



The Cognitive Robotics department at Delft University of Technology, The Netherlands, announce a vacancy for one *Postdoctoral Researcher*

Multi-robot Motion Planning and Task Assignment

Job description

Gradually maturing robotic technology will enable large-scale deployments of highly-automated systems for logistics. Fleets of autonomous mobile robots can be leveraged to make industrial intralogistics more flexible and more efficient and fleets of automated on-demand vehicles can disrupt urban commerce by providing last-mile deliveries faster and cheaper than what is possible using traditional delivery channels. In this project, we will develop methods that allow to make principled decisions about design parameters of large-scale multi-robot systems, and to control the vehicles in the system, such that the desired trade-off between the fleet composition, operation cost, and system performance is achieved.

Our goal is to design a general and scalable method for multi-robot multi-task assignment and planning that integrates motion planning and task assignment. The method shall address the following challenges: i) account for multiple objectives and trade-offs between cost of operation and system performance, ii) do predictive planning and assignment based on probabilistic models of the future, iii) adapt online to changes and uncertainties, for example by learning some parameters of the system. We may build upon our recent work on ridesharing and extend the methods for more general robotic systems.

This project is supported in part by an Amazon Research Award “Predictive Multi-objective Fleet Routing and Assignment”. Cross collaborations also exist with the Amsterdam Institute for Advanced Metropolitan Solutions and other researchers from the TU Delft Robotics Institute and the TU Delft Transportation Institute. For a glimpse of our research see <http://www.alonsomora.com/research.html>

Requirements

The candidate has (or is close to complete) a PhD degree in robotics, systems and control, applied mathematics, optimization, artificial intelligence, machine learning, computer science, or a related field. The candidate shall have strong analytical and mathematic skills (preferably in motion planning or task assignment for multi-robot systems). Experience in machine learning is not required but it is beneficial. A very good command of the English language is required, as well as excellent communication skills and several publications in Q1 venues related to the field of research.

Conditions of employment

TU Delft offers a customisable compensation package, a discount for health insurance and sport memberships, and a monthly work costs contribution. Flexible work schedules can be arranged. An International Children’s Centre offers childcare and an international primary school. Dual Career Services offers support to accompanying partners. Salary and benefits are in accordance with the Collective Labour Agreement for Dutch Universities. Contract duration 2 years.

Employer

You will be part of the *Autonomous Multi-Robots Lab* (<https://www.alonsomora.com>), within the *Cognitive Robotics department*. The main focus of the *Cognitive Robotics department* is the development of intelligent robots and vehicles that will advance mobility, productivity and quality of life. Our mission is to bring robotic solutions to human-inhabited environments, focusing on research in the areas of machine perception, motion planning and control, machine learning, automatic control and physical interaction of intelligent machines with humans. We combine fundamental research with work on physical demonstrators in areas such as self-driving vehicles, collaborative industrial robots, mobile manipulators and haptic interfaces. Strong collaborations exist with cross-faculty institutes TU Delft Robotics Institute and TU Delft Transport Institute), our national robotic ecosystem (RoboValley, Holland Robotics) and international industry and academia. <http://www.cor.tudelft.nl/>

Additional information

If you have specific questions about this position, please contact Prof. Javier Alonso-Mora, e-mail: J.AlonsoMora@tudelft.nl. Please do not send application emails here, but use the specified address below.

To apply, please submit:

- a letter of motivation explaining why you are the right candidate for this project,
- a detailed CV with a complete publication list,
- a copy of your top two publications,

- the names and contact addresses of two or three references.

All these items should be combined in one PDF document. Applications should be submitted by email at the earliest convenience to application-3mE@tudelft.nl. When applying for this position, please refer to vacancy number **3mE19-12**. The review of applications will start on March 15th 2019 and continue until the position is filled. The starting date is negotiable. If you are interested in more than one position in the Autonomous Multi-robots Lab, please submit a single application and indicate that in your letter of motivation.

Link to application website: www.academictransfer.com/52827