

PhD position in CT metal artifact reduction using MRI.

We are seeking a PhD student for 3 years to work on a project within CT metal artifact reduction using MRI. The project is hosted jointly by the division of radiotherapy at Herlev & Gentofte Hospital, Copenhagen, Denmark, as well as the department of applied mathematics & computer science at the Technical University of Denmark (DTU Compute). The project is further affiliated with the national research initiative of the Danish Center for Particle Therapy (NCPT).

Project description

Streak artifacts on CT images caused by metal implants in patients, such as dental fillings and hip replacements, present a challenge for accurate CT-based dose calculations. This is especially the case for proton therapy which is much more sensitive to changes in CT intensities as compared to conventional radiotherapy with photons. Most patients receiving radiotherapy at Herlev are both CT- and MR-scanned for radiotherapy planning purposes. The aim of this PhD project is to use the information from the MRI to reduce the artifacts on the corresponding CT scan and thereby improve the dose calculation accuracy. The radiotherapy clinic at Herlev & Gentofte Hospital and DTU Compute have a strong research tradition and collaboration within MRI based radiotherapy. The project will therefore be able to build on the experiences already obtained within this field.

Responsibilities and tasks

Responsibilities and tasks include (but not limited to):

- Developing and validating novel computational models for CT metal artifact reduction using MRI.
- Dosimetric characterization of model corrected CT scans.
- Collecting existing patient CT and MRI scans and raw data.
- Setting up and managing possible additional imaging protocols in close cooperation with the scanning staff.
- Writing biannual reports.

Qualifications

The PhD candidate should have a master's degree within medical physics, computer science, or electrical engineering, or a similar degree with an equivalent academic level. Prior exposure to radiation dosimetry and/or medical imaging modalities is an advantage.

Approval and enrollment

The scholarships for the PhD degree are subject to academic approval, and the candidates will be enrolled in one of the PhD programs at DTU.

We offer

An active research environment in both radiotherapy (Herlev & Gentofte Hospital) and medical image computing (DTU Compute). There are currently over 10 PhD and post docs working in these areas.

Herlev & Gentofte Hospital treat 3.500 cancer patients with radiotherapy annually. The hospital has obligations to carry out research, development and education. The radiotherapy clinic is an integrated part of the department of oncology. The section of radiophysics is mainly involved in the preparation, quality assurance and development of the radiotherapy treatment. The clinics currently has nine linear accelerators, an HDR afterloader, kV X-ray equipment, two CT scanners, one MR scanner, dose planning software, and dosimetric equipment.

For further information, please contact the project supervisors at Herlev & Gentofte Hospital, Jens Edmund (Medical physicist, PhD, DABR): jens.edmund@regionh.dk or DTU Compute, Koen Van Leemput (Associate Prof., PhD): kvl@dtu.dk.

Salary and appointment terms

The salary and appointment terms are consistent with the current rules for PhD students at DTU. The period of employment is 3 years.

Application

Please submit your application no later than **15 November 2015** via this link:

<https://www.regionh.dk/job/s%C3%B8g-job/Sider/Ledigt%20job.aspx?positionid=196659>

Applications must be submitted as **pdf files** containing all materials to be given consideration. The files must include:

- A letter motivating the application (cover letter)
- Curriculum vitae
- Grade transcripts and BSc/MSc diploma
- If applicable: List of publications

All interested candidates irrespective of age, gender, race, disability, religion or ethnic background are encouraged to apply.