

Machine vision in robotics (3 credits)

This training is a part of EU-funded “Kohti osaavaa Satakuntaa” –project. Kohti osaavaa Satakuntaa – project is led by Satakunta University of Applied Sciences (SAMK). Machine vision in robotics (3 credits) consists of two main subjects: collaborative robots and machine vision.

- Schedule: (From march 2022, Live lectures in Teams, exercises and video lectures on Moodle, laboratory exercises in RoboAI laboratory at SAMK campus Pori)
 - 15.3. 13.00-16.00 Live start
 - 21.3. Basics of industrial robots, video lecture + exercises
 - 24.3. Machine vision camera technologies + optics, video lecture + exercises
 - 28.3. Collaborative robots, video lecture + exercises
 - 31.3. Lighting in machine vision, video lecture + exercises
 - 4.4. Service robotics + mobile robotics, video lecture + exercises
 - 7.4. 3D machine vision, video lecture + exercises
 - 11.4. Grippers and sensors in robotics, video lecture + exercises
 - 13.4. Analysis tools in smart camera environment, video lecture + exercises
 - 20.4. 13.00-16.00 Robot programming in ABB RobotStudio simulation environment, Live lecture
 - 25.4. 13.00-16.00 Smart camera analytics programming in Cognex InSight environment, Live lecture
 - 28.4. Safety of robot applications, video lecture + exercises
 - 2.5. Integrating machine vision and robotics, video lecture + exercises
 - 6.5. 12.00-16.00 Laboratory exercises at SAMK campus Pori (Half of the participants in robotics exercises and half in machine vision exercises)
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 - 20.5. Online exam in Moodle

- Trainers: Janika Tommiska (robotics, collaborative robotics) and Mirka Leino (machine vision)

- Course content:
 - Basics of industrial robotics
 - Intelligent robotics:
 - collaborative robotics
 - when to use and not to use cobots?
 - mobile robotics
 - service robotics
 - Grippers and sensors in robotics
 - Robot applications in industry
 - Safety of robot applications
 - Robot programming in ABB RobotStudio simulation environment
 - Basics of machine vision
 - Camera technologies
 - Optics
 - Practical solutions for machine vision lighting
 - 3D machine vision
 - Analysis tools in smart camera environment
 - Different machine vision solutions
 - Integrating machine vision and robotics
- Learning outcome
 - In this course, the participant will learn to understand different types of robots, their main features as well as their applications and safety, the basic principles of machine vision, camera technology and optics, the importance of lighting in machine vision systems and different forms of 3D imaging. At the same time, the participant can get acquainted with the programming of robots and machine vision systems in offline environments as well as with real robots and machine vision cameras.
- Learning methods and activities
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