The Brain Dynamics and Imaging Methods Group within the Section of Systems Neuroscience is closely associated with the Departments of Psychiatry and Psychology and the Neuroimaging Center (NIC) at the TU Dresden (TUD). Our research focusses on studying brain functions related to emotions and cognitive control. In particular, we like to understand how the state of the brain changes on the time scale of seconds to minutes, how the underlying brain states differ between tasks and individuals, and how such differences relate to human behaviour. In this context, we are also keen to develop better methods that improve reproducibility of brain imaging measures, especially from machine learning. We rely primarily on magnetic resonance imaging (MRI) data for our research goals, but are also open to supplementary methods such as neurofeedback or transcranial stimulation.

Currently, we are involved in two DFG-funded Collaborative Research Centers (CRCs): (SFB 940) on "*Volition and Cognitive Control: Mechanisms, Modulators, and Dysfunctions*" and (TRR265) on "Losing and Regaining Control over Drug Intake". These centers together with the (NIC) and the Center for Information Services and High Performance Computing (ZIH) provide an outstanding scientific infrastructure and ideal environment for interdisciplinary research.

Our group currently invites applications for two

PhD Students / E13 TV-L 75% (f/m/d)

The positions are initially funded for 2 years. Prolongation is intended. We are seeking highly motivated students with a background in psychology, neuroscience, computer science or mathematics and a keen interest in applying advance analysis methods such as machine learning to brain imaging data and neuroscientific questions. The candidates are strongly encouraged to contribute ideas to the future of the project in line with personal interests. To complement each other, one students should be stronger in programming and machine learning while the other one should have a background in cognitive neuropsychology. The objective of your work will be to identify and improve subject-specific, reproducible measures of brain function that relate to cognitive control and addictive behaviour. Especially salience attribution is a current focus of the work group.

Your tasks:

- Extract measures related to cognitive control from existing functional MRI data sets
- Develop existing, advanced analysis methods further to infer causal interactions between brain regions
- Investigate the reproducibility of such measures
- Improve reproducibility of such measures using machine learning techniques and/or improved experimental designs
- Investigate the intra-subject variability of such measures

- Investigate the relationship of such measures to addictive behaviour and/or self-control
- Contribution to the acquisition of relevant data
- Contribute to related grant proposals
- Interact with other CRC scientists and students
- Preparing manuscripts and presenting results at conferences

Your profile:

- University degree (Master or Diploma) in psychology, cognitive neuroscience, computational neuroscience, computer science, mathematics or related disciplines
- A keen interest in applied computational sciences and neuropsychology
- Solid programming skills in Python or Matlab
- Expertise in the analysis of fMRI-data would be advantageous
- Good English language skills (speaking and writing)
- An interest in interdisciplinary cooperation and team work

We offer you:

- Being part of a structured PhD graduate program
- Working in a highly interdisciplinary team with leading cognitive and computational scientists that will support you

We look forward to receiving your complete application (one PDF-document including a cover letter with a brief summary of research interests, full CV, and contact information for two references) until Nov. 30th, 2021 or until positions filled. For further information or to apply, please contact: Michael Marxen, Ph.D. (michael.marxen@tu-dresden.de).