



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

Multi-robot Motion Planning for Scene Understanding

Job description

Obtaining accurate and comprehensive information from a complex scene is one of the most important and relevant problems in robotics. Yet extremely challenging. When robots are deployed in dynamic environments, they need to be aware of their surroundings to discern friend from foe, or to separate important events that require their immediate attention from those secondary and non-essential. Compared to a single robot acting individually, the optimal combination of information gathered by several robots can yield much better results. Especially, when robots are equipped with different sensors and they acquire information from different perspectives at the same time.

Our goal is to develop novel **motion planning and coordination methods for distributed information gathering and high-level scene reasoning with a large team of heterogeneous robots equipped with limited sensing and communication capabilities**. Our algorithms will compute optimal decisions, in terms of movement, data acquisition and communication between the robots to keep the scene information as accurate and homogeneous as possible among the fleet. Machine learning might be combined with optimization and control methods to perform these actions using only local onboard sensing and limited communications with nearby robots.

This vacancy is part of the program “Distributed high-level scene reasoning with teams of heterogeneous robots”, which is funded by the Office of Naval Research Global (ONRG). Collaboration with our partners in the project, namely Prof. E. Montijano (U. Zaragoza), Prof. M. Schwager (Stanford) and Prof. D. Rus (MIT) is expected. Cross collaborations also exist with the Amsterdam Institute for Advanced Metropolitan Solutions and other researchers from the TU Delft Robotics Institute. For a glimpse of our research see <http://www.alonsomora.com/research.html>.

Requirements

The candidate has a very good MSc degree in robotics, systems and control, applied mathematics, artificial intelligence, machine learning, mechanical/electrical engineering, computer science, or a related field. The candidate must have strong analytical skills and must be able to work at the intersection of several research domains. A very good command of the English language is required, as well as excellent communication skills. Candidates having exhibited their ability to perform research in robotics, or in probabilistic planning and decision-making, are especially encouraged to apply.

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.

As a PhD candidate you will be enrolled in the TU Delft Graduate School. TU Delft Graduate School provides an inspiring research environment; an excellent team of supervisors, academic staff and a mentor; and a Doctoral Education Programme aimed at developing your transferable, discipline-related and research skills. Please visit <http://www.tudelft.nl/phd> for more information.

Contract: Temporary, 4 years. Salary: €2266 - €2897 per month gross + 8% holiday allowance and 8.3% year-end bonus.

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,
- a complete record of Bachelor and Master courses (including grades),
- your Master's Thesis (at least as draft),
- any publications, and a list of projects you have worked on with brief descriptions of your contributions (max 2 pages), and
- 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 **3mE19-13**. 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/52828