Faculty of Physics and Earth Sciences
Peter Debye Institute for Soft Matter Physics
Prof. Dr. Frank Cichos

UNIVERSITÄT LEIPZIG

Department Molecular Nanophotonics, Linnéstraße 5, 04103 Leipzig, Germany

PhD Position available
"Control of Active Particles with Multi-Agent Deep Reinforcement Learning"

A PhD position within the competence center SCADS.AI is available to work under the supervision of Prof. Dr. Frank Cichos at the department Molecular Nanophotonics on the optical control of active-particle swarms by multi-agent deep reinforcement learning techniques. The Molecular Nanophotonics Groups is one of the leading groups in the field of feedback-controlled active particles merging also machine learning processes with real world actuation of microscopic particles.

We are seeking a highly motivated PhD candidate with a very good Master's degree in Physics or Computer Science with excellent English proficiency. The successful candidate will perform cutting edge experimental research on the control of active particles by means of deep reinforcement learning to study the emergence of new function collective states. The candidate should be committed to collaborative and interdisciplinary work, and have excellent oral and written communication skills (records of creative and independent scientific research and active participation in its dissemination in peer-reviewed journals are welcome).

The experimental work will allow the successful applicant to acquire expert skills and knowledge on innovative micro-optical multi-particle manipulation and detection techniques as well as on machine learning algorithms applied to active particle detection and control. Experience with modern optical microscopy, image and time-series analysis, which will be employed to control and study active-particle swarms and microscopic thermodynamic machines, would be useful. Active participation in the competence network SCADS.AI is expected.

The working language is English.

Applications including 1) a letter of interest (max. 1 page), clearly stating the specific motivation of the candidate to join the group, work on this project, career goals, etc., 2) a CV, 3) grade transcripts or equivalent record of excellent academic performance, clearly indicating courses taken and grades in each course (for MS and BS), 4) the names of at least two consenting referees should be sent to cichos@physik.uni-leipzig.de. The application deadline is **January 3, 2022**.

Please visit our group website for more details about our research:
https://www.uni-leipzig.de/~mona