Service robotics: towards open standards

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Before 2004

- Service robots existed only in science fiction

- Industry approach: Supplement to human labour

- Uniform safety standard for robots of all loads and tasks in industry
The Fall in 2004

- Attempt from Asia: Standardisation of service robots
- Reluctant attitude from industry
- Additional standardisation branch and differing views on safety of robots, depending on the sector (health, care, public sector, industry)
- The consequence: Service robot cannot be used in industry, and industry robot cannot be used outside the factory halls
Until 2018

- Projects of industry with the target of opening up markets outside the industry
- Uncontrolled growth of the term "robot", the old definitions and normative limits no longer work
- Trend towards compact, versatile assistants instead of massive assembly robots
- Attractiveness of robotics for new players (e.g. research, universities)
New opportunities for robotics

- Science fiction shows what will be possible
- The laws of robotics must be observed!
- Ethical questions are important for further development of robotics
- New application areas outside the cage
- Mobility as key role
- Easier interaction, control and use of robots
  - Gesture control
  - Intuitive teaching
  - Deep learning and artificial intelligence
  - ROS for Programming
ROS: Success factor for service robotics

- Modular design of ROS provides flexible solutions
- Standardisation across manufacturers
- Additional flexibility through programming languages
- Networked, interoperable system in line with Industry 4.0
ROS as essential part of Pilz’s service robotics package
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Motivation

- An EN ISO 10218-1 compliant system with ROS
- Integration of industry relevant motion commands in ROS
- Simple programming via a Python API or the control panel
- Direct access to our industrial components such as motion control systems PMCPPrimo MC or PLCs of Automation System PSS 4000…
Programming of a Dual Arm Robot with ROS
PMCprimo: Evolution of a motion controller into the control module of a service robot
Outlook

- Consideration of safety requirements
- Industrial suitability of ROS components
- Further dissemination of ROS in the private and service sector as well as in the industry sector ?!
- Pilz products based on ROS for service robots suitable for all sectors