PhD student in Computational Mathematics

We have the power of over 40,000 students and co-workers. Students who provide hope for the future. Co-workers who contribute to Linköping University meeting the challenges of the day. Our fundamental values rest on credibility, trust and security. By having the courage to think freely and innovate, our actions together, large and small, contribute to a better world. We look forward to receiving your application!

We are looking for a PhD student in Mathematical Sciences within the area of computational mathematics.

Your work assignments

As a PhD student, you devote most of your time to doctoral studies and the research projects of which you are part. Your work may also include teaching or other departmental duties, up to a maximum of 20% of full-time.

You will engage in cutting-edge research projects within the field of computational mathematics. You will have the opportunity to develop, analyze, and implement advanced computational methods at the intersection of **time-dependent partial differential equations, Bayesian statistics, inverse problems** with **uncertainty quantification, data assimilation,** and **scientific machine learning**. The specific project will be tailored to align with your interests, with examples including:

Example Project A: Developing and analyzing efficient and robust numerical methods for time-dependent partial differential equations. This project focuses on pioneering non-polynomial methods to address advection-dominated problems commonly encountered in computational fluid dynamics.

Example Project B: Efficient inference and uncertainty quantification for high-dimensional inverse problems, specifically in signaling and imaging applications. The focus will be on extending and applying recent methodological advances in sparsity-promoting priors within Bayesian scientific computing, particularly their integration with dimension reduction techniques and Bayesian neural networks.

Example Project C: Structure-preserving data assimilation for time-dependent partial differential equations in computational fluid dynamics. This project aims to combine recent developments in hierarchical Bayesian learning, measure transport, and numerical analysis to create enhanced predictive models for high-dimensional dynamic systems.

Regardless of the project you choose, you will collaborate with leading researchers in Sweden and internationally. Our group maintains active joint projects with institutions such as MIT and other Ivy League universities in the US. You will also benefit from numerous professional growth opportunities, including participation in international conferences, publishing in high-impact journals, gaining teaching and leadership experience, and engaging in grant writing and project management.

Moreover, you will have the chance to develop mentoring skills by co-supervising students. You will have access to state-of-the-art computational resources, including the National Supercomputer Centre at Linköping University, supporting your research endeavors. Finally, you will receive consistent and structured mentorship to address challenges and provide guidance.

Your qualifications

You have graduated at Master's level in mathematics or applied mathematics or completed courses with a minimum of 240 credits, at least 60 of which must be in advanced courses in mathematics or applied mathematics. These 60 credits must include independent work of least 30 credits in mathematics or applied mathematics. Alternatively, you have gained corresponding knowledge in another way. The requirement for a degree must be met no later than the time the employment decision is finalized, which occurs when the employment contract is signed.

You have a strong background in computational mathematics or a closely related field, such as computational statistics, physics, engineering, computer science, data science, or scientific machine learning.

You must be driven, ambitious and you want to strive for continuous development. You must also enjoy academic challenges and be motivated to acquire new knowledge and carry out research work. You are expected to be able to work independently, have the ability to take your own initiative, and have good cooperation skills. You should also thrive on academic challenges and be fluent in English, as you will be actively involved in international collaborations.

Finally, proficiency in Julia, Python, or Matlab is of merit especially in numerical solvers for time-dependent PDEs, Bayesian inferences (e.g., MCMC sampling), or data assimilation.

Your workplace

You will be employed at the Department of Mathematics in the Division of Applied Mathematics https://liu.se/en/organisation/liu/mai/tima. This provides an international work environment in which you will carry out teaching and research duties with individuals from all over the world.

The research group in Computational Mathematics has been one of the most active in Scandinavia over the past decade. The group is distinguished by working on fundamental mathematical and algorithmic topics in numerical analysis with various types of applications. The research group has a unique breadth with extensive activities in classical computational science areas such as numerical analysis for linear or nonlinear PDEs, development and analysis of stable algorithms, scientific software development, and high-performance computing.

The employment

When taking up the post, you will be admitted to the program for doctoral studies. More information about the doctoral studies at each faculty is available at Doctoral studies at Linköping University

The employment has a duration of four years' full-time equivalent. You will initially be employed for a period of one year. The employment will subsequently be renewed for periods of maximum duration two years, depending on your progress through the study plan. The employment may be extended up to a maximum of five years, based on the amount of teaching and departmental duties you have carried out. Further extensions can be granted in special circumstances.

Starting date by agreement.

Salary and employment benefits

The salary of PhD students is determined according to a locally negotiated salary progression.

More information about employment benefits at Linköping University is available here.

Union representatives

Information about union representatives, see Help for applicants.

Application procedure

Apply for the position by clicking the "Apply" button below. Your application must reach Linköping University no later than 28 October 2024.

Applications and documents received after the date above will not be considered.

We welcome applicants with different backgrounds, experiences and perspectives - diversity enriches our work and helps us grow. Preserving everybody's equal value, rights and opportunities is a natural part of who we are. Read more about our work with: Equal opportunities.

We look forward to receiving your application!

Linköping university has framework agreements and wishes to decline direct contacts from staffing- and recruitment companies as well as vendors of job advertisements.

Kontaktperson:

Martin Singull
Professor
martin.singull@liu.se
+46 13 285835

Jan Glaubitz
Assistant Professor
jan.glaubitz@liu.se
+46 13 28 28 87

Andrew Winters
Senior Associate Professor
andrew.ross.winters@liu.se
+4613281797

Madelaine Engström
Head of Administration
madelaine.engstrom@liu.se
+ 46 13 281401