INSTITUT d'OPTIQUE GRADUATE SCHOOL | Continuing Education
Formation Continue

SC19 | Machine vision



LEVEL: BASIC

Audience: Engineers from enterprises or administrations wishing to master the analyse and the design of machine vision systems

Prerequisites:

Pedagogical manager(s): Julien Villemejane - Chargé de cours à l'Institut d'Optique

Language of the training: French

Maximum capacity: 12

Price: 2560€ HT - **Duration:** 6 days - 42 h

Objectives

- Have an overview of the design of a machine vision system
- Know the key parameters associated to this design
- Discover the building blocks of a machine vision systems
- Be able to specify, design and evaluate machine vision systems

Next sessions

- 11 june 2019 au 13 june 2019 et 19 june 2019 au 21 june 2019 - Palaiseau

Addressed topics

Applications of machine vision
Photometry, colorimetry, lighting
Optics
Cameras
Softwares and image processing
Design and dimensionning of a machine vision system

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The program

Photometry, colorimetry, lighting
- Human vision
- Photometry basics
- Surface properties
- Colorimetry

Geometrical and instrumental optics, cameras
- Image formation
- Different types of objectives / classical optical systems
- Instrumental optics
- Aberrations
- MTF
- Ray optics
- Cameras: main types of cameras, key parameters, interfaces

Image processing and softwares
- Preprocessing tools
- Edge detection tools
- Shape recognition tools
- Identification and verification tools
- Other tools: calibration...
- 3D Reconstruction / super-resolution

Design, dimensionning
- Requirements specification
- Material choice: lighting, optics, camera
- Software choice: processing tools
- Case study: matrix (2D) and linear (1D) vision

Labworks
- Photometry
- Lighting
- Bitelecentric optics
- 3D/super-résolution

Methodology and assessment

Lectures and exercices
Interactive experimental demonstrations
Labworks

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