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TUDelft | Delft University of Technology

Faculty of Applied Sciences
Radiation Science & Technology

Postdoc position

www.rst.tudelft.nl

In-vivo verification of adaptive proton therapy based on prompt gamma imaging

High-energy protons are nearly ideal particles for irradiating tumors as they deposit most of their energy at the end of their path. However, the highly localized dose deposition makes proton therapy sensitive to variations in the patient's anatomy, which may result in overdose to healthy tissues and/or underdose to the tumor.

The ADAPTNOW project brings together academic groups, a proton therapy center, and suppliers of proton therapy equipment to develop a new, highly-automated, image-guided, online-adaptive form of proton therapy, so as to reduce treatment-related side effects and improve quality of life. Since state-of-the-art quality assurance procedures are time-consuming, they are incompatible with online plan adaptation. Therefore, a method for online verification of the delivered dose in vivo will be developed based on the imaging of the prompt gamma rays produced by the proton beam within the irradiated tissues.

For this project we are looking for an enthusiastic and creative physicist motivated to push the limits in proton therapy in close collaboration with colleagues from the partner institutions University Medical Center Rotterdam and Leiden University Medical Center, who have joined forces with TU Delft to realize the first treatment center for proton therapy in The Netherlands: the Holland Particle Therapy Center (www.hollandptc.nl). You will be working on the development and validation of tools for daily, non-invasive, in-vivo quality assurance of the online-adapted treatment plan based on the automated comparison of predicted and measured prompt gamma signals.

Requirements include a PhD in (Applied) Physics and affinity with medical physics, simulation, statistical signal processing, and image analysis. Excellent English and communication skills are requested. Experience in relevant areas, such as nuclear physics, statistics, machine learning, and/or image processing, is a plus. You should possess a pro-active, independent, problem-solving, and result-oriented work attitude. The successful candidate is expected to publish results in peer-reviewed scientific journals and to participate in international conferences.

Applications must include a cover letter, CV, list of publications, scans of diplomas, and the names and contact details of three referees. Please send your application by email to Dr. D.R. Schaart: d.r.schaart@tudelft.nl.

Screening will start as soon as applications are received and will continue until the position has been filled.