



## European SMEs Robotics Applications

### ESMERA Partner self-description

The **Technical University of Munich (TUM)** has its Competence Centre located at the computer science department in [Garching-Hochbrück campus](#).

The main goals of the TUM Competence Centre is to provide expertise, support and infrastructure to SMEs, to facilitate research-based innovation (especially in the area of cooperative robotics and manufacturing) and knowledge transfer to the SMEs ecosystem.

The TUM Competence Centre (CC) can be used for experimental testing of human-robot interaction and cooperative manufacturing (main area of focus of the centre), for operation of mobile (including aerial) robots, and test of automotive systems.

The TUM CC is constructed and managed by professionals carrying a lot of scientific and technology stimulation experience from the ECHORD++ and HORSE projects. TUM's staff has established contacts with SMEs not only in Germany but throughout the EU. As an illustration, the ECHORD++ project involves 31 experiments and each experiment involves 2-4 SMEs and Universities/Research institutes from the EU. All these partners dedicate their efforts in ECHORD++ to utilising robotics in their respective industries. Apart from European projects, the department has historic collaborations with industries such as Siemens, Audi, BMW, FESTO etc. The department has also deep ties with institutes researching in Industry 4.0, such as FORTISS.

The main part of the infrastructure offered by the TUM CC is a collaborative, human-robot manufacturing environment. The setup consists of

- several robotic arms end-effectors
- mobile robotic platforms
- an experimental setup corresponding to a collaborative manufacturing cell, equipped with a tactile SAPARO floor
- a factory cell mock-up to simulate the environment
- a fully automated car testbed equipped with an augmented reality module that allows its users to control the car in life-like scenarios, testing human responses

#### Services we offer:

- Evaluation of new technologies: experimenting, proof of concept and testing
- Demonstration and experience of robotics in manufacturing
- Technological expertise and consulting

- Assistance to technology transfer in the field of robotics
- Knowledge exchange in workshops about robotics in manufacturing
- Advice on IPR management, ethical, legal and societal issues in robotics