UiT The Arctic University of Norway
Department of Computer Science

Jobbnorge ID: 286639
Deadline: 10/26/2025
Website: https://uit.no/startsida
Scope: Fulltime
Duration: Fixed Term

Faculty of Science and Technology

PhD Fellow in Computer Science - Accurate and Scalable Simulation of Edge Systems

The position

Are you interested in doing Computer Science research and improving yourself in this area? A PhD position is available at the Department of Computer Science at UiT The Arctic University of Norway. The research topic of this PhD is Accurate and Scalable Simulation of Edge Systems.You will be part of the Cyber-Physical Systems group.

General information about the position.

The position is for a period of four years. The nominal length of the PhD programme is three years. The fourth year is distributed as 25 % each year and will consist of teaching and other duties. The objective of the position is that you complete research training to the level of a doctoral degree. Admission to the PhD programme is a prerequisite for employment, and the programme period starts on commencement of the position.

The workplace is at UiT in Tromsø. You must be able to start in the position within a reasonable time after receiving the offer. Preferably Winter/spring 2026.

The project

Edge systems play an important role within the computing continuum. They are at the core of various applications including:

- Environmental (agriculture, climate changes, monitoring)
- Smart Cities (traffic, security and emergencies)
- Industrial (logistics, smart grids)
- Health Care

Edge systems are complex. They comprise numerous heterogeneous distributed nodes. These nodes are computing, storing, monitoring, actuating, etc. To couple with these use-cases, edge nodes are based on various computing hardware such as classical computers, single-board computers or micro-controllers. Edge systems network is also complex and unique. It must permit edge nodes to coordinate and exchange information locally and remotely with other systems (e.g., Cloud). To address use-case specific constraints, a wide range of communication technologies are used (e.g., LoRa, Wi-Fi, Nb-IoT etc). On top of that, edge systems are highly dynamic. Nodes can be mobile and prone to connection drops. In extreme cases, node failures are common.

Because of this complexity, being able to rigorously study edge systems and distributed systems in general is crucial. Multiple approaches are available to study distributed systems (e.g., analytical models, emulation prototyping etc). Simulation is a key approach to study distributed systems. It enables researchers to perform complex studies in an easy and flexible way compared to other approaches. Moreover, simulation can be used as a building block and can be part of Digital Twins, which is commonly associated with edge systems use-cases.

This PhD project focuses on proposing a simulation approach that leverages the distributed memory architecture to perform distributed simulations on heterogeneous clusters. Following this approach requires rigorous parallelization of code and extensive validation experiments. Ultimately, distributed simulation would allow to leverage the computational power of cluster nodes and run simulations at scale. These nodes could be monitored and bench-marked during simulation runs. Combining these measurements to the current model predictions could address the problems raised by state-of-the-art shared memory approaches.

Duties of the position:

- To address these research challenges, you will start your PhD with an in-depth literature study of edge systems, distributed systems and simulation.
- You will perform experimental studies of computer systems with the emphasis on the time and energy consumption predictions. From this background, you will be able to provide the requirements and anticipate the challenges raised by the problem statement.

- You will pursue with the design and the evaluation of a first prototype. You will perform extensive experiments to identify potential weaknesses and strength of your solution.
- You will investigate strategies to overcome these weaknesses and evaluate them through numerous experiments.
- You will compare the predictions of current state of the art simulators with the solution that you propose.
- During your PhD, you will document your research work and publish into Computer Science conferences and journals.
- You will have the opportunity to perform teaching assignments in various Computer Science courses and collaborate with researchers in this area.

Want to know more about the position?

For further information about the position, please contact Associate Professor Loïc Guégan:

- phone: +47 77646341
- email: loic.guegan@uit.no

For administrative questions, contact Martin Fjellvang Osima:

- phone: +47 77 64 62 44
- email: martin.osima@uit.no

Qualifications

This position requires:

- A master's degree or equivalent in Computer Science related fields.
- Strong knowledge and interests in computer systems and research.
- A good understanding of Linux-based operating systems
- Familiarity with low level system programming
- Good communication skills in English are necessary, and applicants must document proficiency in English equivalent to Norwegian Higher Education Entrance Qualification.
- Documented fluency of in English and the ability to work in an international environment. Nordic applicants can document their English capabilities by attaching their high school diploma.

Candidates in the final phase of their Master study may apply, as explained in the Application section below.

It is beneficial if you have:

- A background on distributed systems and simulation
- Working knowledge of Norwegian or a Scandinavian language

In the assessment, the emphasis is on the applicant's potential to complete a research education based on the master's thesis or equivalent, and any other scientific work. In addition, other experience of significance for the completion of the doctoral programme may be given consideration.

We will also emphasize motivation and personal suitability for the position. We are looking for candidates who:

- Have good collaboration skills
- Have good communication and interaction with colleagues and students
- Wants to contribute to a good working environment

As many people as possible should have the opportunity to undertake organized research training. If you already hold a PhD or have equivalent competence, we will not appoint you to this position.

Admission to the PhD programme

For employment in the PhD position, you must be qualified for admission to the PhD programme at the Faculty of Science and Technology and participate in organized doctoral studies within the employment period.

Admission normally requires:

- A bachelor's degree of 180 ECTS and a master's degree of 120 ECTS, or an integrated master's degree of 300 ECTS.

In order to gain admission to the programme, the candidate must document sufficient potential for research. The applicant must have a grade point average of C (strong 3.0) or better for the master’s degree, which must contain an independent work. A more detailed description of admission requirements can be found here.

If you are employed in the position, you will be provisionally admitted to the PhD programme. Application for final admission must be submitted no later than two months after taking up the position.

Applicants with a foreign education will be subjected to an evaluation of whether the educational background is equal to Norwegian higher education, following national guidelines from Norwegian Directorate for Higher Education and Skills. Depending on which country the education is from, one or two additional years of university education may be required to fulfil admission requirements, e.g. a 4-year bachelor's degree and a 2-year master's degree. UiT normally accepts higher education from countries that are part of the Lisbon Recognition Convention.

Inclusion and diversity

UiT The Arctic University of Norway is working actively to promote equality, gender balance and diversity among employees and students, and to create an inclusive and safe working environment. We believe that inclusion and diversity are a strength, and we want employees with

different competencies, professional experience, life experience and perspectives.

If you have a disability, a gap in your CV or immigrant background, we encourage you to tick the box for this in your application. If there are qualified applicants, we invite at least one in each group for an interview. If you get the job, we will adapt the working conditions if you need it. Apart from selecting the right candidates, we will only use the information for anonymous statistics.

We offer

- Involvement in an interesting research project
- Good career opportunities
- A good academic environment with dedicated colleagues
- Flexible working hours and a state collective pay agreement
- Pension scheme through the state pension fund
- PhD Fellows are normally given a salary of 550 800 NOK/year with a 3% yearly increase
- If you have to relocate to Tromsø then the Faculty of Science and Technology may reimburse your moving costs. Further details regarding this matter will be made available if you receive an offer from us.

Norwegian health policy aims to ensure that everyone, irrespective of their personal finances and where they live, has access to good health and care services of equal standard. As an employee you will become member of the National Insurance Scheme which also include health care services.

More practical information about working and living in Norway can be found here: https://uit.no/staffmobility

How to apply

Your application must include:

- Cover letter explaining your motivation and research interests
- CV
- Diploma for bachelor's and master's degree
- Official transcripts of grades/academic record for bachelor's and master's degree
- Explanation of the grading system for foreign education (Diploma Supplement if available)
- Documentation of English proficiency
- References with contact information
- Master’s thesis, and any other academic works

Qualification with a master’s degree is required before commencement in the position. If you are near completion of your master’s degree, you may still apply and submit a draft version of the thesis and a statement from your supervisor or institution indicating when the degree will be obtained. You must still submit your transcript of grades for the master’s degree with your application.

All documentation to be considered **must** be in a Scandinavian language or English. Diplomas and transcripts must also be submitted in the original language, if not in English or Scandinavian. If English proficiency is not documented in the application, it must be documented before starting in the position. We only accept applications and documentation sent via Jobbnorge within the application deadline.

General information

The appointment is made in accordance with State regulations and guidelines at UiT. At our website, you will find more information for applicants.

The engagement is to be made in accordance with 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.

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

Remuneration for the position of PhD Fellow is in accordance with the State salary scale code 1017. A compulsory contribution of 2 % to the Norwegian Public Service Pension Fund will be deducted. You will become a member of the Norwegian Public Service Pension Fund, which gives you many benefits in addition to a lifelong pension: You may be entitled to financial support if you become ill or disabled, your family may be entitled to financial support when you die, you become insured against occupational injury or occupational disease, and you can get good terms on a mortgage. Read more about your employee benefits at: spk.no.

A shorter period of appointment may be decided when the PhD Fellow has already completed parts of their research training programme or when the appointment is based on a previous qualifying position PhD Fellow, research assistant, or the like in such a way that the total time used for research training amounts to three years.

We process personal data given in an application or CV in accordance with the Personal Data Act (Offentleglova). According to the Personal Data Act information about the applicant may be included in the public applicant list, also in cases where the applicant has requested non-disclosure. You will receive advance notification in the event of such publication, if you have requested non-disclosure.

Assessment

The applicants will be assessed by an expert committee. The committee's mandate is to undertake an assessment of the applicants' qualifications based on the written material presented by the applicants, and the detailed description draw up for the position. A copy of the assessment report will be sent to all applicants.

The applicants who are assessed as best qualified will be called to an interview. The interview should among other things, aim to clarify the applicant’s motivation and personal suitability for the position.

Eallju - Developing the High North

UiT The Arctic University of Norway is a multi-campus comprehensive university at the international forefront. Our vision is to be a driving force for developing the High North. The Northern Sami notion eallju, which means eagerness to work, sets the tone for this motive power at UiT. Along with students, staff and the wider community, we aim to utilise our location in Northern Norway and Sápmi, our broad and diverse research and study portfolio and interdisciplinary advantage to shape the future.

Our social mission is to provide research-based education of high quality, perform artistic development and carry out research of the highest international quality standards in the entire range from basic to applied. We will convey knowledge about disciplines and contribute to innovation. Our social mission unites UiT across various studies, research fields and large geographical distances. This demands good cooperation with trade and industry and civil society as well as with international partners. We will strengthen knowledge-based and sustainable development at a regional, national and international level.

Academic freedom and scientific and ethical principles form the basis for all UiT's activities. Participation, co-determination, transparency and good processes will provide the decision-making basis we need to make wise and far-sighted priorities. Our students and staff will have the opportunity to develop their abilities and potential. Founded on academic integrity, we will be courageous, committed and generous in close contact with disciplines, people and contemporary developments.

We will demonstrate adaptability and seek good and purposeful utilisation of resources, so we are ready to meet the expectations and opportunities of the future. We will strengthen the quality and impact of our disciplines and core tasks through the following three strategic priority areas.

Additional information

Place of service:

Hansine Hansens veg18 9019 Tromsø (Tromsø - Romsa Municipality)