



# Assistant Professor Human-in-the-loop Control and Learning

Apply Now

**Challenge:** The presence of humans as actors, sensors, or actuating agents in complex systems creates challenges in terms of unpredictability and uncertainty that cannot yet be handled adequately by current control and learning approaches.

**Change:** Develop mathematical frameworks and efficient control and learning approaches to analyze and optimize the performance of complex dynamical systems with human actors.

**Impact:** New fundamental control and learning methodologies for human-in-the-loop systems.

## Job description

This position targets the development of monitoring, control, and/or learning approaches for integrated human-in-the-loop systems (also called cyber-human-physical systems: CHPS) or more in general for complex systems with humans as active components. In such systems, humans could act as a sensor (providing e.g., qualitative assessment of water levels or soil condition for water management/irrigation systems) and/or as controllers (e.g. human operators adjusting gates in water management/irrigation systems) cooperating and complementing automated control systems. The information provided by the humans needs to be merged with automated sensor readings, and control commands should be determined considering the actions that human operators may take. Automated systems may also restrict or suggest actions that operators can apply. As such this position involves the development of novel monitoring, control, and learning approaches that take these aspects into account. In a broader context the position targets human-system interaction in a systems and control setting.

The research area of the position will be oriented towards fundamental methodologies and engineering tools in one or more of the following fields (non exhaustive list):

- human-in-the-loop monitoring and control
- human-in-the-loop learning
- learning and control for complex large-scale systems with humans as actors, sensors, or actuating agents
- modeling of human behavior, human interaction, and human-system interaction
- data-driven analysis and control of human-in-the-loop systems
- real-time implementation aspects of customizable human-assisted control systems.

Within this position, applications of the developed fundamental methods should be targeted towards sustainable management of canal or surface water systems, agriculture, socio-technical systems, intelligent transportation systems, and/or application fields that relate to current application fields at DCSC; or towards 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/](https://www.tudelft.nl/en/3me/research/check_out_our_science/)).

## Requirements

We are looking for a candidate with a PhD degree in systems and control, computer science, applied mathematics, mechanical engineering, electrical engineering, or a related field, and with expertise in one or more of the following fields: (hybrid) dynamical systems, machine learning for control, modeling of human behavior, distributed control, formal verification of control systems, data-driven analysis and synthesis of control systems, stochastic control, reliable AI, real-time control, and optimization for control.

You should preferably have at least 1 year of post-doctoral experience. You should already have gained an international reputation in your field of research and also have a proven track record in conducting innovative fundamental research, demonstrated by the ability to publish in leading international journals. You are expected to have an ambitious vision on the development of your own research program and to establish cooperation with other groups at the university, national, and international level.

You should also have the didactic abilities for teaching systems and control courses at the BSc, MSc, and postgraduate level, and for supervising MSc projects. 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, as well as good communication skills in verbal and written English are essential requirements.

In accordance with the equal opportunity policy of Delft University of Technology female candidates in particular are encouraged to apply.

## 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. 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. Bart De Schutter, [b.deschutter@tudelft.nl](mailto:b.deschutter@tudelft.nl).

## Application procedure

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

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.

Evaluation of candidates will start immediately until the position is filled, with a closing date of August 1, 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](mailto:recruitment-3me@tudelft.nl)

Please note:

- 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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