Postdoc in Hybrid Control of Multi-Robot Systems, Royal Institute of Technology, Sweden.

Kungliga Tekniska högskolan,

KTH Royal Institute of Technology in Stockholm has grown to become one of Europe’s leading technical and engineering universities, as well as a key centre of intellectual talent and innovation. We are Sweden’s largest technical research and learning institution and home to students, researchers and faculty from around the world. Our research and education covers a wide area including natural sciences and all branches of engineering, as well as architecture, industrial management, urban planning, history and philosophy.

The Division of Decision and Control Systems at the School of Electrical Engineering and Computer Science of KTH conducts research in networked control systems, robotics, control of communication systems, systems biology and system identification. Much of the research is conducted within EU projects, as well as within the inter-departmental centers CAS and ACCESS Linnaeus Centre. The group has also strong financial support from the Swedish Foundation for Strategic Research, the Knut och Alice Wallenberg Foundation and the Swedish Research Council.

Job description

We invite applications for up to two postdoctoral research positions in the general field of hybrid control for robotic systems. The successful candidates will join a research group that is focusing on new control design methodologies for hybrid systems combining tools from control theory, reinforcement learning and formal verification methodologies from computer science. The position is associated with the following sub-topics:

- **Distributed control synthesis from temporal logic specifications**: develop control design tools for multi-agent systems to fulfill specifications given as temporal logic formulas from formal verification. In order to combine distributed control with formal methods, discrete abstractions of the distributed multi-agent system should be derived and agent dependencies should be accounted for.

- **Human-in-the-loop robot control**: A hybrid systems approach to the problem is considered where the human provides logical specifications to the robotic system that are translated to continuous control commands. The interaction is bidirectional in the sense that the human should update the input specification and the robotic system should adapt its feedback control in a real-time manner using reinforcement learning approaches.

- **Multi-robot coordination and manipulation**: develop control and task planning methodologies for heterogeneous multi-robot systems with different motion and manipulation capabilities. The robots may have different dynamics, state and input constraints and might or might not be equipped with manipulators for grasping and transportation objectives.

It is expected that the successful candidates will conduct research in the aforementioned research area, interact with doctoral and master students, and be involved in collaborative work in national and international projects. The position is associated to the NTU-WASP joint project Scalable Multi-Robot Sensor Fusion, Localization, Navigation, and Control, as well as the SSF Smart System project COIN, related to the topics discussed above.
**Qualifications**

Requirements

- A doctoral degree or an equivalent foreign degree, obtained within the last three years prior to the application deadline. Candidates should have a doctoral degree related to at least one of the following research areas:
  - hybrid control systems
  - distributed multi-robot control
  - formal methods for robot control synthesis
  - learning-based multi-robot control.

The successful applicants should have an outstanding research and publication record. Well-developed analytical and problem solving skills are a requirement. We are looking for strongly motivated persons, who are able to work independently, as well as within a research group. Excellent command of English orally and in writing is required.

In addition, previous participation in EU project research and management, proposal writing skills, as well as experience with real robotic platforms will be considered a merit. Great emphasis will be placed on personal competence and suitability.

Preferred qualifications

- Research expertise
- Educational ability
- Awareness of diversity and equal treatment issues with a particular focus on gender equality
- Teamwork
- Independence

**Trade union representatives**

You will find contact information to trade union representatives at KTH's webpage.

**Application**

Log into KTH's recruitment system in order to apply to this position. You are the main responsible to ensure that your application is complete according to the ad.

Your complete application must be received at KTH no later than the last day of application, midnight CET/CEST (Central European Time/Central European Summer Time).

Temporary employment for one year, and at the most up to two years.

**About the employment**

A position as a postdoctoral fellow is a time-limited qualified appointment focusing mainly on research, intended as a first career step after a dissertation.

**Others**

Gender equality, diversity and zero tolerance against discrimination and harassment are important aspects of KTH's work with quality as well as core values in our organization.

For information about processing of personal data in the recruitment process please read here.

We firmly decline all contact with staffing and recruitment agencies and job ad salespersons.

Disclaimer: In case of discrepancy between the Swedish original and the English translation of the job announcement, the Swedish version takes precedence.
Type of employment Temporary position longer than 6 months
Contract type Full time
First day of employment Preferably as soon as possible, or according to agreement
Salary Monthly
Number of positions 1
Working hours 100%
City Stockholm
County Stockholms län
Country Sweden
Reference number J-2020-0273
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