Medical Image Visualization - Analysis and GPU Accelerated Computing

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Learning Objectives:

Aim of the course is to make students familiar with medical image visualization and analysis techniques. Students will prototype applications for visualization, registration, segmentation, and analysis of clinical datasets. Classes will be based on the use of the VTK (Visualization Tool Kit - www.vtk.org) and ITK (Insight Tool Kit - www.itk.org). Use of the Python language will be taught, allowing to quickly prototype solutions. Visualization software architectures and algorithms will be discussed. Students will become familiar with the architecture of VTK, will learn how to extend it, how to develop GUI based applications, and how to interact and manipulate objects in 3D visualizations. Lastly students will learn how to use GPUs to accelerate computationally intensive analysis tasks. This course might be useful also for students with general interests in visualization of scientific data, for example in Physics, Maths, and Computer Science. Assignements can be adjusted to specific needs.

Prerequisites: ENGG 111: Digital Image Processing is required as a prerequisite, as well a good C/C++ practice and understanding of Object Oriented programming. Students lacking these prerequisites are encouraged to discuss admission with Dr. Borsic.

Evaluation: 40% Assignements, 20% Midterm Exam, 30% Final Project, 10% Oral Project Presentation.

Delivery: The course will be delivered on the basis of a minimum attendance of 5 students. Students interested in taking the course are encouraged to contact Dr. Borsic, to facilitate planning.