

Machine vision and image processing



SCHOOL

Polytech Graduate School of Engineering



CAMPUS

Belle-Beille



LEVEL

Engineering 4th year



OPEN TO EXCHANGE STUDENTS

Yes



SEMESTER

Fall (S1)

- > **Degree course:** Graduate School of Engineering - Automation and Computer Engineering
- > **Teaching unit:** UE 7.2 Sciences de l'ingénieur
- > **Course language:** English
- > **Duration (hours):** 24
- > **ECTS:** 2
- > **Teacher(s):** Jean-Baptiste Fasquel

> Assessment:

- Continuous assessment
- Final exam

> Teaching methods:

- | | | | |
|--|----|-------|-------------------------------------|
| <input checked="" type="checkbox"/> Lecture course | 2 | hours | <input type="checkbox"/> Case study |
| <input type="checkbox"/> Tutorial course | | hours | <input type="checkbox"/> Project |
| <input checked="" type="checkbox"/> Practical work | 22 | hours | |

COURSE DESCRIPTION

Architecture of a vision system : sensor, lighting, data transfert, analysis. - - Image structure, video

Basic tools : histogram, linear and non-linear filtering, connected components, object recognition (feature engineering, machine learning)

Tutorial classes : segmentation, denoising, object recognition (shape descriptors, local descriptors, classification)
- - Labs with an industrial camera (collaboration with a firm working in the field on industrial vision and automation)

OBJECTIVES

Knowledge of classical applications encountered in machine vision, including the architecture of machine vision systems (from image acquisition to content exploitation).

PREREQUISITES

Sensors, Algorithms and Programming Fundamentals

SELECTIVE BIBLIOGRAPHY

Digital Image Processing (3rd Edition), R. C. Gonzalez, R. E. Woods, 2007 - Computer and Machine Vision : Theory, Algorithms, Practicalities (4th edition), E.R. Davies, 2012 -