



Validation of Post-Operative MRI/US Registration based on derived Landmarks

Project Management and Software Development
for Medical Applications

General Info

Project Title: Validation of Post-Operative MRI/US
Registration based on derived Landmarks

Contact Person:

Wolfgang Wein (wein@imfusion.de)

Bernhard Fuerst (be.fuerst@tum.de)

MRI images. The resulting deformation fields allow the transfer of landmarks from pre- to post-operative MRI, and from pre-resection to post-resection US by use of the known MRI relation. After considering the resected areas, the derived landmarks are used for validation of registration of post-resection US with post-operative MRI.

Project Abstract

Registration of pre-operative magnetic resonance imaging (MRI) and intra-operative ultrasound (US) is essential to neurosurgery, and has been achieved by the MRI/US Team at CAMP. However, the registration of post-resection US with post-operative MRI is also achievable with the novel LC2 technique, but the validation is problematic, as no landmarks have been set by experts. Therefore, a new method for validation needs to be established and implemented.

Student's Tasks Description

The student will get familiar with the ImFusion Framework for MRI/US and CT/US registration. Furthermore, a state-of-the-art method for deformable single-modal registration needs to be set up with the framework, which will allow the deformable registration of pre- and post-operative

Technical Prerequisites

C/C++ and basics of OpenGL

Administrative Info

Working Time: 150 hours

Project Location: Garching

Required Equipment: The computer is set up and can be accessed using remote desktop.

Timeline and Milestones

The timeline and milestones are closely connected to the outline of the lecture. Therefore, kick-off, midterm and final presentations are required. Further details and milestones will be set to fit the student's skills.

Please send the completed document to us (Ralf.stauder@tum.de) before the project proposal deadline, April 8th. Please note that this proposal will be evaluated by the BMC coordinators and will be assigned to a student only in the case of acceptance.