Delft Center for Systems and Control

TU Delft
Delft University of Technology

Assistant Professor - AI for Systems and Control

Challenge: *High complexity of systems and control problems requires radically new AI approaches.*
Change: *Develop safe and efficient AI methods to address this complexity.*
Impact: *New fundamental methods.*

Job description

Delft Center for Systems and Control (DCSC) coordinates the education and research activities in systems and control at the Delft University of Technology, in the Faculty Mechanical, Maritime and Materials Engineering (3mE).

In this position your research area will be oriented towards fundamental methods and methodologies in one or more of the following fields (non-exhaustive list):

- scalable and distributed machine learning approaches for control of large-scale systems
- system-oriented AI approaches for forecasting and control in uncertain environments
- secure, privacy-aware, reliable, fair, and/or ethical AI methods for decision making in dynamic environments
- AI methods for condition monitoring and resilient control of complex networks
- physics-informed or bio-inspired AI for systems and control
- data mining and model mining approaches to construct interpretable models
- efficient mixed human-machine decision making
  or any other similar or related topic along these lines that falls into the field of AI methods for systems and control. Your prospective research activities will involve the development of systematic and computationally efficient modeling, analysis, control, and/or verification methods within the topics listed above.

In addition, within this position applications of the developed fundamental methods should be targeted towards application fields that could either connect to current application fields at DCSC, such as: road and freeway networks, transportation systems, smart power grids, smart energy systems, water distribution networks, robotics, renewable energy, smart buildings, sensor fusion, social and biological networks; or that could focus on a completely new field within DCSC that is related to the current research fields of the Faculty of Mechanical, Maritime and Materials Engineering (see https://www.tudelft.nl/en/3me/research/check-out-our-science/).

Artificial intelligence, data and digitalisation are becoming increasingly important when looking for answers to major scientific and societal challenges. TU Delft is recruiting 16 talented researchers, who will have the opportunity to push the boundaries of science by using AI. Your drive is to solve research questions which arise from scientific and societal challenges and contribute to the development and execution of domain specific education. You will be a member of the thriving Artificial Intelligence community within TU Delft that fosters cross-fertilization between talents with different expertise and disciplines. The TU Delft AI Labs (DAI-Labs) are a perfect example how different disciplines work together in the field of AI.

The Faculty of Mechanical, Maritime and Materials Engineering has the ambition to strengthen its position in AI education as well, as an understanding of the principles and applications of modern data science and AI is essential for new generations of systems and control, mechanical, maritime, and

materials engineers. It is anticipated that all bachelor and master programs will incorporate an AI component in the near future. The relevant programs here are the MSc program in Systems and Control and the BSc programme in Mechanical Engineering. You will take the lead in developing the AI components of these educational programs. This requires setting up courses that add synergistically to the existing learning lines, as well as coordinating a coherent vision on AI education in systems and control, taking also into account embedding in the broader scope of AI in the engineering sciences. It is expected of the candidate to propose a vision on education in AI as well, considering the context described above. You are expected to actively pursue collaboration within TU Delft to establish a DAI-lab with a clear focus on research, education, and societal value. You are expected to propose a clear and appealing vision on a cooperation that would fit with your profile.

The 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

- PhD degree in systems and control, artificial intelligence, computer science, applied mathematics, mechanical engineering, electrical engineering, or a related field, and with an extensive expertise in the broad fields of AI and systems and control.
- At least 1 year of post-doctoral experience.
- An international reputation in your field of research and a proven track record in conducting innovative fundamental research, demonstrated by the ability to publish in leading international journals.
- An ambitious vision on the development of your own research program using AI and to establish cooperation with other groups at the university, national, and international level.
- Experience with teaching and mentoring is considered an advantage.
- The ability to work in a team and inspire others, to take initiative, to be results-oriented.
- Good communication skills in verbal and written English are essential requirements.

Conditions of employment

At the start of the tenure-track, you will be appointed as Assistant Professor for the duration of six years. Section leader, department leaders and you will agree upon expected performance and (soft) skills. You will receive formal feedback on performance and skills during annual assessment meetings and the mid-term evaluation. If the performance and skills are evaluated positively at the end of the tenure track, you will be appointed in a permanent Assistant Professor position.

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. The TU Delft sets specific standards for the English competency of the teaching staff. The TU Delft offers training to improve English competency. Inspiring, excellent education is our central aim. If you have less than five years of experience and do not yet have your teaching certificate, we allow you up to three years to obtain this.

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.

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 prof. Bart De Schutter,
email: b.deschutter@tudelft.nl tel: +31 (0)15-2785113.

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

Application procedure

To apply, please e-mail:

- a detailed CV with a short letter of motivation,
- a personal research and teaching statement (max 3 pages),
- contact information of three referees,
- a publication list,
- an abstract of your PhD thesis,
- links to two selected publications,
  compiled into a single pdf file named ‘TUD00364_YourLastName.pdf’ by August 30, 2020
  to application-3mE@tudelft.nl.

When applying for this position, please refer to vacancy number TUD00364.

Please note: Applications will not be processed if all documents required are not compiled into a single pdf document. The application deadline for the position is August 30, 2020. However, the position will stay open until a suitable candidate has been found.

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