

PhD student on the project AUTOPT

The Erasmus MC Cancer Institute is searching for a PhD student to develop and investigate advanced tools for mathematical optimization of proton therapy for cancer patients (AUTOPT project).

Research & Education

36 hours

Radiotherapy

Closing date 03-03-2021

06.18.21.TD

Job description

Treatment of cancer with proton beams is highly promising compared to treatment with conventional X-ray beams. Due to the specific beam characteristics, proton therapy can be used to more successfully eradicate tumors or to reduce currently observed severe radiation-induced side-effects with often a detrimental impact on the patient's quality of life after cure.

To fully employ the potential of proton therapy, for every patient the delivered dose distribution needs to be maximally tailored to his/her tumor characteristics and anatomy. This is not feasible with the worldwide applied time-consuming, interactive trial-and-error establishment of patient-specific irradiation parameters, including beam entrance angles, proton energies and pencil beam intensities ('manual' planning). Novel, advanced, automatic tools for individualized optimization of proton therapy are required (automated planning) to realize a tailor-made plan. The candidate selected for this project will develop and investigate such tools.

Work environment

Erasmus MC Cancer Institute encompasses one of the largest radiotherapy departments in Europe, treating over 5500 patients per year. The department has a wide-ranged and internationally renowned research program, focused on improvement of clinical radiotherapy practice. A lot of the applied research is physics and technology driven. The department is a world leader in development of radiotherapy optimization algorithms.

One of the department's unique assets is a partnership in the Holland Proton Therapy Center (HollandPTC), together with Delft University of Technology (TU Delft) and Leiden University Medical Center (LUMC). The research of the selected candidate will be performed in a multi-disciplinary team with physicists, mathematicians and clinicians from Erasmus MC, LUMC, TU Delft and HollandPTC. There

will be a close collaboration with a second PhD student, appointed at LUMC for clinical validation and application of mathematical optimization tools.

As a PhD student you will have access to the courses of the Erasmus MC postgraduate school of Molecular Medicine and to the PhD educational program on medical physics, and you will participate in the departmental journal clubs, and R&D meetings.

Qualifications and skills

You have a master degree in (Computational) Physics, (Applied) Mathematics, Operational Research, or a related discipline.

You are enthusiastic about analyzing and solving problems by programming (Matlab, Python, C/C++), and interested in modelling.

You have a practical, result-driven working attitude, and you are an excellent team player.

Good academic writing and presentation skills in English are required as well.

Before you apply please check our [conditions for employment](#).

Terms of employment

You will receive a temporary position for 4 years. The gross monthly salary is € 2.495,- in the 1st year and increases to € 3.196,- in the 4th year (scale OIO). The terms of employment are according to the Collective Bargaining Agreement for Dutch University Medical Centers (CAO UMC).

Information and application

For more information about this position, please contact:

Prof.dr. B.J.M. Heijmen, PI, telephone: [+31\(0\) 650 00 17 19](tel:+31(0)650001719) or email: b.heijmen@erasmusmc.nl

Dr. S. Breedveld, assistant professor and co-PI, email: s.breedveld@erasmusmc.nl

For queries regarding your application, please contact Jerry Chandansingh, Recruiter, by phone number: [+31 \(0\)6 500 310 06](tel:+31(0)650031006). If you are excited by the thought of this position and would like to apply, please do so by using the application form on our website.

No agencies please.