

IMA4522 Computer vision**Period** : S8 / P3**ECTS** : 4**Language** : English**Organization :**

- Teaching Load / Total Load : 45/90
- Lectures/Exercices/Labs/Final Exam : 33/0/12/0

Assessment

Final grades in this class will be based on lab work reports.
Final mark = Average (Lab works).

Objectives

Master techniques and features used in computer vision, such as visual feature extraction and geometric methods.

Keywords**Prerequisites****Course outline**

- Economical challenges of computer vision
- Geometric and textural feature extraction:
- detection of edges, lines and singular points
- deterministic and statistical filtering
- mathematical morphology
- contour-based variational approaches: active contours, level-set methods.
- 2D geometry: Freeman coding, polygonal approximation, Hough transformation
- 3D geometry:
- projective models and invariants
- stereovision : epipolar geometry, calibration, scene reconstruction
- surfacic approximations, 2D/3D correspondences

- Filtering images to detect edges (Lab)
- Image restauration using heat equation (Lab)
- Mathematical morphology (Lab)
- Determination of the epipolar geometry between two images of the same scene (Lab)
- Mosaïcking (Lab)

Learning materials and literature

- Olivier Faugeras, Three Dimensional Computer Vision: A Geometric Viewpoint, MIT Press, Boston, 1995
- Handbook of Image & Video Processing, A. Bovik (Ed.), Academic Press, 2000
- L.G. Shapiro, J-C. Stockman, Computer Vision, Prentice Hall, 2001

Person in charge :

Dr. Patrick HORAIN (patrick.horain@it-sudparis.eu)

Lecturers :

- Patrick HORAIN : TELECOM & Management SudParis