Post-doc Positions in Medical Image Processing/MRI/AI

dBRAIN is an interdisciplinary initiative within the 'Digital Futures' initiative at KTH Royal Institute of Technology, Stockholm (https://www.digitalfutures.kth.se/research/collaborative-projects). The goal is to better understand neurodegenerative diseases such as Parkinson's disease and Alzheimer's disease. We combine computational modeling, machine learning and topological data analysis to identify causal links among disease biomarkers and disease symptoms. This understanding should improve diagnosis, prediction of the disease progression and suggest better therapies. We are now looking for up to five postdocs. Each selected candidate will work in close collaboration with other PIs in the dBrain consortium, including researchers and clinicians at Karolinska Institute and Karolinska Hospital.

Two of the positions deal with medical imaging and medical image processing: one in **image processing of high-dimensional brain imaging data**, and one in **magnetic resonance elastography in the brain**.

Medical imaging modalities such as Magnetic Resonance Imaging (MRI) often produce **high-dimensional image data** in vector or tensor format, e.g. diffusion tensor MRI or functional MRI. For the computationally demanding post-processing of such data, we use modern machine learning techniques like convolutional neural networks, graph convolutional networks and reinforcement learning. This project will deal with developing, adapting and applying such techniques to imaging data from patients with neurodegenerative diseases, available to us thanks to our close cooperation with Karolinska Institute.

Magnetic resonance elastography (MRE) in the brain is a technique of magnetic resonance imaging (MRI) in which mechanical properties of the brain tissue are estimated non-invasively. Currently, MRE reconstruction is challenging, especially for young people. Preliminary studies have shown that artificial intelligence (AI) is promising for improving MRE reconstruction. In this project, we aim at characterizing the mechanical properties of the brain through MRE in people between 9-15 years old and at correlating them with risk factors for developing anxiety disorders. The research is carried out in close collaboration with Stockholm University.

The workplace for these two positions will be the Department of Biomedical Engineering and Health Systems, located in Huddinge in Southern Stockholm, next door to Karolinska university hospital Huddinge, a cross-disciplinary research environment focusing equally on engineering excellence and clinical usability.

Applications to the positions can be submitted only via the the official KTH website (https://www.kth.se/en/om/work-at-kth/lediga-jobb):

Postdoc in image processing of high-dimensional brain imaging data (deadline April 30)

Postdoc in magnetic resonance elastography in the brain (deadline April 30)

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