

Jobbnorge ID: 179667
Deadline: 1/15/2020
Website: <http://www.ntnu.no>
Scope: Fulltime
Duration: Project

The Department of Engineering Cybernetics has a PhD candidate vacancy on multi-sensor integrity for autonomous vehicle navigation.

PhD candidate

This is NTNU

At NTNU, creating knowledge for a better world is the vision that unites our 7 000 employees and 40 000 students.

We are looking for dedicated employees to join us.

Video: <https://www.youtube.com/watch?v=clgKd1SwGLI>

About the position

We have a vacancy for a PhD candidate at Department of Engineering Cybernetics, on the topic of autonomous vehicle navigation safety using multi-sensor fusion, within the research project Navigation System Integrity Assurance for Safety-Critical Autonomous Operations, that is led by Sintef Digital and funded by the Research Council of Norway.

The research and education at the Department of Engineering Cybernetics cover a wide range of relevant topics including sensors, embedded systems, robotics, autonomous systems, unmanned vehicles, navigation, and automatic control. The research activity is associated with the Center of Excellence on Autonomous Marine Operations and Systems (AMOS) at NTNU (<https://www.ntnu.edu/amos>). The Center for Autonomous Marine Operations and Systems (NTNU-AMOS) contributes with fundamental and interdisciplinary knowledge on autonomous systems in marine applications.

The PhD candidate is supervised by Professor Tor Arne Johansen, and co-supervised by Adjunct Associate Professors Nadia Sokolova and Torleiv Bryne.

Main duties and responsibilities

Global satellite navigation such as GPS cannot be expected to provide sufficient levels of safety in autonomous systems, when used stand-alone. It is considered necessary to combine satellite navigation with data from independent sources and sensors such as ground-based augmentation systems, inertial measurement units and imaging sensors. This requires the use of advanced sensor fusion methods such as SLAM (simultaneous localization and mapping), INS (inertial navigation) and algorithms to monitor the different sensors. The main challenge to be addressed by the PhD project is development of methods for evaluating uncertainty and monitoring integrity in sensor fusion systems in an effective and safe way.

Qualification requirements

The PhD-position's main objective is to qualify for work in research positions. The qualification requirement is completion of a master's degree or second degree (equivalent to 120 credits) with a strong academic background in control engineering, cybernetics, robotics, applied/industrial mathematics or equivalent education with a grade of B or better in terms of [NTNU's grading scale](#). Applicants with no letter grades from previous studies must have an equally good academic foundation. Applicants who are unable to meet these criteria may be considered only if they can document that they are particularly suitable candidates for education leading to a PhD degree. Competence on autonomous vehicles, sensor fusion, robotic vision, navigation and embedded systems is an advantage. Applicants that expect to complete their MSc studies by summer 2020 can apply. Candidates that expect to complete their master thesis at NTNU in the cybernetic and robotics program, or the industrial cybernetics program, by summer 2021 can also apply for an integrated PhD which means that the final year of the 5-year master program is integrated with the PhD degree.

Excellent English skills, written and spoken, are required. Applicants from non-European countries where English is not the official language must present an official language test report. The following tests can be used as such documentation: TOEFL, IELTS or Cambridge Certificate in Advanced English (CAE) or Cambridge Certificate of Proficiency in English (CPE). Minimum scores are:

TOEFL: 600 (paper-based test), 92 (Internet-based test)

IELTS: 6.5, with no section lower than 5.5 (only Academic IELTS test accepted)

CAE/CPE: grade B or A.

The research of this project has civilian objectives. However, equipment restricted by export licenses and ITAR (International Traffic in Arms Regulations) is being used in this research area. Applicants that are citizens of Norway, NATO countries, Australia, Japan, New Zealand, or Sweden are eligible. Other applicants must provide evidence of eligibility to use such equipment for their application to be considered.

The appointment is to be made in accordance with the regulations in force concerning State Employees and Civil Servants and national guidelines for appointment as PhD, post doctor and research assistant.

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

Personal characteristics

Applicants are required to justify their candidateship by explicitly explaining their personal motivation and academic aptitude for pursuing a doctoral degree within this research field.

In the evaluation of which candidate is best qualified, emphasis will be placed on education, experience and personal suitability, in terms of the qualification requirements specified in the advertisement.

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

PhD candidates are remunerated in code 1017, and are normally remunerated at gross from NOK 479 600 per annum before tax. From the salary, 2% is deducted as a contribution to the Norwegian Public Service Pension Fund.

The period of employment is nominally 3 years, but can be 4 years if teaching duties or integrated PhD is agreed. Appointment to a PhD position requires admission to the PhD programme in Engineering Cybernetics. As a PhD candidate, you undertake to participate in an organized PhD programme during the employment period. A condition of appointment is that you are in fact qualified for admission to the PhD programme within three months.

Appointment takes place on the terms that apply to State employees at any time, and after the appointment you must assume that there may be changes in the area of work.

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 criterias in the latter law will be prohibited from recruitment to NTNU.

General information

A good work environment is characterized by diversity. We encourage qualified candidates to apply, regardless of their gender, functional capacity or cultural background. Under the Freedom of Information Act (Offentleglova), information about the applicant may be made public even if the applicant has requested not to have their name entered on the list of applicants.

The national labour force must reflect the composition of the population to the greatest possible extent, NTNU wants to increase the proportion of women in its scientific posts. Women are encouraged to apply. Furthermore, Trondheim offers great opportunities for education (including international schools) and possibilities to enjoy nature, culture and family life (<http://trondheim.com/>). Having a population of 200 000, Trondheim is a small city by international standards with low crime rates and little pollution. It also has easy access to a beautiful countryside with mountains and a dramatic coastline.

Questions about the position can be directed to Professor Tor Arne Johansen, e-mail: tor.arne.johansen@ntnu.no.

About the application:

Publications and other academic works that the applicant would like to be considered in the evaluation must accompany the application. Joint works will be considered. If it is difficult to identify the individual applicant's contribution to joint works, the applicant must include a brief description of his or her contribution.

Please submit your application electronically via jobbno.no with your CV, diplomas and certificates. Applications submitted elsewhere will not be considered. Diploma Supplement is required to attach for European Master Diplomas outside Norway. Chinese applicants are required to provide confirmation of Master Diploma from China Credentials Verification (CHSI): <http://www.chsi.com.cn/en/>.

Applicants invited for interview must include certified copies of transcripts and reference letters. Please refer to the application number 2019/40500 when applying.

Application deadline: January 15th, 2020.

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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 Engineering Cybernetics (ITK)

Engineering cybernetics is the study of automatic control and monitoring of dynamic systems. We develop the technologies of tomorrow through close cooperation with industry and academia, both in Norway and internationally. The Department contributes to the digitalization, automation and robotization of society. The [Department of Engineering Cybernetics](#) is one of seven departments in the [Faculty of Information Technology and Electrical Engineering](#).

Additional information

Place of service:

Trondheim 7491 Trondheim (Trondheim Municipality)