




Academic staff

PhD Position in Computer Science and Robotics

(full-time, E 13 TV-L)

Reference Number 2023/324. The start date is as soon as possible, ideally on the first months of 2024. The position is limited until 31/12/2026. A contract extension to a maximum of four years in total is desired and is subject to the continued funding of the cluster. In principle, this position can be divided into two half-time positions.

The University of Konstanz is one of eleven Universities of Excellence in Germany. Since 2007 it has been successful in the German Excellence Initiative and its follow-up programme, the Excellence Strategy.

We are the **Centre for the Advanced Study of Collective Behaviour (CASCB)**, one of the German **Clusters of Excellence**. Being a cooperation between the University of Konstanz and the Max Planck Institute of Animal Behavior, CASCB is an interdisciplinary environment for the study of collective behaviour in animals and robots that is unique worldwide as it combines researchers from several disciplines, including biology, physics, computer science, neuroscience, and psychology. For more information on the CASCB Cluster and its community, please visit: <https://www.exc.uni-konstanz.de/collective-behaviour/>

The successful applicant will join the research group led by Dr Andreagiovanni Reina. Using **mathematical and computational modelling** (with tools from statistical physics, network science, and multiagent simulation), our group advances the understanding of how groups of individuals—e.g. animals, cells, or robots—coordinate their actions and collectively process information. The generated models and understanding are then used to design and implement algorithms of collective behaviour for **large-scale robotics systems** that operate without a central leader, such as robot swarms. More info on <https://giovannireina.com>.

The PhD project will be tailored to the student's skills and interests, there is the possibility of conducting research based more on **theoretical mathematical modelling** or more oriented towards **multiagent simulations** and **collective robotics experiments**. As a member of our team, you will have the opportunity to contribute to modern research in robotics, to work in one of the best research environments worldwide for collective behaviour, and to be part of a young and vibrant research community.

Your responsibilities

- Research in the field of large-scale mobile multi-robot systems and collective behaviour
- Problem solving, creative thinking
- Acquiring new skills and knowledge in line with advances in the relevant subject area
- Communicating your results by publishing research papers in journals and conferences
- Representing the team's work to external partners, the scientific community, and the general public
- Developing creative approaches to problem solving with an appreciation of longer-term implications
- Assist in supervising MSc students

Your Competencies

- MSc degree in Computer Science, Robotics, Physics, or a relevant field
- Good programming skills and experience of implementing and analysing numerical simulations
- Knowledge of probability and statistics
- Interest in modelling collective behaviour and working on an interdisciplinary project
- (Optional/desirable) experience in programming robots, modelling collective behaviour, nonlinear dynamical systems, opinion dynamics, complex systems, network science, or game theory
- Strong written and oral communications skills in English
- Strong motivation and determination
- Good teamwork skills

We Offer

- Supervision on the research project, excellent development opportunities, and mentoring
- A competitive salary
- Access to advanced infrastructure for collective robotics, e.g. imaging hangar
- A very stimulating international environment for research in collective behaviour
- Opportunities for collaborations with world-leading researchers at the Max Planck Institute of Animal Behavior in Konstanz and international institutions
- Professional infrastructure and student support
- A family-friendly university and work environment that values and promotes diversity and equal opportunities

Questions can be directed to Dr. Andreagiovanni Reina via e-mail: andreagiovanni.reina@uni-konstanz.de.

We look forward to receiving your application, consisting of a cover letter, curriculum vitae, copies of degrees, a copy of your MSc thesis, and (possible) list of publications. This position is available until filled. For full consideration, please submit your application by **Januray 31st, 2024** via our **Online application portal**:

<https://stellen.uni-konstanz.de/en/jobposting/0fb4063cab05b84dc739690e645e855c9973354b0/apply>

The University of Konstanz is committed to ensuring an environment that provides equal opportunities and promotes diversity as well as a good balance between university and family life. As an equal opportunity employer, we strive to increase the number of women working in research and teaching. We also support working couples through our dual career programme. Persons with disabilities are explicitly encouraged to apply. They will be given preference if appropriately qualified (contact svb@uni-konstanz.de, + 49 7531 88-4016).