Robotics is a fast developing market increasingly exploited in the development of novel and improved services and products in areas as diverse as manufacturing, search and rescue, health, homes, transport and logistics, environment and agriculture.
The University of Bologna is active in the automation and robotics area in many research fields. The activity is spread across many departments, involving electric, electronics, mechanical, system science, biotechnology and psychology areas. The research of the University of Bologna covers a wide range of issues:

- Industrial and Service Robotics (underwater; aerial and agriculture robotics; navigation; guidance and trajectory planning; visual odometry and SLAM; mobile manipulators; robotic hands and grippers)
- Human-robot interaction (collaborative robotics; physical human-robot interaction; cognitive human-robot interaction; variable impedance actuators; motor learning in human-robot interaction; human–robot and human-human social interaction)
- Advanced Control in Mechatronics and Automation (nonlinear control systems; robust state and output feedback; estimation theory; sensorless control of electric drives; power converters for green energy and power quality; chip and system-level thermal control for supercomputers)
- AI and Cognition (3D vision; depth from stereo and monocular depth estimation; embedded computer vision; object detection and recognition, semantic segmentation; deep learning for computer vision and robotic perception; perception and representation of object use; affordances and interaction)
- Mechanical and Sensor Devices (patient-specific robotic prostheses and exoskeletons for medical robotics; cable-driven parallel robots; soft polymeric actuators and sensors; embodiment of robotic and biomechanical prostheses)

**HIGHLIGHTS**

The University of Bologna is member of the euRobotics AISBL, the private side in the contractual Public-Private Partnership SPARC, the partnership for robotics in Europe.

**Center for research on Complex Automated Systems (CASY)** including a big flight room area equipped with the VICON motion capture system for indoor navigation and rapid prototyping and the **Laboratory of Automation and Robotics (LAR)** with equipment for the development of new robotic prototypes, robotic platforms and several robotics anthropomorphic hands and industrial grippers.

**European funded projects coordinated by the University of Bologna**

- **FP7 AIROBOTS** - Innovative aerial service robots for remote inspections by contact (2010-2013)
- **FP7 SHERPA** - Smart collaboration between Humans and ground-aErial Robots for imProving rescuing activities in Alpine environments (2013-2017)