Delft Center for Systems and Control

TU Delft
Delft University of Technology

PhD Position Robust Stochastic Decision-Making, Optimal Control, and Planning (for Autonomous Greenhouse Solutions)

Do you want to be part of the multidisciplinary SYNERGIA team of researchers from 5 Dutch universities working towards next-generation agricultural production systems that are sustainable, circular and regenerative?

Job description

The SYNERGIA research project, funded by the Netherlands Organisation for Scientific Research (NWO), contributes to the UN Sustainability Development Goals for the environment (depletion of scarce resources, global warming, acidification, eutrophication, nutrient losses, and biodiversity loss), labour (availability of skilled workers), and society (consumer/societal acceptance of novel technology and production methods). SYNERGIA goes beyond current precision agriculture and is developing the new concept of "Technology-4-Ecology-based farming" (T4E) where biological/ecological principles in farming lead the development of new farming systems, and of the required technological knowledge, principles and tools. Our multi-disciplinary team with biology, ecology, agronomy, technology and social science backgrounds will devise farming technologies to enable and support truly ecology-based farming systems. Click here for the Technology for Ecology website.

We are looking for a talented, motivated and outstanding Ph.D. candidate with enthusiasm for interdisciplinary research challenges at the interface of Systems and Control Theory, Optimisation, and Horticultural Applications.

The successful candidate will be supervised by Tamas Keviczky (TU Delft), and will conduct both theoretical and algorithmic/applied research on the design of robust model-based and data-driven stochastic economic predictive control algorithms for the aerial and root zone environments in autonomous greenhouses, within the research project SYNERGIA: SYstem change for New Ecology-based and Resource efficient Growth with high tech In Agriculture.

We offer the opportunity to perform scientifically challenging research in a multi-disciplinary research group in collaboration with several key academic and industrial partners in next-generation agricultural production systems. The PhD student will also be able to participate in the research school DISC.

Department
The department Delft Center for Systems and Control (DCSC) of the faculty Mechanical, Maritime and Materials Engineering, coordinates the education and research activities in systems and control at Delft University of Technology. The Centers' research mission is to conduct fundamental research in systems dynamics and control, involving dynamic modelling, advanced control theory, optimisation and signal analysis. The research is motivated by advanced technology development in physical imaging systems, renewable energy, robotics and transportation systems.

Requirements

Candidates for this challenging project should have an MSc degree and background in e.g., systems and control, applied mathematics, electrical/mechanical engineering, or related field. The candidate should demonstrate a strong theoretical background in terms of mathematical and systems-and-control knowledge, and expertise in robust and model predictive control, and stochastic systems. A successful candidate should have good programming skills, an ability and interest to conduct interdisciplinary research, and act as a team player who is willing to actively participate in project meetings and discussions across diverse scientific fields. In addition, excellent written and oral communication skills in English are important for this position (Dutch not required).

Conditions of employment

TU Delft offers PhD-candidates a 4-year contract, with an official go/no go progress assessment after one year. Salary and benefits are in accordance with the Collective Labour Agreement for Dutch Universities, increasing from € 2395 per month in the first year to € 3061 in the fourth year. As a PhD candidate you will be enrolled in the TU Delft Graduate School. The TU Delft Graduate School provides an inspiring research environment with an excellent team of supervisors, academic staff and a mentor. The Doctoral Education Programme is aimed at developing your transferable, discipline-related and research skills.

The TU Delft offers a customisable compensation package, discounts on health insurance and sport memberships, and a monthly work costs contribution. Flexible work schedules can be arranged. For international applicants we offer the Coming to Delft Service and Partner Career Advice to assist you with your relocation.

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 and aim to be as inclusive as possible (see our Code of

Conduct). Together, we imagine, invent and create solutions using technology to have a positive impact on a global scale.

Challenge. Change. Impact!

Faculty Mechanical, Maritime and Materials Engineering

The Faculty of 3mE carries out pioneering research, leading to new fundamental insights and challenging applications in the field of mechanical engineering. From large-scale energy storage, medical instruments, control technology and robotics to smart materials, nanoscale structures and autonomous ships. The foundations and results of this research are reflected in outstanding, contemporary education, inspiring students and PhD candidates to become socially engaged and responsible engineers and scientists. The faculty of 3mE is a dynamic and innovative faculty with an international scope and high-tech lab facilities. Research and education focus on the design, manufacture, application and modification of products, materials, processes and mechanical devices, contributing to the development and growth of a sustainable society, as well as prosperity and welfare.

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? This video will introduce you to some of our researchers and their work.

Additional information

For information about this vacancy, you can contact Prof. Tamás Keviczky, email: t.keviczky@tudelft.nl, tel: +31 (0)15 2782928.

For information about the selection procedure, please contact Irina Bruckner, HR Advisor, email: application-3mE@tudelft.nl.

Application procedure

Interested applicants should send their detailed curriculum vitae, the names of up to three professional referees, a list of courses taken with grades obtained in their BSc and MSc program (in English), a list of publications (if any), a summary of their MSc thesis, and a cover letter stating their motivation to application-3mE@tudelft.nl with reference to vacancy number TUD00578.

Applications should be submitted by email by 1 December 2020 to application-3mE@tudelft.nl.

The review of applications will start on 15 December 2020.

General information is also available from the DCSC website.

A pre-employment screening can be part of the application procedure.