MAX-PLANCK-INSTITUT
FÜR KOGNITIONS- UND NEUROWISSENSCHAFTEN

Call for applications

Master's students (m/f/d)

Master's thesis on neuro-robotics and self-localization

GENERAL BACKGROUND

The **Research Group Neural Computation (Dr Andrej Bicanski)** explores the neural basis of spatial and episodic memory, navigation, and cognitive maps more broadly. Specifically, we are interested in the neural computations underlying these and related mental faculties, how they vary across species, and how they change in aging and disease. We mainly explore these topics through mechanistic computational models of the circuits underlying these cognitive faculties. We also apply these models in a robotics context.

PROJECT-SPECIFIC BACKGROUND

We are looking for a Master thesis student (2026/2027 and/or 2027/2028) to work on neuro-robotics projects, on ground truth self-localization in natural environments and linking computational models of spatial memory and navigation to neuromorphic hardware and a robotic platform.

RELEVANT READING

Hines, A. D., Milford, M., & Fischer, T. (2025). A compact neuromorphic system for ultra–energy-efficient, on-device robot localization. Science Robotics, 10(103), eads3968.

Yu, F., Wu, Y., Ma, S., Xu, M., Li, H., Qu, H., ... & Shi, L. (2023). Brain-inspired multimodal hybrid neural network for robot place recognition. Science Robotics, 8(78), eabm6996.

Olson, E. (2011, May). AprilTag: A robust and flexible visual fiducial system. In 2011 IEEE international conference on robotics and automation (pp. 3400–3407). IEEE.

WHAT WE EXPECT FROM YOU

- Willingness to learn and to accept feedback
- Presence in the group when possible
- High motivation, reliability, initiative and rigor

WE ARE LOOKING FOR

- Good interpersonal skills
- A strong programming background in Python or Matlab
- Analytical skills acquired in subjects like Physics, Mathematics or Engineering are an asset.
- Prior knowledge/experience with robotics is a strong asset
- Good command of English

WHAT WE OFFER

- Chance to gain experience in an internationally-recognized research group
- Close supervision in a research-focused environment
- Opportunity to work on current research topics
- Training in robotics and computational modelling

HOW TO APPLY

Send your application including a CV and a motivational statement to **Andrej Bicanski**: **bicanski@cbs.mpg.de**

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