

Safe and socially intuitive navigation for teams of mobile robots in urban environments

We offer a PhD position at the Autonomous Multi-Robots Lab of the Delft University of Technology. Our main research interest is in navigation, motion planning and control of autonomous mobile robots, with a special emphasis in multi-robot systems and robots that interact with other robots and humans. We contribute novel methods and solutions in the areas of collision avoidance, motion planning, formation control, vehicle routing, task assignment, aerial videography and human-swarm interaction. Building towards the smart cities of the future, we apply these techniques in various fields, including autonomous cars, automated factories, aerial vehicles and intelligent transportation systems.

For autonomous robots, safe and socially intuitive navigation is critical when moving among other robots and humans. Think of the challenges that a bicyclist faces when navigating through busy streets. Yet, current methods for navigation and autonomous driving are typically limited to relatively low speeds or clutter-free environments with very few moving obstacles and little interaction. The goal of this project is to develop novel methods for motion planning and multi-robot coordination that grant high performance and demonstrate safe motion through changing, dynamic and crowded urban environments. Tools from constrained optimization, distributed consensus and machine learning will be employed, and a tight integration with perception is expected. Tests will be performed with autonomous boats and/or automated cars navigating in urban environments.

The main external collaborators in this project are the Massachusetts Institute of Technology (Roboat project), the Amsterdam Institute for Advanced Metropolitan Solutions and Waternet.

-- Requirements:

- A MSc degree in Computer Science, Mechanical Engineering, Electrical Engineering, Applied Mathematics or a related field to Robotics.
- Strong interest in performing cutting-edge research in autonomous navigation and multi-robot coordination.
- Excellent academic record.
- Strong analytical, mathematical and programming (C/C++) skills
- Very good command of spoken and written English.
- Experience with robotic hardware, autonomous navigation, motion planning, constrained optimization or machine learning is a plus.

-- Conditions of employment

We offer a four-year PhD research contract at the Cognitive Robotics department of the Delft University of Technology, which includes a contribution towards pension and social security. Salary and benefits are in accordance with the Collective Labor Agreement for Dutch Universities.

-- Information and application:

The Delft University of Technology is constantly ranked among the best universities in Engineering (World top 20 in THE and QS rankings). Information about our research can be found at <http://www.dcsc.tudelft.nl/~jalonsomora/>

To apply send your application to Dr. Javier Alonso-Mora (Assist. Prof.) j.alonsomora@tudelft.nl. Include your CV with publication list, the transcript of records from your BSc/MSc, a motivation letter stating your interest in the project and relevant experience, and two or three references / recommendation letters.