UNIVERSITÀ
DEGLI STUDI DI MILANO-BICOCCA

COURSE SYLLABUS

Imaging

1920-1-H4102D004-H4102D012M

Aims

Knowledge of the technologies of digital image generation and processing; structure quantification and functional analysis of biological structures and medical devices, at macro and microscopic level. This will include image storage, object creation and visualization, computational technique for functional evaluation of three-dimensional structures (vasculature and bones), as well as the use of software dedicated to medical image processing.

Contents

Numerical techniques for generation of digital images, storage and processing; Generation of surface models and graphical visualization, Processing of image data and structural quantification.

Detailed program

Instrumentation and signal processing for the generation of medical images, technology and algorithms for storage and processing of digital images; Image format and archiving systems; Image segmentation ad object recognition, image processing by machine learning techniques; Numerical generation of surface models and their visualization; Spatial and temporal image registration for different acquisition modalities; Numerical analysis for structural quantification; Visualization techniques and rendering; Generation of digital models for stereo visualization and 3D printing.

Prerequisites

Basic knowledge in mathematics, algebra and physics

Teaching form

Lessons in class, demonstrations by the use of digital image processing software and solution of simple

Textbook and teaching resource

Suggested textbook: The Image Processing Handbook, Seventh Edition, John C. Russ,? F. Brent Neal, CRC Press ISBN-10: 149874026X. Slides of the course will be transmitted to the students using the e-learning platform

Semester

First

Assessment method

Assessment will consist in a final written and oral examination accounting for 60% and 40% of final evaluation, respectively.

Office hours

Monday, 4 to 6PM (Dalmine)