



Nell'ambito del programma di Visiting Professor
dell'Università di Cagliari
il DMI ospita

il prof. Michel Kocher

University of Applied Science, HES-SO, Yverdon, Switzerland

Image Processing Course

Dal 10 al 14 Luglio 2017, ore 9.00 – 13.00

(Lab. M - Dip. di Matematica e Informatica, via Ospedale 72)

The course is divided into five lectures:

1. **10.07.17 Image sampling and quantisation which describes the image acquisition process.** (a) The sampling theorem (b) How to decimate an image (c) How to quantise or re-quantise an image (d) the k-means algorithm
2. **11.07.17 The Discrete Cosine Transform and its application to Image Coding** (a) The definition of the Discrete Cosine transform (b) The use of the DCT in image coding
3. **12.07.17 A successful Edge Preserving Smoothing Filter : the Non Local Mean.** (a) The definition and the advantages of the EPSF compared to other smoothing filters (b) The programming of the NLM (c) A better result with less computation : the use of Principal Component Analysis
4. **13.07.17 Shape description for classification** (a) Exterior based by using the Fourier descriptors (b) Interior based by using invariant moments
5. **14.07.17 Detection of particular objects, lines and circles** (a) The line Hough transform and the detection of maxima in the Hough space (b) The circle Hough transforms

Material provided For each day, a pdf file explaining the theory will be available.

The correction of the exercises in Matlab will be available the next day.

Structure of the course Theory and practice are interleaved during the lecture.

Practical work is based on Matlab.

The lecture will be given in English.

3 CFU (all days and practical work)

Michel Kocher professor of Modelisation, Signal and Image Processing, University of Applied Science HEIG-VD, Yverdon, Switzerland, researcher on Image Processing, Radiology Department, University Hospital of Geneva, Switzerland.