Doctoral Candidate 7 - Trustworthy AI for DL-based reconstruction of multi-parametric qMRI

Host Institution	Technische Universität München, Germany
PhD enrolment	Technische Universität München, Germany
Primary Supervisor	Prof. Dr. Daniel Rueckert, Chair for AI in Healthcare and Medicine
Subject area	Robust and trustworthy DL, verification of DL approaches, DL-based image reconstruction

About this doctoral project and your tasks

The project will address the development of trustworthy DL approaches for the reconstruction of multi-parametric qMRI with a focus on **robust and reliable/safe AI approaches**. To ensure robustness, the project will explore **adversarial data augmentation** techniques which exploit prior knowledge about the types of variations that are likely to occur in practice. To ensure reliability and safety, we will employ and adapt **verification techniques** for neural networks that provide guarantees for performance given certain input variations. These verification techniques will also be used to identify edge cases which can then be automatically added to the training.

Your tasks will include:
- Carrying out independent PhD research on the topic proposed
- Publishing your high-quality research in international journals and conference proceedings
- Collaborating with IQ-BRAIN project partners as well as local experts for your project
- Engaging with and further supporting the research and (limited) teaching activities in the lab

Foreseen secondments

For this project, we foresee secondments to:

- Dr. Thanh Vân Phan (3 months) at **Icometrix** (Belgium)
- Prof. Stefan Klein (3 months) at **Erasmus MC** (The Netherlands)
- Prof. Matthan Caan (3 months) at **Amsterdam UMC** (The Netherlands)