Christian Andersson Naesseth

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CV Updated: November, 2024

Employment

Assistant Professor — University of Amsterdam
Amsterdam Machine Learning Lab — 2022 Jan – Present

Postdoctoral Research Scientist — Columbia University
Data Science Institute — 2019 Aug – 2021 Dec
Advisor: David M. Blei

Postdoctoral Researcher — Linköping University
Department of Computer and Information Science — 2019 Jan – 2019 Jul
Advisor: Fredrik Lindsten

Research Intern — Microsoft Research Ltd
Machine Intelligence & Perception — 2018 Apr – 2018 Jul
Supervisor: Sebastian Nowozin

Fulbright Visiting Student Researcher — Columbia University
Data Science Institute — 2016 Jun – 2017 Jul
Advisor: David M. Blei

Teaching Assistant — Linköping University
Department of Electrical Engineering — 2011 Aug – 2018 Dec

Education

Ph.D. Electrical Engineering with Specialization in Automatic Control — 2019
Linköping University
Dissertation: *Machine learning using approximate inference: Variational and SMC methods*
Advisors: Thomas B. Schön, Fredrik Lindsten

M.Sc. Applied Physics and Electrical Engineering — 2013
Linköping University
Thesis: *Vision and Radar Sensor Fusion for Advanced Driver Assistance Systems*

B.Sc. Mathematics — 2012
Linköping University
Thesis: *Nowcasting using Microblog Data*
Exchange visit: Beijing Institute of Technology (2011/2012)

Honors and Awards

Savage Award — 2019
International Society for Bayesian Analysis (ISBA)
Outstanding dissertation in Theory and Methods: *Machine learning using approximate inference: Variational and sequential Monte Carlo methods*

Best Reviewer Award — 2017
Neural Information Processing Systems (NeurIPS)

Best Paper Award — 2017
International Conference on Artificial Intelligence and Statistics (AISTATS)
Reparameterization Gradients through Acceptance–Rejection Algorithms

Fulbright Scholarship 2016
Fulbright Commission

Research Scholarships 2016
Ericsson Research Foundation, Gålöstiftelsen, Bernt Järmarks stiftelse

Best Poster Award 2014
Summer School on Deep Learning for Image Analysis
Sequential Monte Carlo for Graphical Models

Research Funding

Principal Investigator

Generative models and uncertainty quantification in machine learning 2025 – 2026
Gift funding for 1 postdoc from the Bosch Group (80%) & Scyfer (20%).

Co-Investigator

UvA-Bosch Delta Lab 2021 – 2026
Gift funding for 10 PhD students from the Bosch Group.
Role: Lab manager, PhD co-supervisor.
PIs: Theo Gevers, Jan-Willem van de Meent.

Academic Supervision

PhD Candidates

Rajeev Verma (with Eric Nalisnick) 2024 –
University of Amsterdam

Alexander Timans (with Eric Nalisnick) 2024 –
University of Amsterdam

Heiko Zimmermann (with Jan-Willem van de Meent) 2022 –
University of Amsterdam

Grigory Bartosh 2022 –
University of Amsterdam

Visiting Students

University of Amsterdam: Raghuram D R (2024), François Cornet (2024).

Master Students

University of Amsterdam: Jonathan Hombroek (2024), Doris Wezenberg (2024).

Linköping University: Elina Fantenberg (2018), Martin Lindfors (2014), Olle Noren (2014), Alfred Dahlin (2014).

Publications

F. Cornet, G. Bartosh, M. Schmidt, and C. A. Naesseth. Equivariant neural diffusion for molecule generation. In *Advances in Neural Information Processing Systems (NeurIPS) 37*, 2024. (accepted for publication).

F. Eijkelboom*, G. Bartosh*, C. A. Naesseth, M. Welling, and J-W. van de Meent. Variational flow matching for graph generation. In *Advances in Neural Information Processing Systems (NeurIPS) 37*, 2024. * equal contribution (accepted for publication).

H. Yang, A. K. Moretti, S. Macaluso, P. Chlenski, C. A. Naesseth, and I. Pe'er. Variational pseudo marginal methods for jet reconstruction in particle physics. *arXiv:2406.03242*, 2024.

M. Jazbec*, A. Timans*, T. H. Veljković, K. Sakmann, D. Zhang, C. A. Naesseth, and E. Nalisnick. Fast yet safe: Early-exiting with risk control. In *Advances in Neural Information Processing Systems (NeurIPS) 37*, 2024. * equal contribution (accepted for publication).

G. Bartosh, D. Vetrov, and C. A. Naesseth. Neural flow diffusion models: Learnable forward process for improved diffusion modelling. In *Advances in Neural Information Processing Systems (NeurIPS) 37*, 2024a. (accepted for publication).

H. Zimmermann, C. A. Naesseth, and J-W. van de Meent. VISA: Variational inference with sequential sample-average approximations. In *Advances in Neural Information Processing Systems (NeurIPS) 37*, 2024. (accepted for publication).

G. Bartosh, D. Vetrov, and C. A. Naesseth. Neural diffusion models. In *Proceedings of the 41st International Conference on Machine Learning (ICML)*, Vienna, Austria, Jul 2024b.

T. Pandeva, T. Bakker, C. A. Naesseth, and P. Forré. E-valuating classifier two-sample tests. *Transactions on Machine Learning Research*, 2024.

L. Wu, B. L. Trippe, C. A. Naesseth, D. M. Blei, and J. P. Cunningham. Practical and asymptotically exact conditional sampling in diffusion models. In *Advances in Neural Information Processing Systems (NeurIPS) 36*, 2023.

L. Zhang, D. Blei, and C. A. Naesseth. Transport score climbing: Variational inference using forward KL and adaptive neural transport. *Transactions on Machine Learning Research*, 2023.

H. Zimmermann, F. Lindsten, J-W. van de Meent, and C. A. Naesseth. A variational perspective on generative flow networks. *Transactions on Machine Learning Research*, 2023.

A. K. Moretti, L. Zhang, C. A. Naesseth, H. Venner, D. Blei, and I. Pe'er. Variational combinatorial sequential Monte Carlo methods for Bayesian phylogenetic inference. In *Uncertainty in Artificial Intelligence (UAI)*, 2021.

C. A. Naesseth, F. Lindsten, and D. Blei. Markovian score climbing: Variational inference with KL(p||q). In *Advances in Neural Information Processing Systems (NeurIPS) 33*, Vancouver, Canada, 2020.

D. Biderman, C. A. Naesseth, L. Wu, T. Abe, A. C. Mosberger, L. J. Sibener, R. M. Costa, J. Murray, and J. Cunningham. Inverse articulated-body dynamics from video via variational sequential Monte Carlo. In *First workshop on differentiable computer vision, graphics, and physics in machine learning (NeurIPS)*, Vancouver, Canada, 2020.

M. Lindfors, T. Chen, and C. A. Naesseth. Robust Gaussian process regression with G-confluent likelihood. In *21th IFAC World Congress*, Germany, 2020.

C. A. Naesseth, F. Lindsten, and T. B. Schön. Elements of sequential Monte Carlo. *Foundations and Trends® in Machine Learning*, 12(3):307–392, November 2019a. Now Publishers, Inc.

C. A. Naesseth, F. Lindsten, and T. B. Schön. High-dimensional filtering using nested sequential Monte Carlo. *IEEE Transactions on Signal Processing*, 67(16):4177–4188, August 2019b.

C. A. Naesseth. *Machine learning using approximate inference: Variational and sequential Monte Carlo methods*. PhD thesis, Linköping University, 2018. **(Savage Award for outstanding dissertation in Theory and Methods)**.

D. Lawson, G. Tucker, C. A. Naesseth, C. J. Maddison, R. P. Adams, and Y. W. Teh. Twisted variational sequential Monte Carlo. In *Third workshop on Bayesian Deep Learning (NeurIPS)*, Montreal, Canada, 2018.

C. A. Naesseth, S. W. Linderman, R. Ranganath, and D. M. Blei. Variational sequential Monte Carlo. In *Proceedings of the 21st International Conference on Artificial Intelligence and Statistics (AISTATS)*, Lanzarote, Spain, Apr 2018.

C. A. Naesseth, F. J. R. Ruiz, S. W. Linderman, and D. M. Blei. Reparameterization gradients through acceptance–rejection algorithms. In *Proceedings of the 20th International Conference on Artificial Intelligence and Statistics (AISTATS)*, Fort Lauderdale, USA, Apr 2017. **(Best Paper Award)**.

F. Lindsten, A. M. Johansen, C. A. Naesseth, B. Kirkpatrick, T. B. Schön, J. Aston, and A. Bouchard-Côté. Divide-and-conquer with sequential Monte Carlo. *Journal of Computational and Graphical Statistics*, 2016.

T. Rainforth*, C. A. Naesseth*, F. Lindsten, B. Paige, J-W. van de Meent, A. Doucet, and F. Wood. Interacting particle Markov chain Monte Carlo. In *Proceedings of the 33rd International Conference on Machine Learning (ICML)*, New York, USA, Jun 2016. * equal contribution.

C. A. Naesseth, F. Lindsten, and T. B. Schön. Towards automated sequential Monte Carlo methods for probabilistic graphical models. In *NIPS Workshop on Black Box Learning and Inference*, Montreal, Canada, 2015a.

T. B. Schön, F. Lindsten, J. Dahlin, J. Wågberg, C. A. Naesseth, A. Svensson, and L. Dai. Sequential Monte Carlo Methods for System Identification. In *Proceedings of the 17th IFAC Symposium on System Identification (SYSID)*, Beijing, China, 2015.

C. A. Naesseth, F. Lindsten, and T. B. Schön. Nested Sequential Monte Carlo Methods. In *Proceedings of the 32nd International Conference on Machine Learning (ICML)*, Lille, France, Jul 2015b.

C. A. Naesseth, F. Lindsten, and T. B Schön. Sequential Monte Carlo for Graphical Models. In *Advances in Neural Information Processing Systems (NIPS) 27*, pages 1862–1870, Montreal, Canada, 2014a.

C. A. Naesseth, F. Lindsten, and T. B. Schön. Capacity estimation of two-dimensional channels using sequential Monte Carlo. In *Proceedings of the 2014 IEEE Information Theory Workshop (ITW)*, pages 431–435, Hobart, Australia, Nov 2014b.

Invited Talks

Diffusions, flows, and other stories 2024
NeurIPS Fest (keynote) University of Amsterdam

There And Back Again: A Forward Diffusion Tale 2024
Generative models and uncertainty quantification GenU

Generative Models and Approximate Bayesian Inference 2024
Special Invited Session: Bayesian computational methods COMPSTAT

There And Back Again: A Diffusion's Tale 2024
Industry-on-Campus Lab (seminar) Bosch Center for AI and University of Tübingen

Twisted Diffusion Sampling for Accurate Conditional Generation 2023
Plenary talk ELLIS unConference

Monte Carlo and Variational Methods: Bridging the Gap 2022
Special Invited Session: Grand challenges and advances in Bayesian computation CMStatistics

Monte Carlo and Variational Methods: Bridging the Gap 2022
Workshop on Monte Carlo and Approximate Dynamic Programming Methods ESSEC Paris

Variational Bayes Goes to Monte Carlo 2021
Amsterdam Machine Learning lab (seminar) University of Amsterdam

Machine learning using approximate inference 2020
Savage Award session (contributed talk) Joint Statistical Meeting

Machine learning using approximate inference 2020
Junior Bayes Beyond the Borders (webinar) Bocconi University

Variational and Monte Carlo methods 2019

Center for Industrial and Applied Mathematics (seminar) KTH

Variational and Monte Carlo methods 2019
Department of Mathematical Sciences (seminar) Chalmers

Variational inference 2018
Department of Information Technology (tutorial) Uppsala University

Approximate Bayesian inference: Variational and MC methods 2017
Department of Computer Science (seminar) Linköping University

Monte Carlo methods and proper weighting 2015
Department of Engineering Science (tutorial) The University of Oxford

Nested Sequential Monte Carlo Methods 2015
SMC Workshop ENSAE Paris

Sequential Monte Carlo for Probabilistic Graphical Models 2014
School of Mathematics and Statistics (seminar) University of NSW

Sequential Monte Carlo for Probabilistic Graphical Models 2014
School of Electrical Engineering and Computer Science (seminar) University of Newcastle

Teaching

Digital Expertise: Introduction to ML (Undergraduate) 2024
Guest lecturer University of Amsterdam

Reinforcement Learning (Graduate) 2024 – 2025
Lecturer University of Amsterdam

Introduction to Machine Learning (Undergraduate) 2022 – 2024
Lecturer University of Amsterdam

Foundations of Graphical Models (Graduate) 2019
Guest lecturer Columbia University

Sensor Fusion (Graduate) 2015 – 2016
Recitation instructor, teaching and lab assistant Linköping University

Digital Signal Processing (Graduate) 2014
Lab assistant Linköping University

Industrial Control Systems (Graduate) 2014
Recitation instructor, teaching and lab assistant Linköping University

Control Project Laboratory (Graduate) 2014 – 2018
Project supervisor Linköping University

Modeling and Simulation (Graduate) 2013 – 2015
Recitation instructor, teaching and lab assistant Linköping University

Engineering Project (Undergraduate) 2013
Project supervisor Linköping University

Automatic Control (Undergraduate) 2012 – 2014
Recitation instructor, teaching and lab assistant Linköping University

Foundation Course in Mathematics (Undergraduate) 2011
Recitation instructor and teaching assistant Linköping University

Professional Service

Organisation

Symposium on Advances in Approximate Bayesian Inference 2023 – 2024
Co-organizer, Program Chair AABI

International Conference on Artificial Intelligence and Statistics 2023
Workflow Chair AISTATS

Senior Program Committee

Conference on Uncertainty in Artificial Intelligence 2024
Area Chair UAI

International Conference on Artificial Intelligence and Statistics 2024 – 2025
Senior Area Chair AISTATS

International Conference on Artificial Intelligence and Statistics 2022
Area Chair AISTATS

Reviewing

Dutch Research Council (NWO) 2024

Journal of Machine Learning Research (JMLR) 2020 – 2021

Neural Information Processing Systems (NeurIPS) 2017 – 2020

International Conference on Machine Learning (ICML) 2017 – 2018

International Conference on Learning Representations (ICLR) 2017

International Conference on Artificial Intelligence and Statistics (AISTATS) 2017 – 2018

Doctoral Committees

Gabriel Bénédict 2024
A Machine Learning Personalization Flow University of Amsterdam

Salem Lahlou 2023
Advances in uncertainty modelling: from epistemic uncertainty estimation to generalized generative flow networks Université de Montréal, MILA

Professional Development

University Teaching Qualification (BKO) 2024
University of Amsterdam

Leadership Course for Tenure Trackers 2022
Center for Academic Leadership University of Amsterdam

Learning and Knowledge 2016
Advanced course in higher education pedagogy Linköping University