

SUPSI

Researcher (post doc) in robotic swarms and ant-based networking

The University of Applied Sciences and Arts of Southern Switzerland has opened one position in the Department of Innovative Technologies (DTI) at Dalle Molle Institute for Artificial Intelligence (IDSIA), in Manno (by Lugano, Switzerland), for a Researcher (post doc) in robotic swarms and ant-based networking at 100%, for one year, starting October 2011.

Mission

The objective of the research is to fill the gap and to work out the cross-fertilization of ideas and methods between swarm robotics and ant-based approaches for adaptive routing and control of mobile ad hoc networks.

While so far in swarm robotics the notion of pure locality of interactions and communications has played a central role shaping the design and the behaviour of these systems, the use of efficient, adaptive, and scalable techniques for longer range data routing and information dissemination, such as ant-based ones, can play a major role to boost-up the performance of swarm robotics systems and significantly expand their possible domains of application.

The applicant will port and adapt to robotic swarms methods developed during the last two decades in the field of ant-based routing and control of mobile ad hoc networks, and will research novel methods to close the loop between communication and control in robotic swarms: efficient communications will support and direct distributed control and, viceversa, controlled and coordinated robot mobility will enhance and made possible reliable and intensive data communications and robot interactions.

The investigated topics will be a follow-up of IDSIA's previous and current research in the domains of swarm robotics (the EU-funded projects Swarmanoid and Swarm-bots, and the Swiss-funded projects NCCR (sub-project 4.5) and SWARMIX), and of ant-inspired routing in mobile ad hoc networks (EU-funded project BISON).

Candidate profile

We are looking for an excellent and highly motivated candidate with a strong interest and scientific background in: ant-based networking, robotics, swarm intelligence, and machine learning. In particular, the candidate must have a proven experience in: ant-routing algorithms for mobile ad hoc networks, distributed algorithms for the behavioral control of swarm intelligence and swarm robotic systems, use of open source network simulators (e.g., NS2), application of statistical analysis and learning techniques. She/he is expected to have good mathematical skills and programming skills, and to have a positive attitude toward interdisciplinary research and teamwork. Knowledge of the Swiss university system and of the swiss national languages will be favorably considered.

The candidate must already have obtained a Ph.D. degree.

Time frame, Enrollment, and Salary information

- Expected duration of the fellowship: 1 year, starting from October 2011
- English is the official language at IDSIA.
- The candidate will work under the direct supervision of Prof. Luca Gambardella and Dr. Gianni Di Caro.

- The gross salary is roughly 74,000 CHF per year (negotiable based on candidate's experience). There is travel funding in case of papers accepted at conferences and for project meetings.

Research environment

IDSIA (<http://www.idsia.ch>) is a research institute affiliated to the University of Lugano (<http://www.usi.ch/en/index.htm>) and the University of Applied Sciences of Southern Switzerland (http://www.supsi.ch/home_en.html).

IDSIA is a truly international, stimulating, and dynamic environment. It currently hosts about 50 people, including senior researchers, postdoctoral fellows, and Ph.D. students. The research activities carried out at IDSIA address a number of different domains, including: swarm robotics, networking, machine learning, combinatorial optimization, bio-inspired computing, data mining, information theory, complex systems, and simulation.

Contact

Regulations for the employees are published (in Italian) in "Direttive interne SUPSI" (direttiva 7A, art. 2) and in "Regolamento del personale della SUPSI" see web site www.supsi.ch (then follow the link, Documenti ufficiali). In case you need further information about this position please contact:

Dr. Gianni Di Caro

gianni.dicaro@supsi.ch

How to Apply

The letter of application must have attached:

- Detailed curriculum vitae
- List of two references including their e-mail addresses (no reference letters are needed)
- Cover letter describing the background and the research interests of the candidate, pointing out their relationship with the topics of the project (max 1 page)
- School certificates
- Links to Ph.D. thesis and publications

The application **deadline is September 9, 2011** (the postal stamp date will hold). Applications must be sent to the following address:

SUPSI – Direzione

Le Gerre, CH-6928 Manno

(please indicate the position for which you are applying: **ric IDSIA-Fellowship in Networked Swarms**)

Incomplete or late applications will be withdrawn.