Jobbnorge ID: 297312
Deadline: 4/24/2026
Website: http://www.ntnu.no
Scope: Fulltime
Duration: Project

The Department of Mathematical Sciences has a vacancy for a

PhD Candidate in Mathematical Foundations of Machine Learning for Sequential Data

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 position

A new PhD fellowship in path signatures, stochastic analysis, and learning from sequential data is available at the Department of Mathematical Sciences at the Norwegian University of Science and Technology (NTNU) in Trondheim. The project will be supervised by Prof. Kurusch Ebrahimi-Fard and is connected to the research activities of the national project SURE-AI.

The PhD project focuses on developing mathematical and computational methods based on path signatures and related algebraic and analytic structures for the analysis and modelling of complex sequential data. Path signatures, originating in stochastic integration and rough path theory, provide expressive representations of time-dependent data through sequences of iterated integrals and have recently gained significant attention in machine learning and data science. The project will investigate how these representations can be combined with concepts from physics-inspired machine learning, drawing on statistical physics, dynamical systems, and stochastic processes, to design robust, interpretable, and mathematically principled learning methods. Particular emphasis will be placed on learning from noisy, high-dimensional, and irregular data. Possible research directions include exploring connections between signature-based feature maps and emerging quantum-inspired or hybrid computational approaches to machine learning. Potential applications span time-series analysis, dynamical system modelling, and the data-driven study of stochastic phenomena.

The successful candidate will be offered a three-year PhD position at the Department of Mathematical Sciences, NTNU, with the main workplace in Trondheim, Norway. A six- to twelve-month extension with teaching duties may be offered. As a PhD Candidate with us, you will work toward your doctoral degree while gaining valuable experience that will prepare you for a career in research and higher education, within or beyond academia.

Your immediate leader will be the Head of Department.

About the project

SURE-AI: a National AI initiative: Six national research centres for Artificial Intelligence (AI) were launched in the Fall of 2025. These centres will foster interdisciplinary collaboration among researchers to address both scientific and societal challenges, develop new technologies, understand the impact of AI, and drive innovation across both the business and public sectors. This initiative is established and financed through the government's significant investment in artificial intelligence over the next five years.

SURE-AI is a Norwegian AI center funded by the Research Council of Norway (2025-2030). The primary objective is to create a new generation of algorithms for inference and decision-making by pushing the boundaries of the underlying computational techniques. SURE-AI researchers will drive a transformative leap in AI through a groundbreaking Centre initiative dedicated to making AI more efficient, transparent and safe, addressing the critical challenges of resource consumption, behavior unpredictability and ethical alignment with human and societal values. The centre involves senior researchers from well-renowned national and international research institutions, in close collaboration with industry and public sector. Overall, SURE-AI includes 19 national Norwegian partners, as well as researchers from 15 international institutions. More on the project at http://sure-ai.no.

Duties of the position

- Complete the doctoral education until obtaining a doctorate.
- Carry out research of high quality within the framework described above.
- Academic publications and popular science dissemination.
- Contribute in the SURE-AI project activities.
- Participate in the Differential Equations and Numerical Analysis (DNA) research group at IMF.
- Participate in international activities such as conferences, schools, and research stays at foreign educational institutions.
- Possibility for teaching and other career enhancing duties.

Be prepared for changes to your work duties after employment.

SURE-AI is firmly committed to excellence in both cutting-edge research and training of outstanding young researchers. Applicants are expected to familiarize themselves with the SURE-AI Excellence Expectation Alignment document. The appointed candidate is expected to demonstrate and uphold these standards and actively contribute to one or more of SURE-AI's work packages and innovation clusters, engage in collaboration across the SURE-AI network, and participate in all relevant center activities.

Required selection criteria

- Applicants must hold a relevant Master's degree in mathematics or equivalent. The degree must correspond to a five-year Norwegian programme of study, with at least 120 credits obtained at Master's level. Current Master's students are welcome to apply, provided that the degree is completed and documented prior to taking up the position, and no later than 30 October 2026.
- You must have a strong academic background from your previous studies and have an average grade from your Master's degree study, or equivalent education, which is equal to B or better compared to NTNU's grading scale. You must meet the requirements for admission to the faculty's Doctoral Programme.
- If you are in your master's program, integrated PhD could be an option. Your MSc grades after your fourth year need to be completed with a grade B or better, in addition the IE-faculty require that your Bachelor degree is completed with a grade C or better. For more information see: Integrated PhD - Faculty of Information Technology and Electrical Engineering - NTNU.
- Research oriented master thesis.
- Good oral and written presentation skills in English.

PLEASE NOTE: For detailed information about what the application must contain, see paragraph "About the application".

The appointment is to be made in accordance with NTNUs guidelines for recruitment positions and Regulations for the degrees philosophiae doctor (ph.d.) and philosophiae doctor (ph.d.) in artistic development work at the Norwegian University of Science and Technology (NTNU)for general criteria for the position.

Preferred selection criteria

- Good knowledge of stochastic analysis and/or advanced algebra or algebraic topology.
- Knowledge and experience of machine learning.

Personal characteristics

To complete a doctoral degree (PhD), it is important that you are able to:

- Work independently.
- High self-motivation.
- Work in a structured way, set goals and make plans to achieve them.
- Show curiosity and a strong motivation for the subject.
- Reflect upon your work with an open-minded attitude.
- Present and discuss your research with other professionals.
- Get involved and contribute constructively with feedback.
- Work constructively under pressure or in the face of adversity.
- Analyze data, assess different perspectives and draw well-founded conclusions.
- Be flexible and open to adjusting the plan for the project as needed.

Emphasis will be placed on personal qualities.

We offer

Evaluate and remove/add what is relevant for the position.

- An exciting job with an important mission in society.
- Developing tasks in a strong and international professional environment.
- Career guidance and follow-up during the PhD period.
- Open and inclusive working environment with committed colleagues.
- Working capital that can be used to implement the project.
- Favorable terms as a member of the Norwegian Public Service Pension Fund (SPK).
- Free Norwegian language training at a basic level (A2).

As a PhD Candidate at NTNU, you will have access to employee benefits.

Diversity

Diversity is a strength, and at NTNU we aim to be an employer that reflects the diversity in society and that makes use of the potential of the population's collective skills. Our vision is Knowledge for a better world and our values are creative, critical, constructive and respectful. We believe that an organization that is equal, diverse and gender-balanced is essential for us to achieve our goals.

We strive to attract employees with different skills, life experiences and perspectives to contribute to even better problem solving of our societal mission in research and education.

If you think this position is relevant and interesting, we encourage you to apply, regardless of gender, functional ability and cultural background, or whether you have been out of work for a period of time.

At NTNU we want to increase the proportion of women in scientific positions. We have a number of measures to promote equality.

Salary and conditions

In the position of PhD Candidate, code 1017, your gross salary will normally be NOK 550 800,-per annum depending on qualifications and seniority. A 2% statutory contribution to the State Pension Fund is deducted from the salary.

In case of an integrated PhD, you will be employed as a "vit. ass", code 1019, in a 50% position during the first 2 years. Your gross salary will normally start at NOK 490 000,- per annum. When the master degree of 30 credits is completed (with a grade of B or better), you will be employed as a PhD Candidate in code 1017 (see above).

The employment period is 3 years for the doctoral work. The department might be able to offer 6 to 12 months extension for career promotion work, depending on qualifications and motivation.

For employment as a PhD Candidate, it is a prerequisite that you gain admission to the PhD programme in mathematical sciences (https://www.ntnu.no/studier/phma) within three months of your employment contract start date, and that you participate in an organized doctoral programme through out the period of employment.

The position is conditional on external funding.

As an employee at NTNU, it is important that you keep yourself up to date with academic and organizational changes and adapt to them.

For the necessary professional and social interaction, it is a prerequisite that you are physically present and available to the institution on a daily basis.

The appointment is carried out in accordance with the principles of the State Employees Act, and Export control (legislation that regulates the export of knowledge, technology and services). Candidates who, after assessment of the application and attachments, are considered to bein conflict with the criteria in the latter act, will not be able to be employed.

About the application

The attachments (including a description of your scientific work) must accompany the application as these documents form the basis of the application assessment. The documents must be in Norwegian/a Scandinavian language or English.

Please note: the application will only be assessed on the basis of the information we have received by the application deadline. Therefore, make sure that your application clearly shows how your skills and experience meet the criteria described above. The application and all attachments must be sent electronically via Jobbnorge.no. If you are invited to an interview, you must bring certified copies of certificates and diplomas upon request.

The application must include:

- Transcripts and diplomas for Master's degrees and Bachelor`s degree (if applicable).
- CV.
- Copy of Master's thesis. If you have recently 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.
- Short letter of motivation (400 words/1 page).
- Possibly publications etc. other relevant research work.
- Names and contact information of three relevant 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, both Bachelor's and Master's education, in addition to other higher education. If your institution uses “diploma supplement” (normal for most European institutions), you must attach this. A description of the documentation required can also be found here. If you already have a statement from Norwegian Directorate for Higher Education and Skills (HK-dir), please attach this as well.

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

When assessing the best qualified, we emphasize necessary qualifications such as education, experience and personal suitability. Motivation for the position, ambitions, and potential for research will also count when assessing the candidates.

NTNU recognizes a wide range of academic contributions and has committed itself to The San Francisco Declaration on Research Assessment and CoARA (responsible assessment of research and recognition of a greater breadth of academic contributions in accordance with NTNU's social mission).

General information

A public list of applicants with name, age, job title and municipality of residence is prepared after the application deadline. If you wish to be exempt 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 exemption is not granted.

If you think this position looks interesting and in line with your qualifications, you are welcome to apply.

If you have any questions about the position, please contact Kurusch Ebrahimi-Fard (kurusch.ebrahimi-fard@ntnu.no).

Application deadline: 24.04.2026.

For practical information about working at NTNU, please visit this webpage.

The city of Trondheim is a modern European city with a rich cultural scene. Trondheim is the tech 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.

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 Mathematical Sciences

We are Norway's largest university environment in mathematical sciences.
The Department has a particular responsibility for all basis education in mathematical sciences for engineering and natural science students at NTNU. We focus on long-term basic research and applied research at a high international level.
Our aim is to meet the society's needs for mathematical and statistical expertise in business and public administration as well as in the research and education sector. The Department of Mathematical Sciences is one of seven departments in the Faculty of Information Technology and Electrical Engineering .

Additional information

Place of service:

Høgskoleringen 1 7491 Trondheim (Trondheim Municipality)