PhD Program between Freie Universität Berlin (FUB) and the China Scholarship Council (CSC)

Open PhD Position at Freie Universität Berlin, offered only to Chinese CSC scholarship candidates 2027

Department/Institute: Department of Biology, Chemistry, Pharmacy / Institute of Biology / Brain and Behavior Group, Human Neuroethology Unit

Subject area: Neurobiology / Cognitive Neuroscience / Human Neuroscience / Auditory Perception

Name of Supervisor: Dr. Yuranny Cabral-Calderin

Number of open PhD positions: 1

Type of the PhD Study: Full-time PhD study only, four years

Project title: Breaking the Beat: Causal Mechanisms of Flexible Auditory Prediction

PhD Project description:

Natural sounds are rhythmic, but their timing is rarely perfectly stable. The brain must therefore decide when to synchronize with an auditory pattern and when to abandon an outdated prediction after the pattern changes. This PhD project will investigate the neural and causal mechanisms that support flexible auditory prediction. First, behavioral experiments and EEG will measure how rapidly listeners adapt when regular sounds become irregular or shift to a new temporal structure. Second, individualized transcranial alternating current stimulation (tACS) will test whether oscillatory synchronization causally facilitates or delays perceptual updating. Third, the project will examine whether these mechanisms generalize to more naturalistic signals such as speech and vocal interaction. The project combines psychophysics, EEG, non-invasive brain stimulation and computational analysis. It will distinguish neural tracking, causal influence and behavioral relevance, which are often treated as equivalent, and determine when synchronization is beneficial and when it becomes maladaptive. The findings will advance our understanding of how the brain uses temporal predictions to perceive and respond to changing environments.

Language requirements:

English: IELTS: 6,5 oder TOEFL: 95 ibt

Academic requirements:

Applicants should hold, or expect to obtain before the start of the doctorate, a Master's degree or equivalent qualification in neuroscience, psychology, biology, cognitive science, biomedical engineering, or a closely related discipline. A Bachelor's degree alone is not sufficient for this full-time doctorate.

Applicants should have a strong interest in human cognitive neuroscience and experimental research. Previous experience with at least one of the following would be advantageous: EEG, psychophysics, non-invasive brain stimulation, auditory perception, computational modelling, or advanced statistical analysis. Programming experience in MATLAB, Python, R, or a comparable environment is desirable. Applicants should be able to work independently, communicate effectively in English, and be motivated to develop experimental, analytical, and scientific-writing skills.

Information of the professor or research group leader (website, awards etc.):

Dr. Yuranny Cabral-Calderin is Assistant PI in the Human Neuroethology Unit of the Brain and Behavior Group at Freie Universität Berlin. Her research investigates the neural mechanisms of conscious perception, temporal prediction and neural oscillations, with a particular focus on EEG, rhythmic sensory stimulation and non-invasive brain stimulation.

She leads a DFG-funded research project on the oscillatory mechanisms of conscious perception. Her work has been published in journals including PLOS Biology, eLife, Journal of Neuroscience, Philosophical Transactions of the Royal Society B, NeuroImage and Human Brain Mapping. The research environment provides access to EEG, tACS, eye tracking and peripheral physiological recordings. The doctoral researcher will receive training in experimental design, quantitative data analysis, brain-stimulation methods, open science and scientific communication.

Website: https://ycabralcalderin.github.io
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Please note:
In a first step, the complete application should be uploaded to the online portal (https://fuberlin.moveon4.de/form/60acfece5d328710e40bdbd5/eng) for evaluation by January 15th, 2027.