

Helmholtz Call for Chinese Applicants Interested in Running for CSC 2021 Fellowship

- Helmholtz Centre:** Forschungszentrum Jülich GmbH – www.fz-juelich.de
- Department/Institute:** Institute of Neuroscience and Medicine, Medical Imaging Physics (INM-4), https://fz-juelich.de/inm/inm-4/EN/Home/home_node.html
- Supervising scientist:** Prof. Dr. J. N. Shah, Dr. J. Dammers
- University for registration or for a future degree:** RWTH Aachen University
- Research Field:** Machine and deep learning, data science, neuroimaging
- Position open for:** **PhD Student X** **Sandwich PhD Student**
- Title of the research:** Deep learning-based analysis in functional neuroimaging

More description of research topic:

In multimodal recordings, such as magneto- and electroencephalography (MEG, EEG) or functional magnetic resonance (fMRI) information about the underlying processes is recorded using different neuroimaging modalities. Tackling the aim of decoding the mechanisms underlying specific brain functions, the challenge lies in combining such complementary information as these different activation profiles act on different spatial and temporal scales. **In this project, we aim at utilizing deep learning technologies for multimodal data integration** by means of combining different strategies from machine and deep learning to optimally extract the spatial and temporal features of neurophysiological processes. For analysis, we will use existing recordings of i) simultaneous fMRI and EEG as well as ii) fMRI and MEG data. The developed algorithm will be applied to the analyze task related (i.e., auditory, visual and motor tasks) multimodal data from fMRI/EEG hybrid imaging as well as the analysis of spontaneous, so-called resting state, activity recorded separately using fMRI and MEG for cross-modal data integration, each with high spatial and temporal resolution, respectively. In total, data from a cohort of about 100 volunteers will be used.

Specific requirements:

Required: Experience with the methodology of deep learning as well as strong signal processing and programming skills.

Obligatory: Excellent educational records in the related field. Programming skills in Python, TensorFlow and Keras.

Desirable applicant's background: Computer Science, math or physics, electrophysiology, neuroscience and related. Good knowledge of English language

Working Place: Forschungszentrum Jülich, Germany (near Cologne)

Earliest Start: September/October 2021

Language Requirement: Very good knowledge of English language, written and spoken. German language courses are organised in the context of our in-house training program and are free of charge.

Name and Address of the Supervisors: Dr. J. Dammers, Prof. Dr. N. J. Shah,
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