Course content

This course explores visual perception and cutting-edge technologies with a foundation in computer vision, integrating knowledge from machine learning, image processing, robotics, and automation. The course takes a geometric estimation and degrees of freedom perspective to introduce machine perception technologies and their applications in contemporary AI fields.

Topics covered include:

1. Intelligent video surveillance, robotics, and autonomous vehicles.
2. 3D printing and reconstruction techniques.
3. Applications in gaming, film production, and smart medical procedures.
4. Theoretical foundations of geometric estimation and practical system implementations.

Course objectives

Knowledge

1. Understand the fundamental principles, methodologies, and concepts of data visual perception.
2. Gain insights into state-of-the-art applications in AI and their connection to computer vision techniques.

Skills

1. Design and implement visual perception systems through hands-on practices and coursework.
2. Develop expertise in solving real-world problems using advanced visual perception and estimation methods.

Competencies

1. Propose and implement visual perception solutions for intelligent systems.
2. Integrate advanced technologies to address practical challenges in fields like robotics, autonomous driving, and 3D modeling.
3. Build and optimize systems for dynamic applications, such as tracking, reconstruction, and pose estimation.