

Jörn Vogel

Cognitive Robotics, Institute of Robotics and Mechatronics, German Aerospace Center (DLR),
Oberpfaffenhofen-Weßling, Germany

Re-enabling robotics: How people who need assistance in their daily life can make use of robots

For many people with upper limb disabilities, simple activities of daily living, such as drinking, opening a door, or pushing an elevator button require the assistance of a caretaker. Nowadays, assistive technology, like wheelchair mounted robotic manipulators, become more and more available.

However, control of such devices is still an open question, especially in cases, where people cannot operate a mechanical interface like a joystick. Brain-Computer-Interfaces (BCI) can help to overcome this issue. In this talk, I will present our work on assistive robotics. For people with severe disabilities, invasive interfaces, like intracortical electrode arrays, as well as non- invasive interfaces based on the measurement of residual muscular activity can be applied, and allow the user to e.g. drink from a bottle using a robotic manipulator. As the bandwidth of such interfaces is limited, compared to the complexity of the task, shared-autonomy can be used to enhance the usability of the system and simplify interaction with the environment. We are investigating the functionality of our assistive robotic system with users with spinal muscular atrophy. Furthermore, we are currently also exploring how semi-autonomous assistive robotic systems can support in care retirement homes.