Master's Thesis

Prevent the Diagnosis from Limping - Developing AI Algorithms for the Automated Diagnosis of Knee Joint Pathologies on MRI

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. One particular dataset contains approximately 15,000 MRI studies of the knee with dedicated labels of relevant pathologies. Your task is the training and evaluation of sophisticated AI algorithms for automated diagnosis. You will make use of state-of-the-art machine learning methods (convolutional neural networks and transformer architectures) and use enhanced data augmentation and algorithmic approaches to increase the diagnostic accuracy.

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.
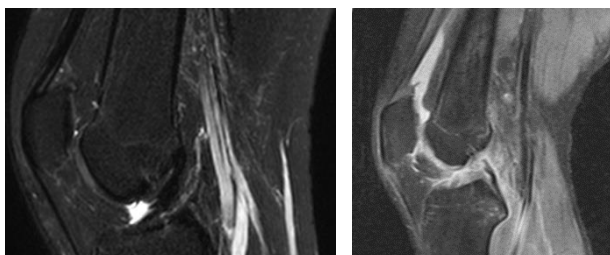
Knee MRI study with an intact (left) and injured anterior cruciate ligament (right)