NTNU

Kunnskap for en bedre verden

Jobbnorge ID: 262711
Deadline: 5/29/2024
Website: http://www.ntnu.no
Scope: Fulltime
Duration: Temporary

The Department of Computer Science has a vacancy for a

PhD Candidate in Interpretable Machine Learning (The LABDA Project)

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

For a position as a PhD Candidate, the goal is a completed doctoral education up to an obtained doctoral degree.

The Department of Computer Science at the Norwegian University of Science and Technology (NTNU) is looking for applicants for a PhD scholarship within the Marie Skłodowska-Curie Doctoral Network 'Interpretable machine learning for 24/7 movement behaviour' funded by the European Union's Horizon Europe research and innovation programme (grant agreement No.101072993). The PhD project is expected to start in summer 2024 and employment will be for 36 months.

The LABDA project
LABDA (Learning Network for Advanced Behavioural Data Analysis) is an EU-funded MSCA Doctoral Network, that brings together leading researchers in advanced movement behaviour data analysis at the intersection of data science, method development, epidemiology, public health, and wearable technology to train a new generation of creative and innovative public health researchers via training-through-research. The main aim of LABDA is to establish novel methods for advanced 24/7 movement behaviour data analysis of sensor-based data, examine the added value of advanced behavioural data analysis and multi-modal data for predicting health risk and facilitate the use and interpretability of the advanced methods for application in science, policy, and society. Via training- through-research projects, 13 doctoral fellows will establish novel methods for advanced 24/7 movement behaviour data analysis and assess the added value of linking multimodal data. Together, they will develop a joint taxonomy to enable interoperability and data harmonisation. Results will be combined in an open source LABDA toolbox of advanced analysis methods, including a decision tree to guide researchers and other users to the optimal method for their (research) question. The open- source toolbox of advanced analysis methods will lead to optimised, tailored public health recommendations and improved personal wearable feedback concerning 24/7 movement behaviour. For more information, see the project's website: labda-project.eu

You will be hosted at the Department of Computer Science in the in the research unit Data and artificial intelligence (DART). NTNU offers an inspiring and professional environment in which developing one`s talents and skills is encouraged. We offer ample opportunity for development, deepening and broadening, additional training, and a place to grow!

Your immediate leader is the Head of DART group.

Duties of the position

As a PhD student in the project 'Interpretable machine learning for 24/7 movement behaviour' your challenge is to develop interpretable and explainable machine learning methods that use accelerometer data to describe 24/7 human behaviour. While existing methods focus on the performance of models, this project will investigate i) how the characterization of the input data can be used for describing the confidence of models, ii) how existing methods can be advanced to provide explanations (intrinsic or surrogate), and iii) the interpretability of the results.

Your research tasks:

- Use existing machine learning models (e.g. XGBoost, SVM, Transformer-based) and add explanation components.
- Develop new interpretable methods that describe the 24/7 movement patterns.
- Investigate feature importance and casual relationships of the machine learning models.
- Develop instructions to reproduce the approaches on other datasets (recorded with accelerometer sensors, but different subjects and positions).

- Integrating the results into the LABDA toolbox to make the developed software and models accessible to the public.

In addition to your local PhD training, you will participate in an attractive educational program customized to the 13 doctoral candidates in the LABDA project. The LABDA training program consists of 3 secondments (1 in Denmark, 2 in The Netherlands), monthly online trainings, 4 in-person 3-day workshops, and conferences to optimally develop your academic and transferable skills.

As part of the project, you will go on secondments including:

- Department of Sports Science and Clinical Biomechanics, University of Southern Denmark: to collaborate and prepare the submission of the results into the LABDA toolbox (collaborator Schipperijn).
- Department of Life Course and Health, Rijksinstituut voor Volksgezondheid en Milieu (The Netherlands): to describe how the developed machine learning models can be applied to public health (collaborator Picavet).
- Leiden Institute of Advanced Computer Science, Leiden University (The Netherlands): to align and compare the different approaches for interpretable machine learning (collaborator Kraaij).

Required selection criteria

- You must have a professionally relevant background in computer science, data science or a or a closely related discipline.
- Your education must correspond to a five-year Norwegian degree program, where 120 credits are obtained at master's level.
- You must have a strong academic background from your previous studies and an average grade from the master's degree program, or equivalent education, which is equal to B or better compared with NTNU's grading scale. If you do not have letter grades from previous studies, you must have an equally good academic basis. If you have a weaker grade background, you may be assessed if you can document that you are particularly suitable for a PhD education.
- You must meet the requirements for admission to the faculty's doctoral program.
- Must not already hold a doctoral degree.
- Must comply with the Marie Skłodowska-Curie Action mobility rule: not have resided or carried out their main activity (work, studies, etc.) in Norway for more than 12 months in the 3 years immediately before the recruitment date.

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

- Previous experience in analysing time series data (such as accelerometer data).
- Proficient with at least one programming language (e.g. Python [preferably], R, MATLAB).
- Preference to work in interdisciplinary research environment.
- Excellent communication and collaboration skills and fluent in English.

Personal characteristics

- Ability to work independently as well as in cross-disciplinary teams.
- Ability to interact and collaborate with actors in academia, public sector, and industry.
- Ability to thrive and contribute to the work environment.
- Be self-motivated, focused, and goal-oriented, be committed and keep deadlines, be flexible, reliable, and solution-orientated, be innovation-driven, enthusiastic, and ambitious.
- Be scientifically curious and open to new research challenges, demonstrate persistence in addressing technical problems.
- Good communication and dissemination skills.

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 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 3 years (without teaching duties).

Appointment to a PhD position requires that you are admitted to the PhD programme in Computer Science 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:

- Research statement (max. 3 pages) including:
  - A short presentation of the motivation for a PhD study.
  - How the applicant sees his/her background suitable for the position.
  - The applicant's view of research challenges for the selected PhD position, as well as his/her theoretical and methodological approach to the challenges.
- 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 have 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.
- Name and contact information of three referees.
- If you have publications or other relevant research work.

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.

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 prof. Kerstin Bach, telephone +4793032400, email kerstin.bach@ntnu.no. If you have any questions about the recruitment process, please contact HR at the Department, e-mail hr@idi.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: 29.05.24

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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 Computer Science

We are the leading academic IT environment in Norway, and offer a wide range of theoretical and applied IT programmes of study at all levels. Our subject areas include hardware, algorithms, visual computing, AI, databases, software engineering, information systems, learning technology, HCI, CSCW, IT operations and applied data processing. The Department has groups in both Trondheim and Gjøvik. The Department of Computer Science is one of seven departments in the Faculty of Information Technology and Electrical Engineering .

Additional information

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