USE – Robots everywhere

Robots everywhere	
Offered by	Department of Industrial Engineering and Innovation Sciences
Language	English
Primarily interesting for	All students.
Prerequisites	Required courses: - Recommended courses: -
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Content and composition

American military drones fly above Afghanistan in search of terrorists. At the same moment, a robot with artificial lips plays the trumpet in a beautiful way. And in Europe, researchers are working on the development of humanoid robots that are able to wash the behinds of elderly people. Robots are thus no longer only used in factories, but are rapidly becoming an integral part of our daily lives. Think about human activities such as caring for the elderly and driving cars; but also about having sex and killing people. This new robotics is about literal automatization, from love to war. This is driven by the ultimate engineering dream: developing an autonomous and socially and morally capable machine.

The new robotics will also make things more difficult, because we are forced to think, debate and form an opinion about the many political, ethical, philosophical, judicial and social issues that the rapid developments in the field of robotics raise. Are we able of capturing the innovation opportunities offered by robotics? Have we thought about how to really shape that innovation in a responsible manner? How can we create the conditions for public trust in these new technologies? When can we tell when is the best time to remove the legal barriers that hamper the introduction of beneficial robotic systems. In this USE course sequence we examine the challenge to perceive and anticipate the chances and risks related to the new robotics in a timely way, because in the end we humans have to decide how to shape the automation from love to war.

Course code	Course name	Level classification
0LEUB0	Social Robots	1.
0LSUE0	Rational agents: Robots & Artificial Intelligence	2.
0LAUK0	Project Robots everywhere	3.

Course description

0LEUB0, Social Robots
This course first describes the emergence of the vision that social robots will be broadly deployed in our society. Then we identify some key technical characteristics of social robotics. What kind of machines are robots actually? What kinds of technologies are we discussing when we talk about social robots? Subsequently, we look at some key social characteristics of social robots, and we will discuss the ethical questions in the field of innovation and about social acceptance about robotics on the basis of robo-ethics. Furthermore, we address the technical opportunities and challenges in developing interaction of social robots.

0LSUE0, Rational agents: Robots & Artificial Intelligence

Robots increasingly work in our everyday social environment. This environment cannot be specified in detail beforehand, and changes constantly. Hence robots will autonomously have to construct an interpretation of their environment, as a basis for deciding how to carry out their tasks. In other words, they will have to be able to behave in such a way that would be called 'intelligent' if a human were so behaving. This course introduces students to the area of Artificial Intelligence, where many of the theories, methods and techniques on which the software controlling autonomous robots is based come from.

0LAUK0, Project Robots everywhere

In the Project Robots Everywhere, students working in groups combine scientific/technical knowledge with social scientific knowledge to create a robot design taking into account the USE aspects. An example of such a project is related to RoboEarth, a World Wide Web for robots: a giant network and database repository where robots can share information and learn from each. The goal of RoboEarth is to allow robotic systems to benefit from the experience of other robots, paving the way for rapid advances in machine cognition and behaviour, and for more subtle and sophisticated human-machine interaction. In such a project students think of a matching scenario within the RoboEarth-project which will be represented with real robots.