Postdoctoral researcher positions in Probabilistic Machine Learning research group, Aalto University
Aalto University

Job Title	Postdoctoral researcher positions in Probabilistic Machine Learning research group, Aalto University
Department	T313 Dept. Computer Science
Institution	Aalto University , , Finland
Date Posted	Dec. 20, 2024
Application Deadline	Open until filled
Position Start Date	Available immediately
Job Categories	Post-Doc
Academic Field(s)	Computer Science
Job Website	https://aalto.wd3.myworkdayjobs.com/aalto/job/Otaniemi-Espoo-Finland/Postdoctoral-researcher-positions-in-Probabilistic-Machine-Learning-research-group--Aalto-University_R41807-4
Apply By Email	

Job Description

Samuel Kaski’s research group [url=https://research.cs.aalto.fi/pml/]Probabilistic Machine Learning is searching for postdocs to work on AI fundamentals in exciting projects. The work includes collaboration with the [url=https://fcai.fi]Finnish Center for Artificial Intelligence (FCAI), the [url=https://ai-fun.manchester.ac.uk]Centre for AI Fundamentals at the University of Manchester, the Alan Turing Institute, [url=https://ellis.eu]ELLIS and the new [url=https://fcai.fi/ellis-institute-finland]ELLIS Institute Finland, and researchers from other fields.

Prof Kaski is Professor of Computer Science in Aalto University and Professor of AI in the University of Manchester. He is Director of Finnish Center for Artificial Intelligence and ELLIS Unit Helsinki. His research group develops machine learning principles and methods focusing on a few key topics (see

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“Machine learning foundations” below), often working with researchers of other fields in new exciting applications (see the other topics below).
Topics

Machine learning foundations
Keywords: probabilistic modelling, Bayesian inference, simulation-based / likelihood-free inference, multi-agent RL and collaborative AI, sequential decision making and experimental design, privacy-preserving learning, Bayesian deep learning, generative models

We are looking for a new postdoc in the team which develops probabilistic modelling and Bayesian inference methods. The team has several exciting new machine learning formulations we work on, and opportunities for applying the methods with top-notch collaborators. The core is always development of new methods, and with this call we are looking for talented researchers with background in machine learning, stats or CS (or other directly relevant topics) who are keen on developing the new methods. In the cover letter, let us know what you are interested in - if we are already working on it, all the better, but we are willing to listen to new ideas too.

Machine learning for synthetic biology and biodesign
Keywords: AI-based design, human-in-the-loop machine learning, collaborative AI, molecular modeling, graph neural networks, deep learning algorithms, generative models

We are searching for early career scientists to join our research team working towards next-generation machine learning methods for synthetic biology. The positions are available in two large multi-year projects (BIODESIGN and BIOFOUNDRY) focused on establishing virtual laboratories for protein engineering and biomanufacturing, implemented in collaboration between FCAI and VTT Technical Research Centre of Finland, and [url=https://new.nsf.gov/news/nsf-international-partners-invest-82m-six-2024-global]NSF Global Center on biofoundries. The aim of the projects is to design novel AI-based tools for bioengineering. These tools will combine cutting edge machine learning techniques, such as graph neural networks, deep generative models, Bayesian optimization, and human-in-the-loop learning with the synthetic biology expertise of VTT. The virtual laboratories are envisioned to have a wide range of applications in industry (e.g., new biochemicals, biomaterials and drugs), and to help the transition to a carbon-neutral society.
Applicants should have a strong academic record in computer science, mathematics, or statistics. Solid research experience in one or more of the following fields is beneficial: AI-based design, Deep learning algorithms, Generative models, Human-in-the-loop machine learning, Collaborative AI, Molecular modeling, Reinforcement learning, Structured prediction.
The successful applicants will join a world-class research team with top AI researchers from FCAI and synthetic biology experts from VTT.

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Real-time AI-assistance with computationally rational user models
Keywords: collaborative AI, human-in-the-loop ML/RL, reinforcement learning, user modelling

Despite recent advances in AI and machine learning, there are few AI solutions that can be applied when we cannot precisely specify the objective or do not have suitable data to learn from. This is particularly salient and challenging in ad hoc assistance for human users in complex tasks such as scientific discovery.
This project aims to address this issue by learning these objectives, and to assist, directly from interaction with the users. To do so, we develop reinforcement learning techniques for AI-assistants and computationally rational user models that take into account factors such as cognitive biases to reason about human decision-making. We push state-of-the-art in AI that, through inference over - and planning with - such user models, is able to tackle problems that are otherwise out of reach of mainstream AI solutions.
Supported by a High-performance computing grant from the Research Council of Finland, we are looking to strengthen this team with postdocs with a strong academic record in computer science, mathematics, or statistics. Solid research experience in one or more of the fields listed under this topic is beneficial.
Team: this project will be carried out with a top expert on computational rationality, Prof. Andrew Howes of University of Exeter, and experts in application domains.

Next generation distribution shifts
Keywords: distribution shift, out-of-distribution generalization, robust deployment, deep learning, experimental design

Robust algorithms for machine learning models are vital as the deployed scenario can differ from the training scenario in unexpected ways. Placing assumptions on the kind of distribution shift we expect, such as covariate or label shift, and accounting for it during training is common practice. However, these assumptions are often too restrictive for real-world settings, as the shifts encountered are typically more complex. Moreover, it is difficult to know a priori which shifts we need to account for. This project focuses on developing novel machine learning methods that demonstrate robust performance by adapting to unforeseen shifts and diverse datasets during deployment.

We are looking for applicants with a strong academic record in computer science, mathematics, or statistics. Solid research experience in one or more of the following fields is beneficial: distribution shift, out-of-distribution generalization, out-of-domain generalization, sequential experimental design.
Your experience and ambitions

We expect the candidates to hold or be close to getting a relevant doctoral degree and have a solid

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background in the mathematics/statistics/computer science needed in machine learning.
Previous experience in the application fields is an advantage. Capability of both independent work and teamwork, and excellent written and spoken English are necessary.
What we offer
We provide
1) RESEARCH ENVIRONMENT
You will work in Professor Samuel Kaski's research group ([url=https://research.cs.aalto.fi/pml/]Probabilistic Machine Learning Group). We design collaborations as we go, according to what the research needs. Collaborators include but are not restricted to the other groups in the Finnish Center for Artificial Intelligence ([url=https://fcai.fi/researchers]FCAI), other sites of the European Laboratory for Learning and Intelligent Systems ([url=https://fcai.fi/ellis-unit-helsinki]ELLIS) and our new [url=https://fcai.fi/ellis-institute-finland]ELLIS Institute Finland, [url=https://ai-fun.manchester.ac.uk]Centre for AI Fundamentals of the University of Manchester, the Turing Institute, and a number of excellent researchers in other fields in our applications.
2) JOB DETAILS
Postdoc positions are typically made for up to three years. Starting dates are flexible. All positions are negotiated on an individual basis. We are strongly committed to offering everyone an inclusive and non-discriminating working environment. We warmly welcome qualified candidates from all backgrounds to apply and particularly encourage applications from women and other groups underrepresented in the field.
All our positions are fully funded and the salary is based on the Finnish universities' pay scale. The starting salary depends on the level of the position and the previous experience and is typically increased as the experience grows. All employees have access to the occupational health care services and are covered by the Finnish national health insurance system.
Ready to apply?
Submit your application through our recruitment system Workday by the link below. The deadline for applications is February 2 2025 at 23:59 Finnish time, 2024.

Required attachments
1) Cover letter (1-2 pages).
2) CV
3) List of publications (please do not attach full copies of publications)
4) A transcript of doctoral study
5) The degree certificate of your latest degree. If you don't yet have a PhD degree, a plan of completion must be submitted.
6) Contact details of two senior academics who can provide references. We will contact your referees if we need recommendation letters.
All materials should be submitted in English in a PDF format. Note: You can upload max. five files to

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the recruitment system, each max. 5MB.

Please note: Aalto University’s employees should apply for the position via our internal system Workday -> find jobs (not external aalto.fi webpage on open positions) by using their existing Workday user account.

Contacts: Coordinator Fang Wang (fang.wang@aalto.fi)
More Information
We are part of [url=https://fcai.fi/]Finnish Centre for Artificial Intelligence FCAI and [url=https://fcai.fi/ellis-unit-helsinki]ELLIS Unit Helsinki. More information on their pages, and the frequently asked questions on [url=https://fcai.fi/we-are-hiring]this page.

Aalto University (53rd in the Times Higher Education THE ranking list of most international universities in the world) is a community of bold thinkers where science and art meet technology and business. We are committed to identifying and solving grand societal challenges and building an innovative future. Aalto has six schools with nearly 12 000 students and a staff of more than 4000, of which 400 are professors. Our main campus is located in Espoo, Finland. Diversity is part of who we are, and we actively work to ensure our community’s diversity and inclusiveness. This is why we warmly encourage qualified candidates from all backgrounds to join our community.

The Department of Computer Science is an internationally-oriented community and home to world-class research in modern computer science, combining research on foundations and innovative applications. With over 40 professors and more than 450 employees from 50 countries, it is the largest department at Aalto University and the largest computer science unit in Finland. Computer science research at Aalto University ranks high in several prominent surveys (47th worldwide and 9th in Europe in Shanghai subject ranking 2019; and 56th worldwide in Times Higher Education subject ranking 2020).

About Finland
Finland is a great place for living with or without family - it is a safe, politically stable and well-organized Nordic society. Finland is consistently ranked high in quality of life and was just listed again as the happiest country in the world: [url=https://worldhappiness.report/news/its-a-three-peat-finland-keeps-top-spot-as-happiest-country-in-world/]https://worldhappiness.report/news/its-a-three-peat-finland-keeps-top-spot-as-happiest-country-in-world/. For more information about living in Finland: [url=https://www.aalto.fi/services/about-finland]https://www.aalto.fi/services/about-finland

More info:
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Contact Information

Please reference Academickeys in your cover letter when applying for or inquiring about this job announcement.

Contact

Finland