



VISION PAR ORDINATEUR

PROJECT

Lecturers: **Mohsen ARDABILIAN, Alexandre SAIDI, Liming CHEN**

| Lecturers : 16 | TC : 0.0 | PW : 0.0 | Autonomy : 0.0 | Study : 4 | Project : 0.0 | Language : FR

Objectives

Computer vision aims to model and automate the visual recognition process by the machine and has many applications (e.g., industrial inspection, robotic navigation, human-machine interaction, etc.). This course introduces the key concepts and techniques of the field and covers the following topics: image formation and filtering, contour detection and segmentation, local descriptors and their matching, stereovision, movement and structure estimation, detection and recognition of objects.

Keywords : Image Filtering and processing, edge detection and segmentation, local descriptors, motion tracking, stereo vision, object detection and recognition

Programme

- Introduction to Computer Vision
- Reminders on image formation and filtering, contour detection by variational techniques
- Reminders on homogeneous coordinates and geometric transformation
- Projective Geometry
- Segmentation of images and objects
- Local Feature's Descriptors and Matching
- Movement tracking and structure estimation
- Camera Calibration and Stereo Vision
- Object detection and recognition

Learning outcomes

- Understand the process of image formation and stereovision
- To be able to implement fundamental techniques to improve and process images
- Develop vision applications for the detection of simple objects

Independent study

Objectifs : This activity is not concerned with framed autonomy activities outside personal work.

Méthodes : This activity is not concerned with framed autonomy activities outside personal work.

Core texts

D. Forsyth, J. Ponce., *COMPUTER VISION -- A MODERN APPROACH.*, Prentice Hall., 2002
R. Szeliski. *COMPUTER VISION -- ALGORITHMS AND APPLICATIONS*, Springer, 2010
R. Hartley, A. Zisserman. *MULTIPLE VIEW GEOMETRY IN COMPUTER VISION.*, Cambridge University Press, 2004

Assessment

The final test and scores of BE