Delft Center for Systems and Control

TU Delft
Delft University of Technology

Assistant Professor on Data Driven Control of Multi-dimensional Systems

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Job description

Data Driven control aims to construct a controller or condition monitoring filter of unknown dynamical systems directly from measurements. A challenging class of systems are systems where the dynamics are multi-dimensional in both space and time and where the actuators and sensors measure/control different aspects in terms of spatial and temporal dynamics/resolution. The position is to develop new data-driven algorithms for control and monitoring of such systems. This development is both based on theoretical rigor to analyze and demonstrate their performances (statistically, numerically, etc.) as well as validating their use in lab set ups as well as real-life demos. The topic is multi-disciplinary, including mathematical statistics, numerical analysis and systems and control theory, while high-end applications may include for example thermal control of wafer deformation, wafer inspection in lithographic applications, etc. or fault tolerant control for Industry 4.0. Other target application areas belonging to the expertise of the candidate may be considered as well.

The candidate is expected to complement the state of the art of ongoing research at DCSC and is able to strengthen the strong position the DCSC control lab has in that area. In the validation of the new algorithms, the candidate should be able to build their own laboratory environment.

Requirements

Applicants should possess the following qualification and attributes:

- A Ph.D. degree in Systems and Control, Electrical Engineering, Physics, Applied Mathematics, Computer Science or another relevant engineering discipline, with an outstanding scholar record and a strong commitment to excellence in research and teaching.
- Experience in a broad range of signal processing applications such as fiber optics and adaptive optics.

With a strong background in the broad area of Data Driven Control for linear, nonlinear and multidimensional systems with expertise and/or interest in one or more of the following (but not limited to):

1. Advanced and emerging areas of systems and control, e.g., adaptive control of large-scale systems or reinforcement learning control, scenario based methods for distributed optimization.
2. Machine learning and artificial intelligence, e.g., deep learning techniques and theory, Bayesian learning, active learning.
3. Distributed optimization of a combination of smooth and non-smooth convex functions.
4. Applications in high-tech manufacturing, security, safety systems, automotive, aerospace, or biomedical systems.

Conditions of employment

This position is offered as an Academic Career Track position (0.8 – 1.0 FTE). During the Academic Career Track, we expect you to grow towards an Associate Professor position within a maximum of eight years, for which a position will be available. With other Academic Career Track colleagues, you will participate in the Academic Career Track Development programme, where you are offered ample opportunities to develop yourself in the areas of Education, Research, Societal Impact & Innovation, and Leadership & Organisation. You will regularly discuss your development and results with senior staff based on a personalized development and performance criteria agreed upon at the start of your Academic Career Track. You will start with a temporary contract that will be converted to a permanent contract no later than 12 -18 months after a positive evaluation, based on continuous confidence in your development potential and fit in the organisation.

Inspiring, excellent education is our central aim. We expect you to obtain a University Teaching Qualification (UTQ) within three years if you have less than five years of teaching experience. This is provided by the TU Delft UTQ programme as part of the Academic Career Track Development programme.

TU Delft sets high standards for the English competency of the teaching staff. The TU Delft offers training to improve English competency. If you do not speak Dutch, we offer courses to learn the Dutch language within three years.

Salary and benefits are in accordance with the Collective Labour Agreement for Dutch Universities (€ 3.974,00 - € 5.439,00). The TU Delft offers a customisable compensation package, a discount on health insurance and sport memberships, and a monthly work costs contribution. Flexible work schedules can be arranged and you can work partly from home.

For international applicants, TU Delft has the Coming to Delft Service. This service addresses the needs of new international employees and those of their partners and families. The Coming to Delft Service offers personalised assistance during the preparation of the relocation, finding housing and schools for children (if applicable). In addition, a Dual Career Programme for partners is offered. The Coming to Delft Service will do their best to help you settle in the Netherlands.

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 Prof.Dr. Michel Verhaegen, m.verhaegen@tudelft.nl.

Application procedure

Are you interested in this vacancy? Please apply by June 15, 2023 via the application button and add the following documents to your application:

1. Motivation letter.
2. Detailed CV.
3. Recent teaching evaluations (if available).
4. Teaching statement.
5. Research statement.
6. Two research papers (published or unpublished).
7. Names and contact information of at least three relevant references.

We will not process applications sent by email and/or post.

Evaluation of candidates will start immediately until the position is filled, with a closing date of June 15, 2023.

After the first selection, the process foresees (video) interviews and site visits for the successful candidates.

For information about the application procedure, please contact Ms Linda Ruijters, 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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