# 4 PhDs in Control Engineering & Smart Optics

**Engels -- Faculty/department** Mechanical, Maritime and Materials Engineering
**Level** Master degree
**Maximum employment** Maximum of 38 hours per week (1 FTE)
**Duration of contract** 4 years
**Salary scale** €2083 to €2664 per month gross

## Mechanical, Maritime and Materials Engineering

The 3mE Faculty trains committed engineering students, PhD candidates and post-doctoral researchers in groundbreaking scientific research in the fields of mechanical, maritime and materials engineering. 3mE is the epitome of a dynamic, innovative faculty, with a European scope that contributes demonstrable economic and social benefits.

The Delft Centre for Systems and Control (DCSC) is currently composed of 15 academic staff members who supervise around 50 PhD students and 120 MSc students. The teaching and research field encompasses the wide area of modelling, estimation and identification, robust control and optimisation of continuous and hybrid dynamical systems. Applications include, but are not limited to, mechatronics and microsystems, robotics, sustainable industrial processes, transportation and traffic control, and physical imaging systems.

The ERC research challenge
Within the scope of Prof. Michel Vergaegen's ERC Advanced grant entitled "Integrated Real-time Feedback Control and Post-processing for Image Restoration" (iCON), a new methodology will be developed for designing the high-resolution imaging equipment of the future in application fields like microscopy, astronomy, optical coherence tomography and nanoscopy. The design methodology integrates and expands novel, model-based control methodologies with smart optical components, starting from the outset of the design of the high-resolution imaging system. The new researchers will have the opportunity to work in a multidisciplinary team of international experts. This will allow both the realisation of new, innovative, fundamental systems and control contributions as well as the opportunity to demonstrate their practical relevance via state-of-the-art demonstrators in astronomy and microscopy.

## Job description

The positions are defined within the framework of the ERC project to realise four objectives. A brief outline with the starting dates is as follows:
Objective 1 (PhD - Feb. 2014): System identification of spatial-temporally varying dynamical systems
Objective 2 (PhD - Feb. 2014): Wavefront reconstruction and experiment design with active optics
Objective 3 (PhD and Post-doc - Jan. 2015): Distributed robust feedback control and

updating for adaptive, real-time image resolution enhancement
Objective 4 (PhD and Post-doc - Jan. 2015): Integration of real-time feedback control and post-processing.

## Requirements

The researchers should have a strong background and interest in the development of novel systems and control algorithms. Researchers should have expertise and interest in one or more of the following areas: identification and robust control, spatial-temporal distributed systems, large-scale optimisation, adaptive optics, wavefront reconstruction, image processing, optics. Candidates should have an MSc degree in one of the following areas: Mathematics, Applied Physics, Electrical Engineering, Cybernetics, Mechanical or Aerospace Engineering. The candidates should have demonstrated ability to conduct high quality research according to international standards, as demonstrated by publications in international, high quality journals in the field of systems and control. Additional experience in setting up an optics lab for validation of new system theoretic developments is an asset.

## Conditions of employment

TU Delft offers an attractive benefits package, including a flexible work week, free high-speed Internet access from home (with contracts of two years or longer), and the option of assembling a customised compensation and benefits package (the 'IKA'). Salary and benefits are in accordance with the Collective Labour Agreement for Dutch Universities.
As a PhD candidate you will be enrolled in the TU Delft Graduate School. TU Delft Graduate School provides an inspiring research environment; an excellent team of supervisors, academic staff and a mentor; and a Doctoral Education Programme aimed at developing your transferable, discipline-related and research skills. Please visit www.phd.tudelft.nl for more information.

## Information and application

For more information about this position, please contact Prof. Michel Verhaegen, phone: +31 (0)15-2785204, e-mail: m.verhaegen@tudelft.nl. To apply, please e-mail a detailed CV , including a list of publications (if available), the names of three professional references, a summary of your MSc thesis and a letter of application to A.M.D. Gerretsen, application-3mE@tudelft.nl. These positions will remain posted until filled.
In your application for one of the PhD positions, please refer to vacancy number 3ME13-34.