PhD position: MR thermometry feedback-based planning

Recruiting organization

Dr. Sennewald Medizintechnik GmbH, Schatzbogen 86, 81829 Munich, Germany (SMT)
in Collaboration with
Ludwig -Maximilians-University Munich, Germany (LMU) and
Erasmus MC Cancer Institute, Rotterdam, The Netherlands (EMC)

Background

MR thermometry is the only three-dimensional, non-invasive method used in clinical practice to measure temperatures during hyperthermia treatments. Using the temperature-dependent shift of the proton resonance frequency (PRF) the temperature changes are calculated from MRI phase images. Motion artifacts and noisy data are currently limiting the value of the created 3D temperature maps.

Approach

The PhD candidate will be responsible for development and benchmarking of imaging and computational methods for reconstructing true 3D temperature distribution from noisy MR imaging data. Sparse invasive and 3D non-invasive (MR) thermometry data will be compared and merged with predicted temperature distributions from calculated models. Novel MRI scanning approaches will be assessed and optimized to enhance image data quality by focusing on known artefacts. The candidate will start to work on benchmarks for easy (e. g. extremities) and difficult (e. g. pelvis, abdomen) to monitor regions. The benchmarks will be used to compare the clinical MR thermometry performance using the newly developed technology. The last step entails the development of thermal and biological-effective doses for radiotherapy and hyperthermia reporting based on the reconstruction in collaboration with other ESRs.

Your experience

- highly ranked MSc in physics, medical engineering or similar
- Strong analytical and mathematical skills
- Experience in MRI and image data pocessing
- Experience in (matlab/python) programming and optimization methods
- Scientific curiosity and team working skills
- Fluency in spoken and written English

We seek a highly motivated scientist, able to work independently as part of a multidisciplinary team within an international network. The candidate is willing to work part-time abroad.
The candidate must not have more than 4 years *research experience* after obtaining the master degree and must not have resided or carried out his/her main activity (work, studies, etc.) in Germany for more than 12 months during the past 3 years.

Our offer

This 3-year PhD candidate position is funded by the Marie Skłodowska-Curie actions of the European Union's Horizon 2020 research and innovation program under grant agreement No 955625. You will be appointed as fulltime PhD candidate for 3 years with Dr. Sennewald Medizintechnik. Your PhD will be co-hosted and awarded by LMU under co-supervision of EMC. The Marie Skłodowska-Curie (MSCA) program offers a highly competitive and attractive salary and working conditions. The candidate will receive a salary in accordance with the regulations for early stage researchers. Exact salary will be confirmed upon appointment [living allowance 38.000 EUR/year plus monthly mobility allowance of 600 EUR. An additional monthly allowance of 250 EUR is applicable depending on family situation. In addition to their individual scientific projects, all fellows will benefit from further continuing education, which includes internships and secondments, a variety of training modules as well as transferable skills courses and active participation in workshops and conferences.

Your application

Details of the recruitment procedure and the online application link can be found on www.hyperboost.eu/vacancies. For further information please contact Martin Wadepohl (martin.wadepohl@sennewald.de / +49 89 54 21 43 10)