

2 PhD Positions on Secure and Optimal Control of Renewable Energy Systems

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Challenge: Accelerate the Transition to Renewable Energy Generation

Change: Develop secure and optimal control algorithms for wind farms

Impact: Prove they work by organizing a hackathon!

Job description

Renewable energy sources, such as wind farms, are crucial for realizing climate neutrality, energy independence, and energy security.

With their increased penetration in the electricity grid, there is a strong need for distributed control algorithms that can optimally determine the amount of energy to produce, and its destination (e.g., grid, storage, hydrogen). Still, the issues of scalability (think about wind farms comprising hundreds to thousands of turbines), resiliency to failures, uncertainty in the environment and the market, and security against malicious actors are far from being solved.

As part of two Horizon-funded projects involving several partners in the EU we will develop open-source technology for optimal, resilient, and secure wind farm control. To address this challenge we are currently looking for two (2) PhD's that would work on one or more of the following research topics:

- optimal and resilient distributed control algorithms for wind farm control;
- security of distributed control algorithms against cyber-attacks
- laboratory demonstration of optimal and secure distributed control algorithms on actual industrial control hardware and software.

You will have the chance to organise a hackathon in order to involve the community at large, or develop a serious game to let them explore the effect of anomalies, uncertainties and cyber-attacks on the resiliency of your control algorithms.

Requirements

- You have obtained a MSc. degree in a field related to the project, such as Electrical or Electronics engineering, Systems & Control, Applied Mathematics, Mechanical engineering or Aerospace engineering.
- Or are going to obtain it before the starting date of the position.
- You have a good command of the English language.
- You have strong coding skills.
- Do you also have a background in Distributed Control and/or Industrial Control Systems security? Then you are especially encouraged to apply.

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 € 2770 per month in the first year to € 3539 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, TU Delft has the [Coming to Delft Service](#). This service provides information for new international employees to help you prepare the relocation and to settle in the Netherlands. The Coming to Delft Service offers a [Dual Career Programme](#) for partners and they organise events to expand your (social) network.

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 as one of our core [values](#) and we actively [engage](#) to be a university where you feel at home and can flourish. We value different perspectives and qualities. We believe this makes our work more innovative, the TU Delft community more vibrant and the world more just. Together, we imagine, invent and create solutions using technology to have a positive impact on a global scale. That is why we invite you to apply. Your application will receive fair consideration.

Challenge. Change. Impact!

Faculty Mechanical, Maritime and Materials Engineering

From chip to ship. From machine to human being. From idea to solution. Driven by a deep-rooted desire to understand our environment and discover its underlying mechanisms, research and education at the 3mE faculty focusses on fundamental understanding, design, production including application and product improvement, materials, processes and (mechanical) systems.

3mE is a dynamic and innovative faculty with high-tech lab facilities and international reach. It's a large faculty but also versatile, so we can often make unique connections by combining different disciplines. This is reflected in 3mE's outstanding, state-of-the-art education, which trains students to become responsible and socially engaged engineers and scientists. We translate our knowledge and insights into solutions to societal issues, contributing to a sustainable society and to the development of prosperity and well-being. That is what unites us in pioneering research, inspiring education and (inter)national cooperation.

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? These [videos](#) will introduce you to some of our researchers and their work.

Additional information

For more information about this vacancy, please contact Dr. Riccardo Ferrari [<http://www.dcsc.tudelft.nl/~riccardoferrari>], r.ferrari@tudelft.nl.

Application procedure

Are you interested in this vacancy? Please apply by 6 October 2023 via the application button and upload: a motivation letter, a curriculum vitae, a list of publications, transcripts of courses with grades and obtained degrees, contact information for two academic references and up to 3 research-oriented documents (e.g. thesis, conference/journal publication).

For information about the application procedure, please contact Ms. Irina Bruckner, HR Advisor, recruitment-3me@tudelft.nl.

Please note:

- 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.
- Please do not contact us for unsolicited services.

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