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## FACULTY POSITION in OPTIMAL CONTROL OF THERMOFLUIDS NETWORKS

### Delft Center of Systems and Control, Delft University of Technology, The Netherlands

The Delft Center for Systems and Control (DCSC) is aiming to strengthen, expand, and renew its international competences through new strategic recruitments sponsored by the Dutch Ministry of Education, Culture, and Science. We are looking for excellent candidates with a proven track record of ground breaking scientific research, a challenging and innovative research program, and a commitment to higher education. As part of this initiative, we are offering either a tenure-track assistant professor position for a period of 6 years, leading to a permanent position assuming excellent performance, or – depending on the current position, background, and expertise of the candidate – a tenured associate professor position. During the tenure track, the candidate will have the opportunity to develop into an internationally acknowledged and recognized academic. To this aim, we offer a structured career and personal development program.

#### Focus areas

This new position is intended to bridge the fields of control systems and thermofluids fundamentals by complementing existing research efforts at the department, and serving as a research liaison with the Process and Energy Department of the Faculty of Mechanical, Maritime and Materials Engineering. Potential application areas include (but are not limited to) district heating/cooling networks. The matching between (intermittent) heat sources with different temperature levels and consumers will play an important role in the energy transition. System integration poses a fundamental challenge, where thermal storage is envisioned to balance heat and electricity grids. This is a complex optimization problem that requires novel control approaches incorporating the underlying turbulent fluid flow and related nonlinear heat transfer processes.

Preferred expertise includes (but is not limited to) the following topics:

- Model reduction, optimization, control, and monitoring of nonlinear distributed parameter systems
- Stabilization, delay compensation, and control of infinite-dimensional systems modelled by coupled/networked PDEs
- Real-time optimization by extremum seeking control
- Fluid/thermal flow dynamics, instabilities, fluid networks, magneto-hydrodynamics
- Applications of novel approaches in control/modeling of turbulent fluid flow and heat transfer, topology design and optimal control of heat networks, multiscale process systems.

The successful candidate will be part of the Networked Cyber-Physical Systems section at DCSC, whose research efforts are aimed at improving our understanding and control of cyber-physical systems composed of a large number of interconnected and embedded components. Such networks of systems contain a huge number of sensors and actuators that generate a tremendous amount of data to be processed in real-time in order to increase the autonomy of the participating entities, or accomplish a high level of automation.

#### Profile of the candidate

We are looking for candidates with a research profile that complements and/or expands our current activities. In particular, we are looking for candidates with a PhD degree in systems and control, computer science, applied mathematics, mechanical engineering, electrical engineering, or informatics, and with an extensive expertise in the

topics defined above as well as the broad field of systems and control. The candidate should already have gained an international reputation in her/his field of research and also has a proven track record in conducting innovative fundamental research, demonstrated by the ability to publish in leading international journals.

The candidate should also have the didactic abilities for teaching systems and control courses at the BSc, MSc, and postgraduate level, and for supervising MSc projects. A good command of English is an essential requirement.

### **Conditions of employment**

The tenure-track position is offered for six years. The section leader, department leaders and the successful candidate will agree upon expected performance and (soft) skills. Formal feedback on performance and skills will be provided during annual assessment meetings and the mid-term evaluation. Based on the performance indicators agreed upon at the start of the appointment, a decision will be made by the fifth year whether to offer a permanent faculty position. If the performance and skills are evaluated positively at the end of the tenure track, a permanent Assistant Professor position will be offered.

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.

TU Delft sets specific standards for the English competency of the teaching staff. TU Delft offers training to improve English competency. Inspiring, excellent education is one of our central aims. 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.

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

Faculty:	Mechanical, Maritime and Materials Engineering (3mE)
Department:	Delft Center for Systems and Control (DCSC)
Level:	PhD degree
Working hours:	32-38 hours per week
Contract:	Tenured
Salary:	€3637—€6738 per month gross

### **Application**

For more information about this position, please contact Dr.ir. Tamás Keviczky ([t.keviczky@tudelft.nl](mailto:t.keviczky@tudelft.nl)).

To apply, please submit the following items by email to Ms Irina Bruckner ([application-3mE@tudelft.nl](mailto:application-3mE@tudelft.nl)) and refer to vacancy number 3mE19-43:

- 1) a detailed curriculum vitae that explicitly states your educational record, recent major achievements, list of publications,
- 2) a separate motivation letter stating why the proposed research topic interests you,
- 3) a vision on research and education, and
- 4) the names of three persons who could be contacted for a reference and any other information that might be relevant to your application.

The application deadline is January 1, 2020. However, the position will stay open until a suitable candidate has been found.