

TS302 : Multi-rate systems

ECTS credits :

1.00

Evaluation :

S1: ET(1h30,E,sd,sc) x2 + CC(CR TP) x1; S2: ET(20m,O,sd,sc) x2 + Rep(CC) x1

Number of hours :

Combined lecture and tutorial classes : 4.00

Tutorial classes : 5.33

Teacher(s) :

MEGRET Rémi

Title :

Multi-rate systems

Abstract :

This class deals with multi-rate systems. Such systems consider signals at several sampling frequencies (multi-resolution). They can be seen nowadays in various application, such as the now well known JPEG2000 norm, which is based on wavelet decomposition. The gaussian pyramid is another exemple of a multi-rate approach that improves the robustness of image analysis systems. Those approaches share the common base of the digital signal theory and linear filtering.

Plan :

- * Sampling
 - Temporal and frequential point of view
 - Up- and downsampling
- * Image pyramids
 - Gaussian and laplacian pyramids
 - Reconstruction
 - Application to image enhancement and fusion
- * Filter-banks
 - Perfect reconstruction
 - QMF filters
- * Wavelets
 - Time/frequency analysis
 - Orthogonal wavelets
 - Analysis and synthesis multiresolution frameworks
 - Application to image compression, JPEG2000

Prerequisite :

- * Traitement numerique du signal
- * Programmation Matlab