The course *Medical image analysis* gives relatively deep insights into how medical images are generated and analyzed for some of the most important systems that are used in medicine today. The course comprise eight lectures, five classes, one mini project (consisting of three computer laborations) and three additional computer laborations.

**Lectures**
- 1. Introduction
- 2. Local Fourier transforms, analytical signal, quadrature filters, filter optimization
- 3. Orientation representation, using vectors and tensors
- 4. Image enhancement
- 5. MRI
- 6. Image registration
- 7. Image segmentation
- 8. Diffusion & fMRI

**Classes**
- 1. Filter optimization
- 2. Image enhancement
- 3. Image registration
- 4. Image segmentation
- 5. fMRI

**Computer laborations**
- 1. Mini project part 1, filter optimization
- 2. Mini project part 2, estimating the structure tensor
- 3. Mini project part 3, image enhancement
- 4. Image registration
- 5. Image segmentation
- 6. fMRI
Premises
All lectures and classes take place in the seminar room IMT1 on floor 13 and the laborations in the computer labs IMT8 and IMT9 at floor 12.

Literature
- Material delivered at the lectures.
- Course compendium: MRI, fMRI, Image registration and Image segmentation.
- *Signal Processing for Computer Vision*, Gösta Granlund and Hans Knutsson

Examination
To pass the course you need to pass the written exam, the three laborations and the mini project.

Laborations
To pass the laborations you have to demonstrate your Matlab code for the teachers and participate in the lab seminar. For the lab seminar the lab groups prepare a 10 minute presentation for each of the labs, including questions for opposition and discussion.

Mini project
The mini project is presented in a written report. To pass the mini project you need to demonstrate working Matlab code and get an approval of your report.

Communication
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