PhD Position Sensor Fusion for Indoor Localisation using the Magnetic Field

Job description

Indoor localisation is a much sought-after goal as it has numerous applications in connection to location-based services, Internet of things, security and emergencies. Since buildings block GPS signals, there is not yet a generally available method for indoor localisation.

This PhD project focuses on the fundamental research that is needed to develop a new method for indoor localisation that uses the strongly position-dependent indoor magnetic field as a source of position information. The ambition in this project is to develop a method for indoor localisation that can be used directly when entering any building using sensors present in any modern smartphone. More specifically, the focus is on only using inertial sensors and magnetometers for localisation. To achieve this goal, focus will be on developing new algorithms at the intersection of the two research fields of sensor fusion and machine learning. More specifically, focus will mostly be on Gaussian processes, particle filtering and the combination thereof.

The successful candidate will conduct both algorithmic as well as experimental research in the field of sensor fusion for indoor localisation using the magnetic field.

We offer the opportunity to perform scientifically challenging research in a multidisciplinary research group, and to collaborate with academic and industrial partners. The PhD student will also be able to participate in the research school DISC.

The department Delft Center for Systems and Control (DCSC) of the faculty Mechanical, Maritime and Materials Engineering, coordinates the education and research activities in systems and control at Delft University of Technology. The Centers' research mission is to conduct fundamental research in systems dynamics and control, involving dynamic modelling, advanced control theory, optimisation and signal analysis. The research is motivated by advanced technology development in physical imaging systems, renewable energy, robotics and transportation systems.

Requirements

We are looking for a talented, outstanding candidate with an M.Sc. degree (or close to completion) in Systems and Control, Electrical or Mechanical Engineering, Computer
Science or a related field. The candidate should demonstrate a strong background and/or interest in Sensor Fusion, Machine Learning, Data Science, Gaussian Processes, Optimisation and Particle Filtering. The candidate must be enthusiastic and greatly interested in fundamental research in addition to having good programming skills, e.g. in Matlab or Python, for implementing state-of-the-art advanced algorithms. In addition, excellent written and oral communication skills in English are important for this position (Dutch not required).

Conditions of employment

TU Delft offers PhD-candidates a 4-year contract, with an official go/no go progress assessment after one year. Salary and benefits are in accordance with the Collective Labour Agreement for Dutch Universities, increasing from € 2395 per month in the first year to € 3061 in the fourth year. As a PhD candidate you will be enrolled in the TU Delft Graduate School. The TU Delft Graduate School provides an inspiring research environment with an excellent team of supervisors, academic staff and a mentor. The Doctoral Education Programme is aimed at developing your transferable, discipline-related and research skills.

The TU Delft offers a customisable compensation package, discounts on health insurance and sport memberships, and a monthly work costs contribution. Flexible work schedules can be arranged. For international applicants we offer the Coming to Delft Service and Partner Career Advice to assist you with your relocation.

TU Delft (Delft University of Technology)

Delft University of Technology is built on strong foundations. As creators of the world-famous Dutch waterworks and pioneers in biotech, TU Delft is a top international university combining science, engineering and design. It delivers world class results in education, research and innovation to address challenges in the areas of energy, climate, mobility, health and digital society. For generations, our engineers have proven to be entrepreneurial problem-solvers, both in business and in a social context. At TU Delft we embrace diversity and aim to be as inclusive as possible (see our Code of Conduct). Together, we imagine, invent and create solutions using technology to have a positive impact on a global scale.

Challenge. Change. Impact!

Faculty Mechanical, Maritime and Materials Engineering

The Faculty of 3mE carries out pioneering research, leading to new fundamental insights and challenging applications in the field of mechanical engineering. From large-scale energy storage, medical instruments, control technology and robotics to smart materials, nanoscale structures and autonomous ships. The foundations and results of this research are reflected in outstanding, contemporary education, inspiring students and PhD candidates to become socially engaged and responsible engineers and scientists. The faculty of 3mE is a dynamic and innovative faculty with an international scope and high-tech lab facilities. Research and education focus on the design,
manufacture, application and modification of products, materials, processes and mechanical devices, contributing to the development and growth of a sustainable society, as well as prosperity and welfare.

Click here to go to the website of the Faculty of Mechanical, Maritime and Materials Engineering. Do you want to experience working at our faculty? This video will introduce you to some of our researchers and their work.

Additional information

For information about this vacancy, you can contact Manon Kok, Assistant Professor, email: m.kok-1@tudelft.nl, tel.: +31 (0)15 2781529.

For information about the selection procedure, please contact Irina Bruckner, HR advisor, email: application-3mE@tudelft.nl.

Application procedure

To apply, please submit by 31 December 2020:

- curriculum vitae;
- statement of motivation and research interests (up to one page);
- transcripts of all exams taken and obtained degrees (in English);
- names and contact information of up to three references (e.g. project/thesis supervisors);
- up to 3 research-oriented documents (e.g. thesis, conference/journal publication).

A pre-employment screening can be part of the application procedure.