

Master's Thesis

AI Meets Anatomy - Developing Algorithms to Automatically Analyze Bone Shape in Large Populations Using MRI and Artificial Intelligence

Description

The Department of Diagnostic and Interventional Radiology (University Hospital Aachen) owns or has access to large datasets of approximately 50,000 magnetic resonance images (MRI) studies of patients' knee joints. We have already worked on using AI algorithms and shape models to analyze the bone shape of the femur, tibia, and patella. By building on these methods, you will develop tools for segmentation, registration, and post-processing, and apply them to our large database of knee MRI studies. Thereby, you will obtain clinical measures (indicating the presence or absence of pathology) and -potentially- redefine our understanding of bone anatomy and alter surgical treatment.

Your Profile

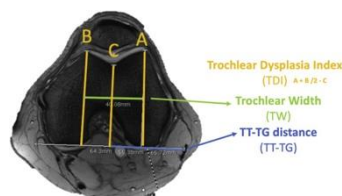
- Physics or engineering student with good grades;
- Familiarity with programming in Python (ideally PyTorch);
- A strong interest in and excellent general understanding of AI methods.

What we Offer

An interdisciplinary environment with medical doctors, post-docs in physics, and PhD candidates in engineering and physics. The machine learning group is led by PD Dr. med. Dipl.-Phys. Daniel Truhn (Radiologist and Physicist) and PD Dr. med. Sven Nebelung (Radiologist). Our research group is characterized by mutual support, close supervision, and regular scientific meetings.

Whom to Contact

Interested? Please get in touch via e-mail at snebelung@ukaachen.de or dtruhn@ukaachen.de. We are looking forward to hearing from you.



AI-extracted bone shapes (left) and exemplary measurement of a clinical measure (right)