

Computational Postdoctoral Position: Uncovering the Mathematics of Predictive Pursuit

About the position

We are seeking an enthusiastic and highly motivated Postdoctoral Fellow with a quantitative PhD and background in machine learning, dynamical systems, physics, engineering or related fields for a 3-4 year project investigating the computational principles of Predictive Pursuit in freely moving rodents. This project is an interdisciplinary collaboration between the labs of Jonathan Whitlock at the Kavli Institute for Systems Neuroscience (NTNU, Trondheim, Norway) and Alex Cayco-Gajic at the Group of Neural Theory in Ecole Normale Supérieure (ENS-PSL, Paris, France). The candidate will be physically based in Trondheim, with extensive opportunities for research visits to Paris.

About the project

The project aims to uncover how the brain anticipates and reacts to dynamically fleeing agents and to perceptual mismatch.

We will use the head and body of freely moving rodents as physical readouts of internal planning, dynamic decision-making and perceptual processing, combining high-resolution motion capture and high-density neural recordings across a range of behavioral conditions.

The successful candidate will lead the data-driven modeling effort, developing state-of-the-art statistical models combining machine learning and dynamical systems to infer changes in strategy from high-dimensional behavioral data. The project is highly collaborative, with modeling developed in partnership with the lab of Alex Cayco-Gajic in Paris, while working closely with behavioral neurophysiologists at the Kavli Institute in Trondheim.

Duties of the position

- Develop machine-learning and dynamical-systems approaches for analyzing high-dimensional behavioral data.
- Model postural, movement and performance dynamics to identify behavioral states and pursuit strategies.
- Carry out high-quality, independent research within the project framework.
- Publish findings in high-impact academic journals and present at international conferences.
- Participate actively in collaborations and in the intellectual life of the research group

Required selection criteria

- A PhD in a quantitative field, such as physics, computational neuroscience, computer science, or engineering
- Strong expertise in machine learning, dynamical systems, computational modeling or quantitative analysis
- Demonstrated experience analyzing large, high-dimensional datasets, preferably including behavioral, video or neurophysiological
- Publish findings in high-impact academic journals and present at international conferences.
- Participate actively in collaborations and in the intellectual life of the research group and institute.
- Documented experience with scientific programming, e.g. Python, MATLAB or related languages.
- A strong academic record and documented research productivity.
- Excellent oral and written communication skills in English.
- Ability to work both independently and collaboratively in an interdisciplinary research environment.

Interested?

Apply through the job ad portal: nettskiema.no/a/655482

Questions? Jonathan Whitlock: jonathan.whitlock@ntnu.no | Alex Cayco-Gajic: natasha.cayco.gajic@ens.psl.eu

Labs: www.whitlocklab.org | caycogajiclab.github.io