PhD student/postdoc in Sensory and Behavioral Neuroscience

The labs of Julijana Gjorgjieva (Max Planck Institute for Brain Research, Frankfurt, Germany) and Ilona Grunwald Kadow at the TUM School of Life Sciences, Technical University of Munich, Germany invite applications for a fully-funded position (Postdoc or PhD student). We are looking for highly-motivated individuals with a strong quantitative background (in mathematics, physics, engineering, computer science, or related fields), experience in programming and data analysis, and a desire to develop cutting-edge experimental techniques. Previous background in neuroscience, imaging or behavioral analysis is a plus!

The project will examine the neural basis of need and effort-based decision-making in a collaboration between the Gjorgjieva lab, which develops theoretical models of neural circuit processing, and the Grunwald Kadow lab, which studies neural circuits underlying sensory processing and decision making in animal models.

The project aims to uncover circuit principles and behavioral readouts of motivation, persistence, and value perception as a function of internal state or experience (e.g. hunger). In particular, the Grunwald Kadow lab is collecting rich data sets of behavioral trajectories of single Drosophila flies as well as functional imaging data (i.e. multiphoton and light-sheet) of neuronal populations (e.g. modulatory neurons). The project will aim to develop advanced analysis techniques that extract key statistical features of the behavioral trajectories and imaging data, and build mathematical models that reproduce the data and make new predictions to be further tested experimentally. By combining behaviour, genetics and imaging, we will also develop neural circuit models that involve several brain areas, including sensory brain areas and higher cognitive regions of the fly brain (i.e. mushroom body).

References:
S. Sayin J. Gjorgjieva, I. C. Grunwald Kadow (2018). A neural circuit arbitrates between perseverance and reward in hungry Drosophila. BioRxiv doi.org/10.1101/259119
J. Gjorgjieva, G. Drion and E. Marder (2016). Computational implications of biophysical diversity and multiple timescales in neurons and synapses for circuit performance. Curr Opin Neurobiol 37:44-52.
Lewis L, Siju KP, Aso Y, Friedrich AB, Bulteel AJB, Rubin GM, Grunwald Kadow IC (2015). A higher brain circuit for immediate integration of conflicting sensory information in Drosophila. Current Biology PMID: 26299514, doi: 10.1016/j.cub.2015.07.015

Application:
The position will be based at the Technical University of Munich, with frequent visits to the Max Planck Institute for Brain Research in Frankfurt, two of the most exciting and international cities in Germany.

The application deadline has been extended to: April 15, 2018. Applicants will be considered until the position is filled. For further information please visit: http://www.cns.wzw.tum.de and http://www.neuro.wzw.tum.de or email gjorgjieva@brain.mpg.de and ilona.grunwald@tum.de.

To apply, please email the following to: neuro@wzw.tum.de (ref. GGK application)

1. A curriculum vitae
2. A letter of motivation explaining your scientific interests, your strengths when working on a problem, why us etc.
3. Contact details for 2 referees
4. A written sample of scientific research, e.g. a manuscript, thesis, or code etc.

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