kepler University Linz. "We feel all too easily dominated by autonomous machines. Our research results should contribute to making collaborative robots humane and to making teamwork with them pleasant, efficient and safe".

Know-how from Psychology, Robotics, Game Design and more

The project is funded by the Austrian Research Promotion Agency FFG within the framework of the innovative program "Ideas Lab 4.0", which focuses on the support of experimental approaches and interdisciplinary cooperation. With the LIT Robopsychology Lab of the JKU Linz, the Ars Electronica Futurelab, Joanneum Robotics, the Austrian Research Institute for Artificial Intelligence, the Center for Human-Computer Interaction of the University of Salzburg as well as the companies Blue Danube Robotics and Polycular, the project team unites expertise in psychology, robotics, computer science, multimodal communication, game design, virtual & augmented reality, sociology and safety, all in the spirit of the "Ideas Lab 4.0" from all over Austria.

As a best-practice project, the CoBot Studio should also underline the relevance of interdisciplinary partnerships for the design of human-centered technology and working environments of the future.

Full Title: CoBot Studio – Crossing Realities for Mutual Understanding in Human-Robot Teams

Contact:

Univ.-Prof.in Mag.a Dr.in Martina Mara

LIT Robopsychology Lab

Johannes Kepler Universität Linz

Phone: +43 732 2468 9511

Mail: martina.mara@jku.at

LIT Robopsychology Lab

Open Innovation Center

Johannes Kepler Universität Linz

Altenberger Str. 69

With queries, please contact

Christopher Sonnleitner
Tel: +43.732.7272-38
christopher.sonnleitner@ars.electronica.art
ars.electronica.art/press

4040 Linz, Austria








Roland Haring, DI (FH)

Co-Director, Ars Electronica Futurelab

Phone: +43-732-7272-883

Mobile: +43-664-812-6166

Mail: roland.haring@ars.electronica.art

Ars Electronica        [s.electronica.art/futurelab](https://www.ars.electronica.art/futurelab)
LIT Robopsyc [w.jku.at/lit-robopsychology-lab/](http://www.jku.at/lit-robopsychology-lab/)

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Tel: +43.732.7272-38
christopher.sonnleitner@ars.electronica.art
ars.electronica.art/press