

The Delft Center for Systems and Control of the Delft University of Technology, The Netherlands, announces a

Ph.D. position

## **Integrated Smart Microscopy**

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### [Delft Centre for Systems and Control](#)

The Delft Centre for Systems and Control (DCSC) coordinates the education and research activities in systems and control at Delft University of Technology. The Centre's research mission is to conduct fundamental research in systems dynamics and control, involving dynamic modelling, advanced control theory, optimization and signal analysis. The research is motivated by advanced technology development in mechatronics and microsystems, sustainable industrial processes, transportation and automotive systems, and physical imaging systems. The group actively participates in the Dutch Institute of Systems and Control (DISC).

### [Job description](#)

The aim of this project is, in a team of experts from Micro-electronics, Image Processing and Biomedical imaging, to develop an integrated smart confocal microscope for live cell imaging, which combines adaptive optics (AO) in the imaging path with adaptive postprocessing of the resulting 3D image data. As a proof of concept, several challenging biomedical research questions will be addressed using the new microscope system.

This PhD-project is focused on control systems research, in order to develop real-time control strategies and hardware components for improved scanning, active compensation, and adaptive optics that allow acquisition of real-time sharp images over a wide field of view. The key research objective is to integrate prediction and control design methodologies in optimizing the overall performance of the new microscope system, in terms of resolution as well as product complexity (and costs). In addition to investigating the instrument design (e.g. optimal location of sensors and actuators), we aim to achieve higher overall imaging performance by optimizing the tradeoff between feedback and postprocessing (as a function of sensor noise, process noise, et cetera).

### [Requirements](#)

We are looking for a candidate with a MSc degree in Electrical or Mechanical Engineering, Physics, Mathematics, Aerospace Engineering or equivalent, with a strong background in either systems and control and/or optical systems. The candidate is expected to develop integrated control algorithms, to validate these in laboratory demonstrators, and to publish his/her research in scientific journals and conferences.

### [Conditions of employment](#)

TU Delft offers an attractive benefits package, including a flexible work week, free high-speed Internet access from home, and the option of assembling a customized compensation and benefits package (the 'IKA'). Salary and benefits are in accordance with the Collective Labour

Agreement for Dutch Universities.

### Information and application

If you are interested in this position, you may send:

i) your Curriculum Vitae, ii) a cover letter stating your motivation, iii) your grades, iv) a summary of your MSc thesis and list of publications (if any), and v) the names and contact data of two professional reference persons electronically or as hard-copy, written in the English language and mentioning the vacancy number **AT3mE-09.04** to: [Application-3mE@tudelft.nl](mailto:Application-3mE@tudelft.nl) .

The position will remain open until filled. However, interviewing of candidates will start in early April 2009. Additional Information about this position can be obtained from Dr.ir. Georg Schitter, [g.schitter@tudelft.nl](mailto:g.schitter@tudelft.nl).