Doctoral Candidate 10 - Develop a DL-based qMRI method for robust multi-compartment diffusion-relaxometry

Host Institution	Erasmus MC, The Netherlands
PhD enrolment	Erasmus MC, The Netherlands
Primary Supervisor	Dr. Dirk Poot, Dept. of Radiology and Nuclear Medicine
Subject area	MR Physics, data harmonization

About this doctoral project and your tasks

Observing the movement of water with diffusion MRI provides great insights into tissue abnormalities. However, at the voxel (2-20mm^3) level there often are multiple tissue types with different diffusion and relaxation properties. In this project you will investigate and advance **advanced multi-compartment diffusion-relaxometry acquisitions** that can disentangle these tissues. To achieve trust and clinical usability, the results of such acquisitions should be **stable in time and similar across scanners** with differences in hardware performances. By harmonizing the acquisition where possible and training deep leaning based analysis methods to be invariant to the residual scanner differences diagnostic utility and trustworthiness of the results is maximized.

Your tasks will include :
- Sequence setting optimization
- Designing and implementing a DL architecture for robust multi-compartment diffusion-relaxometry acquisitions
- Write scientific papers
- Present at scientific conferences

Foreseen secondments

For this project, we foresee secondments to:

- Prof. dr. Rita Nunes (3 months) at **Instituto Superior Técnico** (Portugal)
- Prof. dr. Jan Sijbers (3 months) at **University of Antwerp** (Belgium)
- Dr. Timo Schirmer (3 months) at **GE Healthcare** (Germany)

About the host institution and research group

The research will be conducted at the **MR physics group** as well as the **Biomedical Imaging Group Rotterdam (BIGR)**, which are part of the department of Radiology & Nuclear Medicine of the Erasmus MC, University Medical Center Rotterdam. The department of Radiology & Nuclear Medicine of the Erasmus MC is one of the largest medical imaging departments in Europe with 10 clinical MRI scanners at several field strengths. The department has an international and diverse character with a good balance between internationally recognised, high-end research and an excellent social working environment. We do not discriminate on the basis of sex, gender, belief, culture, place of birth or occupational impairment when recruiting and selecting staff and students. You will collaborate with a team of experienced researchers with backgrounds in **image analysis, machine learning, radiology, pathology, surgery, and oncology.** Within this project we collaborate with IQ-BRAIN partners and specifically also with GE Healthcare.

About the offer

- The selected candidate will be employed by Erasmus MC for **36 months** on the MSCA-DN project, with extension up to 12 months to complete the doctoral degree.
- Doctoral candidates are offered a **competitive remuneration** based on the MSCA allowances and the regulations of the host institution. You will receive a gross monthly salary according to the standard wages for researchers in training (OiO) at Erasmus MC (currently min. € 3017).
- **Expected start date**: between April and September 2025. We encourage last-year master students who will graduate by this time to already apply.

More information is available in the general information document for IQ-BRAIN positions.

Specific profile and requirements

- Your profile aligns with the **general requirements and eligibility criteria** of the IQ-BRAIN project.
- You should be an independent and highly motivated researcher with **an MSc or MEng degree in a technical domain** (e.g., physics, computer science, mathematics, informatics, engineering) (or will have by the time of your appointment).
- Experience with **MR imaging, image processing, and/or machine learning** is highly valued.
- You should be able to communicate and work with researchers from various fields. Excellent proficiency in English is required.

How to apply

All applications must be submitted via the **IQ-BRAIN job platform**: https://www.uantwerpen.be/en/projects/iq-brain/jobopenings/apply/.

Deadline for applications: 1 December, 23:59. More information about the application procedure is available in the general information document for IQ-BRAIN positions.

More information

For additional information about the research project, contact:

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