

PhD Position in Robustness and Control of Probabilistic Machine Learning Models

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Challenge: Ensure the safety of the decisions of data-driven systems

Change: Quantify the uncertainty in machine learning models and use it to make safe decisions

Impact: Produce AI systems that are provably beneficial to society

Job description

TU Delft is a top tier university and is exceedingly active in the field of Artificial intelligence and Control Systems. The HERALD lab is devoted to the development of novel computational frameworks to enable AI-based systems to safely and robustly interact with the humans and the uncertain environment around them. Our long-term ambition is to lay a foundation for the development of future autonomous systems that can reliably and beneficially interact with humans.

On this PhD project you will investigate the combination of probabilistic methods and formal methods from computer science and control theory to devise solutions to problems in the context of data-driven control systems. In particular, the project will shift towards Bayesian (deep) models for enabling probabilistic reasoning over the correctness of AI based control systems.

You will work at the Delft Centre of Systems and Control (DCSC) and will be supervised by Luca Laurenti.

The Delft Centre for Systems and Control (DCSC) coordinates the education and research activities in systems and control at Delft University of Technology. The Centre's 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, robotics and transportation systems. The group actively participates in the Dutch Institute of Systems and Control (DISC).

Requirements

An MSc degree in systems and control, applied mathematics, electrical engineering, computer science, or related fields.

- Basic knowledge of control theory, probability theory, and/or machine learning (waived if the candidate is particularly skilled on theoretical computer science or optimization).
- Strong analytical skills and an ability to work at the intersection of several research domains, in particular control theory and computer science.
- Basic programming skills are expected.
- Good command of the English language and good communication skills.

Doing a PhD at TU Delft requires English proficiency at a certain level to ensure that the candidate is able to communicate and interact well, participate in English-taught Doctoral Education courses, and write scientific articles and a final thesis. For more details please check the [Graduate Schools Admission Requirements](#).

Conditions of employment

Doctoral candidates will be offered a 4-year period of employment in principle, but in the form of 2 employment contracts. An initial 1,5 year contract with an official go/no go progress assessment within 15 months. Followed by an additional contract for the remaining 2,5 years assuming everything goes well and performance requirements are met.

Salary and benefits are in accordance with the Collective Labour Agreement for Dutch Universities, increasing from € 2541 per month in the first year to € 3247 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, TU Delft has the [Coming to Delft Service](#). This service provides information for new international employees to help you prepare the relocation and to settle in the Netherlands. The Coming to Delft Service offers a [Dual Career Programme](#) for partners and they organise events to expand your (social) network.

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 as one of our core [values](#) and we actively [engage](#) to be a university where you feel at home and can flourish. We value different perspectives and qualities. We believe this makes our work more innovative, the TU Delft community more vibrant and the world more just. Together, we imagine, invent and create solutions

using technology to have a positive impact on a global scale. That is why we invite you to apply. Your application will receive fair consideration.

Challenge. Change. Impact!

Faculty Mechanical, Maritime and Materials Engineering

From chip to ship. From machine to human being. From idea to solution. Driven by a deep-rooted desire to understand our environment and discover its underlying mechanisms, research and education at the 3mE faculty focusses on fundamental understanding, design, production including application and product improvement, materials, processes and (mechanical) systems.

3mE is a dynamic and innovative faculty with high-tech lab facilities and international reach. It's a large faculty but also versatile, so we can often make unique connections by combining different disciplines. This is reflected in 3mE's outstanding, state-of-the-art education, which trains students to become responsible and socially engaged engineers and scientists. We translate our knowledge and insights into solutions to societal issues, contributing to a sustainable society and to the development of prosperity and well-being. That is what unites us in pioneering research, inspiring education and (inter)national cooperation.

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? These [videos](#) will introduce you to some of our researchers and their work.

Additional information

For more information about this vacancy, please contact dr. Luca Laurenti, Assistant Professor, l.laurenti@tudelft.nl.

Application procedure

Are you interested in this vacancy? Please apply via the application button before 8 July 2023 and upload:

- 1-page motivation letter
- your CV
- (a part of) your M.Sc. thesis or a paper that you have written, in which you demonstrate your writing skills
- academic transcripts of both your BSc and MSc degrees.

Please highlight in your motivation letter and/or CV examples of projects and achievements that demonstrate your relevant competences.

For information about the application procedure, please contact Ms. Linda Verhaar, HR Advisor, recruitment-3me@tudelft.nl.

A pre-employment screening can be part of the selection procedure.
You can apply online. We will not process applications sent by email and/or post.
Please do not contact us for unsolicited services.

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