

## PhD

Ecole/Institution/Société:

**University of Stavanger, Norway / Stavanger**

Discipline:

**Computer and Society**

Type d'emploi::

**Full-time**

Date de publication:

**2022-04-25**

Personne à contacter:

**If you wish to apply for this position, please specify that you saw it on AKATECH.tech**

### **PhD Fellowship in Methods for Linearising Switched and Quantised Systems**

#### **Job description**

The University of Stavanger invites applications for a 3-year PhD Fellowship in Methods for Linearising Switched and Quantised Systems at the Faculty of Science and Technology, Department of Energy and Petroleum Engineering. The appointment is for three years with research duties exclusively.

This is a trainee position that will give promising researchers an opportunity for academic development through a PhD education leading to a doctoral degree.

The hired candidate will be admitted to the PhD program in Science and technology. The education includes relevant courses to about six months of study, a dissertation based on independent research, participation in national and international research environments, relevant academic communication, a trial lecture and public defence. Read more about the PhD education at UiS on our website.

#### **Information about the project**

The PhD Fellow will be affiliated with the following project "Ultra-linear Digital-to-analogue Conversion".

The project aims to develop methods for linearising switched and quantised systems. Existing methods include pulse-width modulation, delta-sigma modulation, noise-shaping, dithering and model-predictive control. The project will aim at developing methods suitable for high bandwidth and low computational complexity.

The ability to use control signals to smooth non-linearities has been known in control engineering since the 1940's, and was successfully applied to reduce friction (mechanical lubrication) in cannon turrets and quench limit cycles due to non-linear valves in hydroelectric power plants. In more recent years such methods have been extensively used in power electronics to improve power quality and reliability, to achieve "super-resolution" in digital signal processing: [e.g.](#) for image processing (most notable the Hubble space telescope), distortion-free re-quantisation between data types, or high-fidelity audio recording.

All participants in the project bring unique and important qualities with them into the doctoral programme. The PhD candidate will have the opportunity to collaborate with researchers in the partner institutions and benefit from these collaborative research and education activities. The group you will be joining has used dithering techniques to build the highest resolution digital-to-analogue converter known in the literature and will serve as the starting point of the current project. The project is a collaboration between the University of Stavanger, Norwegian University of Science and Technology, Aalborg University, Justervesenet (Norwegian Metrology Service) and Eindhoven University of Technology, as well as The University of Newcastle, Australia. An extended research stay at one or more of these institutions is encouraged.

The main objective for this position is to develop linearising methods applicable to switched and quantised systems, specifically

- developing new methods and comparing to existing methods,
- determining properties when introducing feedback (closed-loop applications),
- and investigating applications such as power electronics and drives

The work can focus on experimental results in the lab or be more oriented towards theory, depending on the candidate's background and interests.

As part of the project team, you will work alongside other highly motivated and talented PhD candidates and researchers. You will also have access to the knowledge base, state-of-the-art research infrastructure, and impact orientation of the partners in the team.

### **Qualification requirements**

We are looking for applicants with a strong academic background who have completed, or is about to

complete, a Master's degree or possess corresponding qualifications equal to 300 ECTS.

### **Relevant fields are:**

- control engineering,
- applied mathematics and
- signal processing,
- but related fields can be considered.

To be eligible for admission to the doctoral programmes at the University of Stavanger both the grade for your master's thesis and the weighted average grade of your master's degree must individually be equivalent to or better than a B grade. If you finish your education (masters degree) in the spring of 2022 you are also welcome to apply.

The grade requirement is 'B' or higher (based on the ECTS scale). Applicants with a certificate from an institution with a different grading scale than the Norwegian scale (the ECTS grading scale) should attach a confirmed conversion scale, comparing it to the ECTS grading scale and a Diploma Supplement or similar that explains the scope of the subjects that are included in the education.

### **In the assessment the following criteria will be emphasised:**

- experience with systems and control
- experience with optimisation and estimation ([i.e.](#) model-predictive control)
- experience with microcontrollers and FPGAs
- the quality and relevance of your publications and capacity for work
- motivation and potential for research within the field

- professional and personal skills for completing the doctoral degree within the timeframe
- ability to work independently and in a team, be innovative and creative
- experience and enthusiasm for experimental work
- having a good command of both oral and written English

## **Requirements for competence in English**

A good proficiency in English is required for anyone attending the PhD program. International applicants must document this by taking one of the following tests with the following results:

- TOEFL – Test of English as a Foreign Language, Internet-Based Test (IBT). Minimum result: 90
- IELTS – International English Language Testing Service. Minimum result: 6.5
- Certificate in Advanced English (CAE) og Certificate of Proficiency in English (CPE) from the University of Cambridge
- PTE Academic – Pearson Test of English Academic. Minimum result: 62

## **The following applicants are exempt from the above requirements:**

- Applicants with one year of completed university studies in Australia, Canada, Ireland, New Zealand, United Kingdom, USA
- Applicants with an International Baccalaureate (IB) diploma
- Applicants with a completed bachelor's and / or master's degrees taught in English in a EU/EEA country

## **We offer**

- a PhD education in a large, exciting and socially important organisation
- an ambitious work community which is developing rapidly. We strive to include employees at all levels in strategic decisions and promote an informal atmosphere with a flat organisational structure.
- salary in accordance with the State Salary Scale, [L.pj](#) 17.515, code 1017, NOK 491 200 gross per year with salary development according to seniority in the position. A higher salary may be considered in special cases. From the salary, 2% is deducted as a contribution to the Norwegian Public Service Pension Fund.
- automatic membership in the Norwegian Public Service Pension Fund, which provides favourable insurance- and retirement benefits
- favourable membership terms at a gym and at the SIS sports club at campus
- employment with an Inclusive Workplace organisation which is committed to reducing sick leave, increasing the proportion of employees with reduced working capacity, and increasing the number of professionally active seniors
- "Hjem-jobb-hjem" discounted public transport to and from work
- as an employee in Norway, you will have access to an optimal health service, as well as good pensions, generous maternity/paternity leave, and a competitive salary. Nursery places are guaranteed and reasonably priced
- relocation programme
- language courses: On this page you can see which language courses you may be entitled to (look up "language courses" under employment conditions)

## **Diversity**

University of Stavanger values independence, involvement and innovation. Diversity is respected and considered a resource in our work and learning environment. Universal design characterises physical and digital learning environments, and we strive to provide reasonable adjustments for employees with disabilities.

You are encouraged to apply regardless of gender, disability or cultural background.

The university aims to recruit more women within the subject area. If several applicants are considered to have equal qualifications, female applicants will be given priority.

## **Contact information**

More information on the position can be obtained from Associate Professor Arnfinn A. Eielsen, **e-mail:** [arnfinn.a.eielsen@uis.no](mailto:arnfinn.a.eielsen@uis.no)

Information about the appointment procedure can be obtained from HR advisor Margot [A.Treen](#), tel: +4751831419, **e-mail:** [rekruttering@uis.no](mailto:rekruttering@uis.no).

## **Application**

To apply for this position please follow the link "Apply for this job". Your application letter, relevant education and work experience as well as language skills must be registered here. In your application letter, you must state your research interests and motivation for the position.

## **The following documents must be uploaded as attachments to your application:**

- a cover letter addressing the selection criteria, and how participation in the project may advance
- your competences and qualifications
- your CV detailing relevant education and work experience
- certificates and diplomas
- transcripts and diplomas for Bachelor's and Master's degrees; if you have not completed the Master's degree, you must submit a confirmation that the Master's thesis has been submitted
- a copy of the Master's thesis; if you recently have submitted your master's thesis, you can attach a
- a draft of the thesis; documentation of a completed master's degree must be presented before taking up the position
- a list of 3 nominated referees and contact information
- if you have publications or other relevant research work
- other documentation that you consider relevant

Applications are evaluated based on the information available in Jobbnorge at the application deadline. You should ensure that your application shows clearly how your skills and experience meet the criteria which are set out above and that you have attached the necessary documentation.

The documentation must be available in either a Scandinavian language or in English. If the total size of the attachments exceeds 30 MB, they must be compressed before upload.

Please note that information on applicants may be published even if the applicant has requested not to be included in the official list of applicants - see Section 25 of the Freedom of Information Act. If your request is not granted, you will be notified.

UiS only considers applications and attachments registered in Jobbnorge.

## **General information**

The engagement is to be made in accordance with the regulations in force concerning State Employees and Civil Servants, and the acts relating to Control of the Export of Strategic Goods, Services and Technology. If your application is considered to be in conflict with the criteria in the latter legislation, it will be rejected without further assessment.

Employment as PhD Fellow is regulated in "Regulations concerning terms and conditions of employment for the posts of post-doctoral research fellow and research fellow, research assistant and resident".

Your qualifications for the position, based on documentation registered in Jobbnorge, will be assessed by an internal expert committee. Based on the committee's statement, relevant applicants will be invited to an interview before any recommendations are made. References will also be obtained for relevant candidates. More about the hiring process on our website.

The appointee will be based at the University of Stavanger, with the exception of a stay abroad at a relevant centre of research.

It is a prerequisite that you have a residence which enables you to be present at/available to the academic community during ordinary working hours.

The position has been announced in both Norwegian and English. In the case of differences of meaning between the t

UiS - challenge the well-known and explore the unknown

The University of Stavanger (UiS) has about 12,000 students and 2,200 employees. The university has high ambitions. We strive to have an innovative and international profile, and be a driving force in knowledge development and in the process of societal change. Our common direction is driven by consideration for green and sustainable change and equitable social development, through new ways of managing natural resources and facilitating better cities and local communities. Energy, health and welfare, learning for life are our focus areas.

In constant collaboration and dialogue with our surroundings, regionally, nationally and internationally, we enjoy an open and creative climate for education, research, innovation, dissemination and museum activities. Academic life at the University of Stavanger is organised into six faculties comprising various departments/schools and National Research Centres, as well as the Museum of Archaeology. We are a member of the European Consortium of Innovative Universities. The university is located in the most attractive region in the country with more than 300,000 inhabitants. The Stavanger region has a dynamic labour market and exciting cultural and leisure activities.

Together with our staff and students we will challenge the well-known and explore the unknown.

The Faculty of Science and Technology offers study programs at bachelor, master and doctoral level. The faculty has established close cooperation on research with NORCE (Norwegian Research Centre AS) and the regional industry. A number of master's and doctoral theses are made in collaboration with the industry. The faculty has established research collaborations with universities in the US and Europe, and has developed several academic environments that are at the forefront internationally. The faculty has about 2,800 students and approximately 500 employees at the Department of Electrical Engineering and Computer Science, Department of Structural Engineering and Materials Science, Department of Mathematics and Physics, Department of Energy and Petroleum Engineering, Department of Energy Resources and the Department of Safety, Economics and Planning.

Department of Energy and Petroleum Engineering carries out research and offers study programs at all levels in Drilling Technology, Natural Gas Technology, Petroleum Engineering and Energy Technology. The department has established close research collaboration with relevant industry - especially in the petroleum and battery sector. The department focuses on internationalization, with the development of English study programs and high mobility among academic staff and students. There are currently 60 employees including research fellows and postdocs.

## **Job details**

**Title:** PhD Fellowship in Methods for Linearising Switched and Quantised Systems

**Employer:** University of Stavanger

**Location:** Kjell Arholmsgt. 41 Stavanger, Norway

**Job type:** PhD

**Field:** Applied Mathematics, Control Systems Engineering, Signal Processing

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