Doctoral Candidate 14 - MRI image quality enhancement for quantitative applications

Host Institution	Icometrix, Belgium
PhD enrolment	University of Antwerp, Belgium
Primary Supervisor	Dr. Thibo Billiet, Icometrix
Subject area	Image quality transfer, AI, segmentation, diffusion MRI

About this doctoral project and your tasks

The goal of this project will be to **expand the usability of brain qMRI data that has limitations** (e.g. limited resolution, SNR or CNR). By using AI (machine learning and/or deep learning), existing MRI data will be enhanced to allow accurate segmentation (e.g. lesions or tissue structures) and/or to allow qMRI modeling (e.g. diffusion tractography).

The focus will be on **tractography** based on DTI datasets with few gradient directions and/or accurate **volume segmentations** based on low spatial resolution T1-weighted images. The clinical added value of MRI biomarkers extracted from such enhanced datasets will be evaluated in MS patients in comparison with conventional brain imaging.

Your tasks will include :

- Perform top class research in the field of medical image processing
- Find creative solutions for challenging image processing questions
- Develop novel quantitative image processing pipelines with a special focus on deep learning (programming in Python)
- Develop and execute validation of novel algorithms
- Data management and data quality control
- Stay informed on the developments and trends in the field of medical image processing
- Discuss the progress and intermediate results of research projects both internally and externally
- Present your work to an international multi-disciplinary community
- You will work actively on the preparation and defense of a PhD thesis in magnetic resonance imaging.
- You will write several high-quality scientific articles related to the research project and publish them in peer-reviewed journals.

Foreseen secondments

For this project, we foresee secondments to:

- Prof. Dr. Pieter Van Dyck (2 months) at **University Hospital Antwerp** (UZA, Belgium)
- Prof. Dr. Jorge Cardoso (3 months) at **King's College London** (United Kingdom)
- Dr. Ana-Maria Oros-Peusquens (2 months) at **Forschungszentrum Jülich** (Germany)

Funded by the European Union

IQ-BRAIN is an MSCA-Doctoral Network funded by the European Union, starting in December 2024 (GA No. 101169519).

About the offer

- The selected candidate will be employed by icometrix for **36 months** on the MSCA-DN project.
- Doctoral candidates are offered a **competitive remuneration** based on the MSCA allowances and the regulations of the organisation. icometrix has received the following EU-grant to recruit a Doctoral Candidate (DC): monthly Living Allowance € 3.400; monthly Mobility Allowance € 600; and monthly Family Allowance € 660 (only if applicable). Please note that the final monthly, gross salary will result from deducting (from the mentioned amounts) all compulsory national labour taxes (social security, etc.) to be borne by the employer. Moreover, funding is available for technical and personal skills training and participation in international research events.
- **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.

About the host organisation

ico**metrix** is a fast-growing company focused on impacting the lives of people with neurological conditions through its unique AI solutions that assist radiologists and neurologists in the reading of brain MRI and CT scans. The headquarters are based in Leuven, Belgium, but ico**metrix** already has a US team present. Our customers include hospitals and pharmaceutical companies. The ico**brain** solutions for people with multiple sclerosis, Alzheimer's disease & other forms of dementia, stroke, brain trauma, and epilepsy, are already impacting clinical care decisions in many hospitals worldwide. Recently, based on the submitted evidence by ico**metrix**, a new CPT III reimbursement code was issued by the AMA in the US, which is driving adoption of ico**brain** as the standard of care significantly. The ico**metrix** team includes enthusiastic, team-oriented and multi-cultural colleagues with a range of technical and medical backgrounds. We enjoy an innovative and challenging working environment and are driven by our core values: impact, trust, collaboration, respect, and crazitivity.

Specific profile and requirements

- Your profile aligns with the **general requirements and eligibility criteria** of the IQ-BRAIN project.
- You have a master's degree in **biomedical engineering, physics, computer science or related fields** (or will have by the time of your appointment).
- Background in **magnetic resonance imaging (MRI)** and/or **scientific computing** is appreciated.
- Experience in **Medical Image Computing** (e.g. master thesis) and/or **Deep learning knowledge** is an asset.
- Experience in **Scientific Programming (preferably Python)**
- Fit with our values and culture
- Work accurately and independently as well as within a multidisciplinary team
- Eager to learn, entrepreneurial, multicultural attitude, results-oriented
- Fluent in English, other languages are an asset

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.

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More information

For additional information about the research project, contact:

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