The **Institute of Radiation Medicine** and the **Dept. of Radiation Oncology TUM** are looking for a

Master student in informatics/electrical engineering/physics

Project title: Design and implementation of a control system for a novel cancer treatment system in radiation oncology for preclinical research

Background: Microbeam radiation therapy (MRT) is a novel, still preclinical approach for cancer treatment that uses micrometer sized x-ray treatment fields. One of the major obstacles for a clinical application of MRT is the availability of appropriate radiation sources. Currently only large synchrotrons provide the necessary dose rates and radiation quality required for clinical treatments. In our team, we develop a system that generates microbeams for preclinical studies with a next generation x-ray tube.
In order to be useful for preclinical radiotherapy trials the current applicator requires

- A safe systems engineering approach
- A control system consisting of a client with GUI and a server connected via ethernet. The server needs to be capable of handling several clients, and monitor and control multiple hardware-interfaces

Purpose of the master project will be the design and set-up of such a system.

Methods and tasks:
- Design of a detailed requirements list for the main control software and hardware interfaces
- Design of an overall system architecture with functionality and division into subsystems
- Implementation of Modules and GUI design
- Quality assurance – Verification and testing

Time schedule:

Month of Thesis	1	2	3	4	5	6
Literature	X					
System Design	X	X				
Architecture Design		X		X		
Module Design and Implementation		X	X	X		
Unit Testing			X	X	X	
Integration and System Testing				X	X	X
Write thesis						X

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