Jobbnorge ID: 227477
Deadline: 6/20/2022
Website: http://www.ntnu.no
Scope: Fulltime
Duration: Project

We are looking for a postdoctoral researcher at the Department of Engineering Cybernetics

Postdoctoral fellow in AI-based planning and acting for autonomous robot missions

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 42,000 students work to create knowledge for a better world.

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

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

About the position

As part of the IKTPLUSS project “ROBPLAN - AI-based planning and acting for autonomous robot missions”, we are looking for a postdoctoral researcher at the Department of Engineering Cybernetics. The postdoctoral fellowship position is a temporary position where the main goal is to qualify for work in senior academic positions.

In many application domains there is a need for robots with high level of autonomy that can operate safely and efficiently in increasingly complex environments. However, even for simple missions, the planning complexity can quickly explode. In addition, high-level action planning is often performed as an offline process where the environment a robot operates in is assumed to be static, which is not the case in the real world. To deal with these challenges, the ROBPLAN project will develop and demonstrate methods for multi-robot autonomous missions in industrial use cases by combining planning with acting in a way that balances needs for long-term planning with needs to react to immediate events in a robust manner. In order to achieve this, the project will build on techniques from symbolic AI approaches (e.g. existing AI planning methods), which involve structured knowledge about the world, and enhance them with non-symbolic AI (e.g. machine learning), which can be used to learn from new data and adjust to changes in the world.

An example use case that is relevant for the project is a mobile robot and a UAV cooperating on an emergency situation at an oil and gas facility. The high-level planner must generate a sequence of actions for both robots, which, when successfully executed, will resolve the situation. Such an event could include that a system for automated planning and acting first deploys an UAV to get a first look and understanding of the emergency, followed by the mobile robot to carry out an intervention to handle the situation (e.g., close a valve).

ROBPLAN (2021-24) is coordinated by SINTEF Digital, with NTNU, Equinor and Scout Drone Inspection as partners. The postdoctoral researcher will therefore be part of a dynamic environment with highly-skilled participants involving academia and industry. Suitable simulation environments and real robots will be provided by the partners to stimulate the research and help verify the quality of the proposed solution within the project.

You will report to Associate Professor Anastasios Lekkas.

The position’s working place is the Department of Engineering Cybernetics, at NTNU campus in Trondheim.

Duties of the position

- Develop machine learning-based methods for high-level mission planning of robots operating in the real world. Naturally, this also involves connecting the proposed high-level planning systems with a robot’s existing perception and control systems.
- Collaborate closely with a researcher focusing on AI planning (automated planning and acting) - based mission planning in order to create more efficient hybrid solutions.
- Run relevant case studies in simulated environments and the real world to verify your solutions.
- Collaborate with the project partners in order to enhance competence building and upscale the project’s results.
- Supervision of MSc students working on topics directly related to the scope of the project.
- Disseminate scientific findings according to the project’s objectives.

Required selection criteria

- You must have completed a Norwegian doctoral degree, or corresponding foreign doctoral degree recognized as equivalent to a Norwegian PhD, in cybernetics, Artificial Intelligence, robotics, computer science, electrical engineering, mathematics, or other relevant fields, ideally with a focus on combining AI with robotics.
- An excellent research track record.
- Excellent communication skills in English (written and oral).
- Excellent collaboration skills.

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

Preferred selection criteria

- Experience from implementing machine learning algorithms, and especially reinforcement learning, on real-world robots.
- An interest in merging high-level AI with robotics in industrial settings.
- Programming skills (Python, C++, ROS, Linux)
- Field work experience will be highly advantageous for this position, but not a hard constraint.

Personal characteristics

- Self-driven, enthusiastic and creative.
- Ability to work independently.
- Critical thinking.
- Open to discovering new frontiers, such as combining symbolic and non-symbolic AI for robotic applications.

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 Postdoctoral Fellow (code 1352) you are normally paid from gross NOK 553 500 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 2 years.

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.

The position is subject to external funding.

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

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 follow the application. Please note that applications are only evaluated based on the information available on the application deadline. You should ensure that your application shows clearly how your skills and experience meet the criteria which are set out above.

If, for any reason, you have taken a career break or have had an atypical career and wish to disclose this in your application, the selection committee will take this into account, recognizing that the quantity of your research may be reduced as a result.

The application must include:

- CV, transcripts and diplomas for bachelor's-, master's- and PhD degrees.
- Academic works - published or unpublished - that you would like to be considered in the assessment
- Research statement (max. 2 pages) indicating the applicant’s view of the main research challenges in the area of the position, how they suggest to do the research work and how this is relevant to their own background and the above research objectives.
- Name and address of three referees

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. Description of the documentation required can be found here. If you already have a statement from NOKUT, please attach this as well.

Joint works will be considered. If it is difficult to identify your contribution to joint works, you must attach a brief 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

A good work environment is characterized by diversity. We encourage qualified candidates to apply, regardless of their gender, functional capacity or cultural background.

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.

Under the freedom of Information Act (Offentleglova), your name, age, position and municipality may be made public even if you have requested not to have your name entered on the list of applicants.

If you have any questions about the position, please contact Associate Professor Anastasios Lekkas, anastasios.lekkas@ntnu.no.

Please submit your application electronically via jobbnorge.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).

If you are invited for interview you must include certified copies of transcripts and reference letters. Please refer to the application number 2022/18549 when applying.

Application deadline: 20.06.2022.

Starting date: September 2022 (flexible).

NTNU

NTNU - knowledge for a better world

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)