

FILTERING SEGMENTATION AND REGISTRATION OF MEDICAL IMAGES FSR-MED

ECTS	Cours (h)	T.D. (h)	T.P. (h)	Stage (semaines)
3	16		16	

**Mention du master transmettant la
fiche UE :**

IdS

Composante de gestion de l'UE :

Polytech

Responsable de l'UE :

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Statut du responsable :

MCU

PROGRAMME DE L'UNITE D'ENSEIGNEMENT :

The objective of this course is to deepen the students' knowledge on the techniques that filter, segment and register images, which are commonly used in medical imaging.

Approaches such as motion estimation or multi-modal data processing will also be studied.

The courses will address both the basic and more advanced concepts around these techniques, in the context of medical imaging data.

Thomas Grenier 8h + 3h Labs

David Sarrut 5h + 3h Labs

Patrick Clarysse 3h Labs

Nicolas Duchateau 3h + 3h Labs

1. Image Filtering (4h)
Non linear (anisotropic diffusion) and spatiotemporal filtering.
2. Image Segmentation (4h) :
Thresholding and hysteresis, mathematical morphology, hierarchical approach, region based approach
3. Image Registration (8h)
Fundamental elements of rigid, affine and deformable registration
Multi-modality techniques, motion estimation and spatiotemporal analysis.

Labs :

- 1) image registration: implementation of methods based on optical flow (Patrick Clarysse)
- 2) image registration with existing software (Elastix and VV) (David Sarrut)
- 3) image registration: evaluating the quality of sequences tracking (Nicolas Duchateau)
- 4) Filtering and segmentation of 3D medical images (Thomas Grenier)

MUTUALISATION :

