![NTNU - Norwegian University of Science and Technology]

Jobbnorge ID: 246480
Deadline: 9/15/2023
Website: http://www.ntnu.no
Scope: Fulltime
Duration: Temporary

The Department of Information Security and Communication Technology (IIK) has a vacancy for a

PhD Candidate in Cryptography Engineering

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 goals for this PhD Candidate position are to obtain a doctoral degree and contribute to ongoing research in cryptography engineering.

The field of cryptography has shown to be the key enabling technology in securing communication systems. Cryptographic functionality realized in microcontrollers and embedded systems has become essential to our daily use of communication networks. The theory and practice of engineering of cryptographic systems include encryption/decryption, authentication, digital signatures, random number generators, and their utilization in practical security protocols. New cryptographic algorithms propounding security against quantum computers are under development and being standardized internationally, denoted quantum-safe algorithms. However, plain implementations turn out to be vulnerable to various physical and electrical signal processing attacks, denoted side-channel attacks.

Relevant research problems for this position are in the context of real-world quantum-safe algorithms:

- Creating tools and methods for analysing hardware/software cryptographic implementations, including machine-learning tools.
- Physical side-channel analysis and testing of embedded devices performing cryptographic functions.
- Techniques for realizing cryptographic hardware concerned with physical side-channels.

Your main supervisor will be Professor Stig Frode Mjølsnes and your co-supervisor will be Associate Professor Tjerand Silde at the Department of Information Security and Communication Technology in Trondheim.

Duties of the position
- Complete the PhD programme of the department
- Conduct collaborative research within the problem area of real-world cryptography as described above
- Contribute to a cryptography engineering laboratory at the department
- Co-supervise master students relevant to this research activity

Required selection criteria
- A completed master's programme degree in either computer engineering, signal processing, micro-electronics, embedded computing, including computer science and mathematical studies.
- Alternatively, you are in the final year of a relevant master's programme that enables you to apply for NTNU's integrated master's & PhD programme.
- Document a strong academic background from your previous studies and an average grade from the master's degree programme, or equivalent education, equal to B or better compared with NTNU's grading scale. If documented skills and experience are particularly suitable for this PhD position, then admission to the PhD programme can be conditioned on a successful completion of extra courses to strengthen your competence for the position.
- You must document your skill in written English, for instance by a sole authored technical essay or published paper.

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 Philosodophiae Doctor (PhD) in artistic research national guidelines for appointment as PhD, post doctor and research assistant

Preferred selection criteria

- Knowledge of discrete mathematics, linear algebra, statistics and coding theory related to cryptography.
- Skills and experience in programming embedded systems and electronics laboratory work.
- Good written and oral English language skills.

Personal characteristics

- Strong motivation for research work.
- Ability for structured planning and ambition for high standards.
- Eager to disseminate research results through publications and presentations at international conferences, and through other venues of scientific communication.

Emphasis will be placed on personal interviews and invited presentations.

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, 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 4 years (including 25 % of the time for teaching duties).

Appointment to a PhD position requires that you are admitted to the PhD programme in Information Security and Communication Technology 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 follow 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 submitted your master's thesis, you want to attach a draft of the thesis. Documentation of a completed master's degree must be presented before taking up the position.
- Name and contact information of three referees
- Your publications or other relevant research documentation, if available

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 **Professor Stig F. Mjølsnes**, telephone +47 413 05 114, email stig.mjolsnes@ntnu.no. If you have any questions about the recruitment process, please contact **Solveig Grimstad**, e-mail: solveig.grimstad@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: 15.09.2023.

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 Information Security and Communication Technology

Research is vital to the security of our society. We teach and conduct research in cyber security, information security, communications networks and networked services. Our areas of expertise include biometrics, cyber defence, cryptography, digital forensics, security in e-health and welfare technology, intelligent transportation systems and malware. The Department of Information Security and Communication Technology is one of seven departments in the Faculty of Information Technology and Electrical Engineering .

Additional information

Place of service:
NTNU Campus Trondheim 7491 Trondheim (Trondheim Municipality)