UNIVERSITETET I OSLO

**Jobbnorge ID:** 258552
**Deadline:** 3/10/2024
**Website:** http://www.uio.no/
**Scope:** Fulltime
**Duration:** Engagement

# PhD Research Fellow in Space Sensors and Systems

## About the position

Position as PhD Research Fellow is available at the Centre for Space Sensors and Systems (CENSSS) / Department of Technology Systems (ITS).

No one can be appointed for more than one PhD Research Fellowship period at the University of Oslo.

Starting date is as soon as possible.

The appointment is a fulltime position for a period of three years.

A fourth year may be considered with a workload of 25 % that may consist of teaching, supervision duties, and/or research assistance. This is dependent upon the qualification of the applicant and the current needs of the department.

CENSSS is a Centre for Research-based Innovation (SFI), funded by the Research Council of Norway (RCN) and UiO for up to eight years, starting in November 2020. CENSSS has three research partners and nine user partners. CENSSS is located at Kjeller, Norway, where there is a long history of space science and technology dating back to the 1960s.

CENSSS addresses challenges and opportunities in science, technology and business related to “New-Space” satellites and systems for Earth Observation, as well as Space Exploration, by focusing on novel sensors, systems and services. CENSSS is operating the RIMFAX ground penetrating radar on the NASA Perseverance Mars rover.

CENSSS aims to strengthen competence and capabilities of all its participants in development of space systems.  CENSSS plans to develop and launch a research satellite.

## Knowledge development in a changing world - Science and technology towards 2030.

The Faculty of Mathematics and Natural Sciences

Video: https://www.youtube.com/watch?v=t4wvWQEhDEs

## Job description

The person hired in the position will work on a real-time optimization for Guidance, Navigation, and Control of CENSSS-Sat 1, with the intent of flight experiments in 2027.

Standard spacecraft guidance, navigation, and control (GNC) techniques for reorienting the satellite are rooted in classical frequency-domain approaches which, while offering explicit robustness guarantees, do not take fuel or energy considerations into account.

Real-time optimization techniques, combined with performance improvements in radiation-hardened CPUs, have made the prospect of real-time optimal control in spacecraft systems possible.

The PhD Research Fellow will develop real-time optimal control tools for spacecraft GNC, derive relevant stability and robustness margins, and implement the method on a flat sat with a HIL simulator before implementing it on CENSSS-Sat 1.

The core activity of the Centre shall support Researchers, PhD candidates and Postdocs. They work in close contact with the research and user partners of CENSSS.

In 2023, the department started a Master’s degree program in Space systems, in collaboration with other departments at UiO and other organizations.

## Qualification requirements

The Faculty of Mathematics and Natural Sciences has a strategic ambition to be among Europe’s leading communities for research, education and innovation. Candidates for these fellowships will be selected in accordance with this, and expected to be in the upper segment of their class with respect to academic credentials.

- Master’s degree or equivalent in cybernetics, computer engineering, automation, or related fields
- Foreign completed degree (M.Sc.-level) corresponding to a minimum of four years in the Norwegian educational system

- The topic of the Masters degree must be of relevance to the position
- Preference will be given to candidates with 1 year or more of industrial experience in spacecraft GNC
- Applicants must have experience in one or more of the topics:
    - Model-predictive control in spacecraft GNC applications
    - Robust control analysis & spacecraft mission safety
    - Development & testing of various control methods for GNC applications
    - High-fidelity simulation and modeling of spacecraft GNC
    - Robustness margins of neural-network based controllers
    - Experience in Python, C/C++, Matlab/Simulink, Assembly, Optimization languages such as YALMIP/CVX/Gurobi
- Fluent oral and written communication skills in English
- **The research area for the position can include technologies or information referred to in the Ministry's export control regulations or the Norwegian National Security Act (Lov om Nasjonal Sikkerhet, a.k.a. "Sikkerhetsloven"), and the candidate must be eligible to obtain a security clearance**

**Grade requirements:**
The norm is as follows:

- The average grade point for courses included in the Bachelor's degree must be C or better in the Norwegian educational system
- The average grade point for courses included in the Master's degree must be B or better in the Norwegian educational system
- The Master's thesis must have the grade B or better in the Norwegian educational system
- English requirements for applicants from outside of EU/ EEA countries and exemptions from the requirements:

https://www.mn.uio.no/english/research/phd/regulations/regulations.html#toc8

The purpose of the fellowship is research training leading to the successful completion of a PhD degree.

The fellowship requires admission to the PhD programme at the Faculty of Mathematics and Natural Sciences. The application to the PhD programme must be submitted to the department no later than two months after taking up the position.

For more information see:

http://www.uio.no/english/research/phd/

http://www.mn.uio.no/english/research/phd/

## Personal skills

- Ability to take initiative and come up with new ideas to solve theoretical and practical problems
- Ability to work independently as well as in a team
- Good personal communication skills

## We offer

- Salary NOK 532 200 - 575 400 per annum depending on qualifications and seniority as PhD Research Fellow (position code 1017)
- Attractive welfare benefits and a generous pension agreement
- Vibrant international academic environment
- Career development programmes
- Oslo's family-friendly surroundings with their rich opportunities for culture and outdoor activities

## How to apply

The application must include:

- Cover letter - statement of motivation and research interests
- CV (summarizing education, positions and academic work - scientific publications)
- Copies of the original Bachelor and Master's degree diploma and transcripts of records
- Documentation of English proficiency
- List of publications and academic work that the applicant wishes to be considered by the evaluation committee
- Names and contact details of 2-3 references (name, relation to candidate, e-mail and telephone number)

The application with attachments must be delivered in our electronic recruiting system (please follow the link "Apply for this job"). Foreign applicants are advised to attach an explanation of their University's grading system. Please note that **all** documents should be in English or a Scandinavian language.

Interviews with the best qualified candidates will be arranged.

## Formal regulations

Please see the guidelines and regulations for appointments to Research Fellowships at the University of Oslo.

According to the Norwegian Freedom and Information Act (Offentleglova) information about the applicant may be included in the public applicant list, also in cases where the applicant has requested non-disclosure.

UiO has an agreement for all employees, aiming to secure rights to research results a.o.

Inclusion and diversity are a strength. The University of Oslo has a personnel policy objective of achieving a balanced gender composition. Furthermore, we want employees with diverse professional expertise, life experience and perspectives.

If there are qualified applicants with disabilities, employment gaps or immigrant background, we will invite at least one applicant from each of these categories to an interview.

### Contact information

For further information about the position, please contact:

Associate professor Mathias Hudoba de Badyn, e-mail: mathias.hudoba@its.uio.no

For technical questions regarding Jobbnorge, please contact:

HR Adviser Olga Holmlund, e-mail: olga.holmlund@mn.uio.no

## About the University of Oslo

**The University of Oslo** is Norway's oldest and highest rated institution of research and education with 28 000 students and 7000 employees. Its broad range of academic disciplines and internationally esteemed research communities make UiO an important contributor to society.

The University of Oslo (UiO) is expanding the activity at Campus Kjeller to strengthen our education, research, and innovation in technology for a sustainable future. UiO is a well-ranked research university where the Department of Technology Systems at Kjeller (ITS) is focused on applied research in sustainable energy, autonomous systems, space, and security.

At Kjeller, ITS is co-located with the Norwegian Defense Research Establishment (FFI) and the Institute for Energy Technology (IFE), which both offer rich opportunities for collaboration. ITS also has a range of interdisciplinary research collaborations that include the UiO Blindern Campus and Oslo Science City, as well as many other national and international institutions and industries.

ITS offers several master level programmes, alone and jointly with other departments: Renewable energy systems, Cybernetics and autonomous systems, Robotics and intelligent systems, and Information security.

ITS also hosts the Centre for Space Sensors and Systems (CENSSS), which incorporates operation of an instrument on the NASA Perseverance rover on Mars.

A new master program in Space systems is in the planning stage. The department currently has 9 permanent scientific staff, approximately 35 adjunct staff from the research institutes at Kjeller and from industry, as well as about 20 PhD candidates.

This position is part of an ongoing expansion of the UiO activity at Campus Kjeller. Campus Kjeller is located 20 km northeast of Oslo, between the city center and Oslo Airport. It is a 20 minutes commute with public transportation from Oslo city center to the campus.

### Additional information

#### Place of service:

Gunnar Randers vei 19 2007 Kjeller (Lillestrøm Municipality)