

Bielefeld University, Neurobiology & Center of Excellence Cognitive Interaction Technology

PhD or PostDoc position - visual navigation in bumblebees

Application deadline: not specified

Doctoral position or Postdoctoral position in the field of insect visually guided behaviour

Project

Learning strategies and visual information used for localising a goal in bumblebee navigation: A combined behavioural, neural and modelling analysis

Funded by Deutsche Forschungsgemeinschaft (DFG)

What do we expect?

We are seeking a highly-motivated candidate who strives for understanding the mechanisms underlying the processing of spatial information by bumblebees in the context visual navigation. Quantitative behavioural analysis targeting the neural basis of the behaviour define the field of activity. Particular emphasis will be laid on the coordination of head and body movements while the animal performs learning and search flights in the vicinity of its goal.

You are expected to work together with other researchers focusing on behavioural and modelling approaches and to actively contribute own ideas. You are an ideal candidate, if you are experienced in doing experimental analyses on insects, in data analysis, in programming (preferably Matlab), and have excellent writing skills. However, even if you match this profile only in parts, you are encouraged to apply - given you are prepared to develop new skills, learn new techniques and are eager to contribute interesting research results to the field of navigation of bees.

What do we offer?

We offer a position in a research team working in a stimulating environment with excellent facilities for laboratory work as well as computational analyses (e.g. high-speed video techniques, virtual reality arenas for behavioural and neurophysiological experiments, and innovative approaches to data analysis). The Neurobiology group is cooperating with other groups at the Center of Cognitive Interaction Technology (CITEC) in Bielefeld, but also internationally.

What is the project background?

Bumblebees use visual memories to locate their nests and/or food sites. They return repeatedly to these places in the course of the day, seldom missing their goal. Navigation takes place on a wide range of spatial scales: on a scale within the foraging range of the animal (i.e. within hundreds of metres and even kilometres; [UTF-8?]– global [UTF-8?]navigation–) as well as on a small scale (i.e. within few metres) when it comes to pinpointing the precise location of the goal [UTF-8?](– local [UTF-8?]navigation–). Although it is known for long that visual information plays a dominant role for locating a virtually invisible goal during local navigation and that this information is acquired by active learning strategies, it is still controversial which environmental features are stored during learning and later used for finding the goal. To understand the mechanisms underlying local navigation the project focusses on one particularly relevant key question: What information is learnt and used for goal localisation during local navigation and how is this information tied to the spatio-temporal organisation of learning and subsequent homing behaviour? This question can only be answered if the precise coordination of the complex movements of the head (which carries the eyes) and of the body (which carries the flight machinery) is understood. Only then can we reconstruct what the animals have seen during their flight manoeuvres.

Where to apply?

For further inquiries about the project, please contact: Prof. Dr. Martin Egelhaaf, Neurobiology & CITEC, Bielefeld University; martin.egelhaaf@uni-bielefeld.de . Please send your application including a letter outlining your academic education and past research, your motivation for this position and your specific experience (max. 2 pages), CV, list of publications (if available) and contact details of 2-3 referees in a single (!) PDF file to Prof. Dr. Martin Egelhaaf, Neurobiology & CITEC, Bielefeld University; martin.egelhaaf@uni-bielefeld.de

Applications will be considered until the position is filled.