

PhD position

at the intersection between clinical neuroscience and machine learning

"Data-driven approaches to structure and function in schizophrenia"

In an innovative approach, we will investigate the neurobiological aberrations in schizophrenia that underlie disturbed thinking, speech, and behavior. Although agnostic to one specific psychological process, we have a special interest in altered social-affective processes in schizophrenic individuals because these cognitive skills set human beings apart from other species. We will use data-driven methods that formally extract patterns in large datasets with a minimum of a-priori assumptions. The project will take place in close collaboration between the neuroimaging methods group in Paris, France, and the cognitive neuroscience group in Düsseldorf/Jülich, Germany. Completion of this PhD program allows you to become part of the badly needed new generation of computationally trained imaging neuroscientists.

What you would work on

- Work on neuroimaging questions in psychiatry that matter with multivariate statistical tools applicable beyond imaging neuroscience.
- We aim at the characterization of the neurobiology of schizophrenia neurobiology from the perspective of brain area and network architectures. We will perform clustering algorithms and network decomposition for dimensionality reduction. The feature-engineered data will form the basis for unsupervised structure discovery (e.g., t-SNE), supervised classification (e.g., support vector machines), brain-behavior analyses (e.g., Lasso/Ridge/ElasticNet regression analyses), and resting-state connectivity analyses (e.g., group-sparse covariance estimation).
- The multi-modal analyses will be performed on structural (voxel-based morphometry) and functional (resting-state data) from a Europe-wide 8-site datasets ($n \sim 500$).
- This position is an excellent opportunity to learn how to combine clinical neuroscience and recently emerged statistical techniques.

What we expect

- High motivation for inter-disciplinary challenges
- An analytical, problem-solving mindset
- MSc or equivalent in computer science, physics, biomedical engineering, psychology, medicine or biology (natural-science-related background is preferred)
- Experience with programming is a big plus (especially in Python)
- Fluent in written and oral English language

What we provide

We provide intramural funding for a three-year PhD position. The position is available starting from September 2015. Applications will be considered until the position is filled. Payment will correspond to salary grade 13/2 of the German Collective Bargaining Agreement for the Civil Services (50% TVL-13, <http://bit.ly/1Rf8TjY>).

The project will be conducted in close collaboration with the machine-learning group at Neurospin, France, (Dr. Bertrand Thirion) and cognitive neuroscience group at the Forschungszentrum Jülich, Germany, (Prof. Simon Eickhoff).

Application

Send CV, motivation letter, and contact details of two academic referees to

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psychosomatik/team/bzdok-danilo.html](http://www.ukaachen.de/kliniken-institute/klinik-fuer-psihiatrie-psychotherapie-und-psychosomatik/team/bzdok-danilo.html)