Postdoctoral Researchers or Research Fellows within Bayesian Inference for Medical Applications

The Sensor Informatics and Medical Technology (Sensori-informatiikka ja lääketieteellinen teknikka) research group focuses on the development of probabilistic (i.e. Bayesian) signal processing and machine learning methods especially for health and medical applications. Other applications include smartphone sensor fusion, robotics, positioning systems, target tracking, and many other indirectly measured systems. The used methods include sensor fusion and machine learning methods such as nonlinear Kalman filtering and smoothing, particle filtering and smoothing, Markov chain Monte Carlo (MCMC), Bayesian data analysis, kernel methods, (deep and shallow) Gaussian processes (GP), neural networks, and other non-linear regressors and classifiers.

We are looking for

Postdoctoral Researchers or Research Fellows within Bayesian Inference for Medical Applications

The positions belong to the Aalto career system and the selected person will be appointed for a fixed term appointment starting in late 2017 or early 2018. The work will be done under guidance of Prof. Simo Särkkä.

The position is available in the growing Sensor Informatics and Medical Technology research group. We aim to carry out original high-quality research and continuously publish in top journals and conferences of the field. We have an extensive international collaboration network, which will facilitate the mobility of our researchers to leading research groups abroad, and vice versa. Our group is located at the Department of Electrical Engineering and Automation at Aalto University in Helsinki capital region.

Possible research topics include:

- Bayesian filtering and machine learning methods for automated diagnosis of cardiac diseases. Promising methods have been, for example, Kalman filters and Gaussian process classifiers, deep models could also be used.
- Sensor fusion methods for motion tracking and positioning. The used sensors include, e.g., inertial and magnetic sensors, and the methodology typically includes non-linear Kalman filters and particle filters along with methods like MCMC.
- New computational methods and models for highly non-linear and non-Gaussian spatio-temporal stochastic systems. This kind of methods can be based on, for example, nonlinear Kalman-type of methods, expectation-propagation, posterior-linearization, EP, sigma-point methods, or sequential Monte Carlo.
- New computational methods and models for machine learning for signal processing. Examples of such methods and models are state-space GP methods, SPDE methods for GPs as well as hierarchical / deep models, probabilistic programming languages, graphical methods etc.
Responsibilities

In addition to research work, persons hired are expected to participate in the supervision of students and teaching following the standard practices at the department.

Qualifications

Applicants are expected to have an excellent research track record in Bayesian filtering, probabilistic machine learning and/or the application fields. Good command of English, doctoral degree and a good academic publication record are necessary prerequisites.

To qualify for a research fellow, applicants are expected to have in addition external experience as postdoc or equivalent experience from industry, teaching experience and teaching portfolio.

Compensation, working hours and place of work

The salary for a post-doc position is between 3 500 and 3 800 EUR per month depending on experience and qualifications and for the research fellows the salary is higher, but needs to be negotiated case-by-case, both depending on experience and qualifications. In addition to the salary, the contract includes occupational health benefits, and Finland has a comprehensive social security system. The annual total workload of teaching staff at Aalto University is 1 624 hours. The position is located at the Aalto University Otaniemi campus.

Application material and procedure

Please send your application in a single PDF file through the electronic recruitment system (link: http://www.aalto.fi/en/about/careers/jobs/view/1524/) no later than October 31, 2017, Finnish time. Early submission is strongly encouraged, as applications will be processed and evaluated upon arrival. Include your CV, list of publications, and names and contact information of two senior academics willing to give more information. Applicants for research fellow position should include also a teaching portfolio.

Short-listed candidates may be invited for an interview on the Otaniemi campus of Aalto University in Espoo or for an interview conducted via Skype. The candidates must have completed their PhD degree before the start of the contract period. Should there be a lack of eligible outstanding applicants, Aalto University reserves the right to leave the position open, to extend the application period and to consider candidates who have not submitted applications during the application period.

Further information

HR Coordinator, Ms. Jaana Hänninen, e-mail "jaana.hanninen@aalto.fi" (application process, practical arrangements).
Professor Simo Särkkä, e-mail "simo.sarkka@aalto.fi" (research related information)
Espoo, September 15, 2017

**About Helsinki and Aalto University**

The greater Helsinki region is a world-class information technology complex, attracting leading scientists and researchers in various fields of computer science. Helsinki is regularly highly graded in world city rankings, such as global livability ranking by The Economist (Ranked eighth in 2014). As a postdoctoral fellow you will enjoy sophisticated, high-quality and vibrant life of Nordic charm.

Aalto University 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 University has six schools with nearly 20,000 students and more than 400 professors.