Autonomous Robot and Factory of Future (ARFoF)

Robotics and Embedded Systems
Department of Informatics
Technische Universität München

www6.in.tum.de

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Agenda

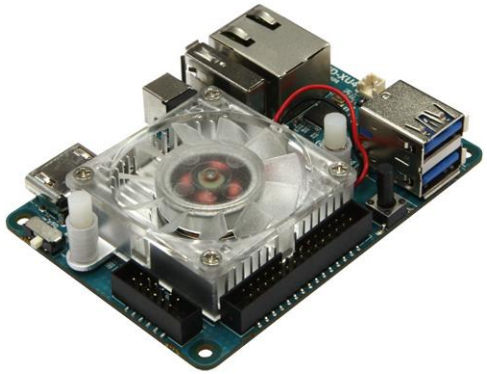
- ❑ The autonomyLab
- ❑ Topics
- ❑ Lab Instructors
- ❑ How to apply for the lab course?

AutonomyLab/Factory of future

- ❑ Humans and robots in fenceless cells
- ❑ Customized (low batch) productions
  - Quick re-configuration
- ❑ IoT for communication
- ❑ Safety is of paramount importance
  - Multiple risk detection mechanism
    - Sensors: Cameras, depth sensors
  - Reliable communication between IoT nodes

Topics

Topic - I



- Wireless sensor network for the detection of the risk scenarios
  - Image processing on board computer
  - RGB and depth data available
  - Detection of Risky scenario, e.g. Human approaching to a moving robot or a restricted area
  - Transmission of the scene perception data to the central unit (FactoryFloor manager)

Topic - 2

- Central FactoryFloor Manager
  - Reception of information from multiple camera nodes
    - Only scene information (no video)
  - Fuse the scene information to intelligently analyze advance risky scenarios
    - Certain risks could only be analyzed by fusing information from multiple sensors
  - Take necessary steps to avert the risk
    - Instruct the robot to stop, issue the necessary emergency warning to the robot,

Topic - 3

- Intelligent robot
  - Is able to follow the assigned trajectory
  - Do local sensor fusion to avoid collision
    - By stopping or slightly deviating from the assigned trajectory
  - Follow the instruction from the FF manager

Lab instructors

- Francesco Maurelli
  - http://www6.in.tum.de/Main/Maurelli
- Daniel Renjewski
  - http://www6.in.tum.de/Main/Renjewsk
- Hardik Shah
  - http://www6.in.tum.de/Main/Shah

How to apply for the lab course

- ❑ Through matching system
- ❑ Write a motivation letter to the organizers
  - Your background
  - Your preferred topic