Eero Siivola

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Academic Curriculum Vitæ
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Education

15.2.2016 **Master of Science degree (with distinction), Aalto University, Espoo, Finland**.
Degree programme: Automation and Systems Technology, **Major subject**: Signal Processing and Control Engineering in Industrial Automation, **Minor subject**: Information and Computer Science, **Thesis**: Requirement verification in simulation-based automation testing, **GPA**: 4.93/5,
More info: studies-elec@aalto.fi

15.12.2014 **Bachelor of Science degree (with distinction), Aalto University, Espoo, Finland**.
Degree programme: Automation and Systems Technology, **Major subject**: Automation and Systems Technology, **Minor subject**: Information Technology,
Thesis: Soft Sensors in Mineral Processing, **GPA**: 4.87/5

Language skills

Finnish: First language
English (Europass self-assessment): Understanding, C1, Speaking, C1, Writing, C1
Swedish (Europass self-assessment): Understanding, B1, Speaking, A2, Writing, A2

Work experience

8/2020- **Senior Research Scientist, Finnish Environment Institute (SYKE), Helsinki, Finland**.
Research career stage: R2: Recognised Researcher
I work in Programme for Environmental Information as a machine learning specialist

1/2016 -10/2021 **Doctoral student, Aalto University, Espoo, Finland**.
Research career stage: R1, First Stage Researcher
I work as a doctoral candidate in Probabilistic Machine Learning –group. My research is related to different probabilistic modelling techniques. Recently, I have been studying Gaussian Processes and Bayesian Optimization. My supervisor is Prof. Aki Vehtari. I am defending my thesis on October 2021.

In addition to research, as a part of the doctoral degree, I have completed various courses related to deep learning, Bayesian modeling, information visualization, measure theory and communication skills.

Most of the research outcomes can be found from arXiv and GitHub.

9/2017- **Data analyst and co-founder, Enne Analytics, Espoo, Finland**.
We founded a consultancy company with a few collegues from the same research group to get more insight on practical data analysis problems in the industry. Our projects have been related e.g. to predicting errors from measurement timeseries, doing Bayesian A/B testing and we have also organized machine learning workshops for companies.

5–8/2019 **Applied scientist intern, Amazon.com, Cambridge, United Kingdom**.
Research career stage: R1, First Stage Researcher
During the internship, I studied how variational autoencoders can be used in high dimensional Bayesian optimization. The collaboration continues and we are currently publishing a paper of the findings.

5–7/2018 **Doctoral student, Novartis, Basel, Switzerland**.
Research career stage: R1, First Stage Researcher
During the internship, I studied how can non-parametric regression methods be used to find out how a model describing drug behavior in a body differs between adults and kids. The studied method was tested with a real medical data and the early stage results are promising. The collaboration has continued after the visit and we are currently publishing an article of the research outcomes of the project.

4–12/2015 **Master's thesis worker, VTT Technical Research Centre of Finland, Espoo, Finland**.
I worked as a master's thesis worker in a team focusing on systems modelling and simulation. A Java based tool that automatically monitors requirements imposed on the simulation system was developed during the employment.

Publications

Peer-reviewed

2021 E. Siivola, A. K. Dhaka, M. R. Andersen, J. González, P. G. Moreno and A. Vehtari. "Preferential Batch Bayesian Optimization". *IEEE 31st International Workshop on Machine Learning for Signal Processing (MLSP)*. Online: https://arxiv.org/abs/2003.11435

2021 E. Siivola, A. Paleyes, J. González and A. Vehtari. "Good practices for Bayesian optimization of high dimensional structured spaces", *Applied AI letters*. Online: https://onlinelibrary.wiley.com/doi/full/10.1002/ail2.24

2021 E. Siivola, S. Weber and A. Vehtari. "Qualifying drug dosing regimens in pediatrics using Gaussian Processes", *Statistics in Medicine*. Online: https://onlinelibrary.wiley.com/doi/full/10.1002/sim.8907

2019 I. Sundin, P. Schulam*, E. Siivola*, A. Vehtari, S. Saria and S. Kaski. "Active Learning for Decision-Making from Imbalanced Observational Data" *Proceedings of the 36th International Conference on Machine Learning (ICML)*. *Equal contribution. Online: https://arxiv.org/abs/1904.05268

2018 S. Holmbacka, J. Niemelä, H. Karikallio, K. Sunila, I. Raiskinen, E. Siivola, J. Piironen and T. Sivula. "Alarm Prediction in LTE Networks" *IEEE 25th International Conference on Telecommunications (ICT)*. Online: https://ieeexplore.ieee.org/document/8464882

2018 E. Siivola, A. Vehtari, J. Vanhatalo and J. González. "Correcting boundary over-exploration deficiencies in Bayesian optimization with virtual derivative sign observations". *IEEE 28th International Workshop on Machine Learning for Signal Processing (MLSP)*. Online: https://arxiv.org/abs/1704.00963

2016 E. Siivola, S. Sierla, H. Niemistö, T. Karhela and V. Vyatkin. "Requirement verification in simulation-based automation testing", *IEEE 14th International Conference on Industrial Informatics (INDIN)*. Online: https://arxiv.org/abs/1602.02504

Non peer-reviewed

2016 E. Siivola, J. Piironen and A. Vehtari. "Automatic monotonicity detection for Gaussian Processes". Online: https://arxiv.org/abs/1610.05440

Workshop contributions

2018 M. R. Andersen, E. Siivola, G. Riutort-Mayol and A. Vehtari."A non-parametric probabilistic model for monotonic functions". BNP@NeurIPS 2018 workshop: "All of Bayesian Nonparametrics (Especially the Useful Bits)". Online: https://drive.google.com/file/d/19kHhfuYC22ymNt3a3BlYgW0vWexOmbNy

2017 M. R. Andersen, E. Siivola and A. Vehtari. "Bayesian Optimization of Unimodal Functions". NIPS Workshop in Bayesian optimization for Science and Engineering. Online: https://bayesopt.github.io/papers/2017/9.pdf

Teaching

2016-2019 **Course assistant, Bayesian data analysis course, Aalto University, Espoo, Finland**.

2014 **Course assistant, analog control course Aalto University, Espoo, Finland**.

IT skills

languages **Python**, **Java**, **Matlab**, **C++**, **C**, **C#**, **Stan**, **R**, **LaTeX**, **SQL**, **XML**, **JavaScript**, **bash shell scripting**

tools **VisualStudio**, **Eclipse**, **git**, **AWS**

Finnish Military service

7/2010 –7/2011 **Non-commissioned officer in artillery, Kainuu Brigade, Kajaani, Finland**.