Delft Center for Systems and Control

TU Delft
Delft University of Technology

PhD position Signal Processing for Nonlinear Waves

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Job description

Nonlinear waves are of broad interest in engineering, the natural sciences and mathematics. They occur in diverse application areas such as optics, ocean science, traffic flow or materials science. In recent years, signal processing methods for nonlinear waves that used to be mainly of theoretical interest have started to get attention in several application fields. This PhD project aims to further this process.

We are looking for a PhD student with a background in an engineering discipline, physics or mathematics to work in the area of signal processing for data governed by nonlinear wave equations. The position can be focused either on the development of novel methods, or on the exploration of new applications. The candidate should have a relevant background such as, for example, numerical methods, signal processing, machine learning, or an application field related to nonlinear waves.

The current methodological focus in our group is on a) spectral data analysis approaches for nonlinear systems such as nonlinear Fourier analysis and Koopman operator methods, and b) machine learning approaches. We are interested both in the development of new methods and in the exploration of new applications, currently in the areas of optical communications and coastal and ocean engineering.

The precise topic of the project will be developed together with the candidate, where the background of the candidate will be taken into account. Alternative methods or application areas can be considered.

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

- Master degree in a relevant engineering discipline, natural science or mathematics. Candidates that are close to obtaining their degree can be considered as well.

- Good command of the English language.
- Experience related to the topic, for example, in numerical methods, signal processing, machine learning, or an application field related to nonlinear waves.
- Good programming skills (for example in Python, Julia, Matlab or C) are a plus.

Doing a PhD at TU Delft requires English proficiency at a certain level to ensure that the candidate is able to communicate and interact well, participate in English-taught Doctoral Education courses, and write scientific articles and a final thesis. For more details please check the Graduate Schools Admission Requirements.

Conditions of employment

Doctoral candidates will be offered a 4-year period of employment in principle, but in the form of 2 employment contracts. An initial 1,5 year contract with an official go/no go progress assessment within 15 months. Followed by an additional contract for the remaining 2,5 years assuming everything goes well and performance requirements are met.

Salary and benefits are in accordance with the Collective Labour Agreement for Dutch Universities, increasing from € 2443 per month in the first year to € 3122 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 more information about this vacancy, please contact Sander Wahls,
email: s.wahls@tudelft.nl.

For information about the application procedure, please contact Hilma Bleeker,
email: application-3me@tudelft.nl.

Application procedure

Are you intersted in this vacancy? Please apply via the application button before 15 August 2022 and upload:

- Motivational letter that highlights your skills relevant for the position
- Curriculum Vitae
- Samples of academic writing (preferably the Master thesis, additional documents are encouraged if available)
- Course transcripts for Bachelor and Master with grades (in English)
- English test scores (if available)
- Contact information for two academic references.

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.
Acquisition in response to this vacancy is not appreciated.

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