Jobbnorge ID: 257631
Deadline: 3/1/2024
Website: http://www.ntnu.no
Scope: Fulltime
Duration: Temporary

The Department of Marine Technology has a vacancy for a

PhD Candidate in marine robotics for autonomous environmental characterization

This is NTNU

NTNU is a broad-based university with a technical-scientific profile and a focus in professional education. The university is located in three cities with headquarters in Trondheim.

At NTNU, 9,000 employees and 43,000 students work to create knowledge for a better world.

You will find more information about working at NTNU and the application process here.

Video: https://youtu.be/Xt-yHCN5QS0

About the job

The Department of Marine Technology at NTNU is seeking a PhD Candidate in “marine robotics for autonomous environmental characterization”. For a position as a PhD Candidate, the goal is a completed doctoral education up to an obtained doctoral degree.

This PhD position will focus on research enabling robotic systems that can, mostly in an unsupervised manner, characterize and monitor marine environments. Autonomous systems enable cost-effective extensive data collection, surveillance and inspection in the ocean and offer the possibility for performing continuous operations with less dependence on human operators. These attributes make autonomous systems desirable for robotic organizations performing operations to explore, map and monitor challenging marine environments. Successful missions in the unstructured and harsh ocean, however, requires improved safety, intelligence, and operational capabilities through optimized observation platform systems and supervisory risk control, which is addressed in the SAFEGUARD project (“Intelligent autonomous systems for safeguarding operations and infrastructure at sea”). This position complements research in ongoing projects SAFEGUARD and CAROS (“Centre for Autonomous Robotics Operations Subsea”) which are developing similar capabilities with a focus on subsea infrastructure. Specifically, this position will address one or more of these areas:

- 1) Multimodal perception and situational awareness: Exploring and navigating in complex natural terrain using in-situ (or relatively short range) underwater sensing modalities (such as RGB cameras, hyperspectral imagers and high frequency sonars) together with prior remote sensing information (e.g., acoustic or lidar bathymetry, acoustic backscatter, sidescan imagery, etc).
- 2) Model-driven goals: Generating spatially explicit models that represent the environmental state (e.g., benthic cover) and do so while generating meaningful uncertainty estimates that can guide additional sampling efforts.
- 3) Risk-aware adaptive planning: generating and updating survey plans given relevant factors such as prior maps, their evolving predictive quality, terrain complexity, prevailing environmental forcing, navigation quality, and energy and time budgets.

There are opportunities for multi-modal, multi-scale perception and representation learning, as well as simultaneous localization and mapping, automated classification, detection and segmentation using AI and deep learning that relies on all available information across different underwater remote sensing modalities. One high-impact research direction is in coupling these perceptual/scene understanding aspects with large-extent predictive models and uncertainty estimates that enable cost-effective adaptive, risk-aware survey planning. Collaboration with researchers in project SAFEGUARD and CAROS will enable more ambitious and far-reaching development and demonstrations.

Your research is expected to cover theoretical work, extensive simulation and field experiments and demonstrations in diverse environments. Your role will provide ample opportunities to interact and collaborative with fellow marine technologists and marine scientists.

At the Applied Underwater Robotics Laboratory (AUR-Lab) we work to deliver outstanding results in both marine research and industrial projects. Our lab has a stimulating and productive research environment, where we continuously develop cutting-edge expertise in technology in an innovative environment. AUR-Lab is equipped with modern facilities and infrastructure that support your projects providing a unique opportunity.

Your immediate leader is your supervisor. For administration purposes, this position reports to the Head of Department.

Duties of the position

- Perform research leading to a PhD within the topics of:

    - adaptive underwater environmental exploration, navigation, characterization and monitoring applicable to single or multiple robotic platforms.
    - multi-modal and multi-scale perception and representation learning.
- Design and carry out field experiments and demonstrations.

Required selection criteria

- Professionally relevant background in robotics, engineering cybernetics, mechatronics, controls, computer science, or related fields.
- Education must correspond to a five-year Norwegian degree program, where 120 credits are obtained at master's level.
- Strong academic background from your previous studies and an average grade from the master's degree program, or equivalent education, which is equal to B or better compared with NTNU's grading scale. If you do not have letter grades from previous studies, you must have an equally good academic basis. If you have a weaker grade background, you may be assessed if you can document that you are particularly suitable for a PhD education.
- Master's students can apply.
- You must meet the requirements for admission to the faculty's doctoral program.
- Excellent written and oral English language skills.

Our research has civilian objectives. However, equipment restricted by export licenses and ITAR (International Traffic in Arms Regulations) is being used in the research project. Access to high- resolution seafloor observations and maps is also restricted in Norway. Applicants that are citizens of Norway, Australia, Japan, New Zealand, Switzerland, EU or NATO countries are eligible. Other applicants are required to provide evidence of eligibility to use such equipment for their application to be considered/in their application.

The appointment is to be made in accordance with Regulations on terms of employment for positions such as postdoctoral fellow, Phd candidate, research assistant and specialist candidate and Regulations concerning the degrees of Philosophiae Doctor (PhD) and Philosophiae Doctor (PhD) in artistic research at the Norwegian University of Science and Technology (NTNU)

Preferred selection criteria

- Extensive hands-on experience with underwater robots and marine systems.
- Strong software development skills.
- Relevance of MSc topic
- Other relevant experience with machine learning for perception, SLAM and path planning.
- Good written and oral Norwegian language skills.

Personal characteristics

- Fast learner with strong analytical skills.
- Flexible and dependable.
- Collaborative and open-minded.
- Innovative with a practical mindset.

Emphasis will be placed on personal and interpersonal qualities.

We offer

- exciting and stimulating tasks in a strong international academic environment
- an open and inclusive work environment with dedicated colleagues
- favourable terms in the Norwegian Public Service Pension Fund
- employee benefits

Salary and conditions

As a PhD candidate (code 1017) you are normally paid from gross NOK 532 200 per annum before tax, depending on qualifications and seniority. From the salary, 2% is deducted as a contribution to the Norwegian Public Service Pension Fund.

The period of employment is 3 years.

Appointment to a PhD position requires that you are admitted to the PhD programme in Engineering within three months of employment, and that you participate in an organized PhD programme during the employment period.

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. Candidates who by assessment of the application and attachment are seen to conflict with the criteria in the latter law will be prohibited from recruitment to NTNU.

After the appointment you must assume that there may be changes in the area of work.

It is a prerequisite you can be present at and accessible to the institution daily.

About the application

The application and supporting documentation to be used as the basis for the assessment must be in English.

Publications and other scientific work must be attached to the application. Please note that your application will be considered based solely on information submitted by the application deadline. You must therefore ensure that your application clearly demonstrates how your skills and experience fulfil the criteria specified above.

The application must include:

- CV and certificates.
- 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 draft of the thesis. Documentation of a completed master's degree must be presented before taking up the position.
- Project proposal.
- Name and contact information of three referees.
- If you have publications or other relevant research work.

If all, or parts, of your education has been taken abroad, we also ask you to attach documentation of the scope and quality of your entire education, both bachelor's and master's education, in addition to other higher education. Description of the documentation required can be found here. If you already have a statement from NOKUT, please attach this as well.

We will take joint work into account. If it is difficult to identify your efforts in the joint work, you must enclose a short description of your participation.

In the evaluation of which candidate is best qualified, emphasis will be placed on education, experience and personal and interpersonal qualities. Motivation, ambitions, and potential will also count in the assessment of the candidates.

NTNU is committed to following evaluation criteria for research quality according to The San Francisco Declaration on Research Assessment - DORA.

General information

Working at NTNU

NTNU believes that inclusion and diversity is our strength. We want to recruit people with different competencies, educational backgrounds, life experiences and perspectives to contribute to solving our social responsibilities within education and research. We will facilitate for our employees' needs.

NTNU is working actively to increase the number of women employed in scientific positions and has a number of resources to promote equality.

The city of Trondheim is a modern European city with a rich cultural scene. Trondheim is the innovation capital of Norway with a population of 200,000. The Norwegian welfare state, including healthcare, schools, kindergartens and overall equality, is probably the best of its kind in the world. Professional subsidized day-care for children is easily available. Furthermore, Trondheim offers great opportunities for education (including international schools) and possibilities to enjoy nature, culture and family life and has low crime rates and clean air quality.

As an employee at NTNU, you must at all times adhere to the changes that the development in the subject entails and the organizational changes that are adopted.

A public list of applicants with name, age, job title and municipality of residence is prepared after the application deadline. If you want to reserve yourself from entry on the public applicant list, this must be justified. Assessment will be made in accordance with current legislation. You will be notified if the reservation is not accepted.

If you have any questions about the position, please contact Oscar Pizarro, e-mail: oscar.pizarro@ntnu.no or Professor Asgeir J. Sørensen, telephone +47 91897457, email asgeir.sorensen@ntnu.no. If you have any questions about the recruitment process, please contact Marit Gjersvold, e-mail: marit.gjersvold@ntnu.no.

If you think this looks interesting and in line with your qualifications, please submit your application electronically via jobbnorge.no with your CV, diplomas and certificates attached. Applications submitted elsewhere will not be considered. Upon request, you must be able to obtain certified copies of your documentation.

Application deadline: 01.03.2024

NTNU - knowledge for a better world

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The Norwegian University of Science and Technology (NTNU) creates knowledge for a better world and solutions that can change everyday life.

Department of Marine Technology

We develop methods and technology related to the blue economy: oil and gas extraction at sea, ship technology and the equipment industry, fisheries and aquaculture. We also have a strong commitment to the development of sustainable solutions for offshore renewable energy, coastal infrastructure, and marine robotics. Marine technology helps to solve major global challenges related to the environment, climate, energy, food and efficient transport. The Department of Marine Technology is one of eight departments in the Faculty of Engineering.

Additional information

Place of service: