

# CHRISTIAN ANDERSSON NÆSSETH

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## EMPLOYMENT

<b>Assistant Professor</b> Amsterdam Machine Learning Lab	University of Amsterdam 2022 Jan – Present
<b>Postdoctoral Research Scientist</b> Data Science Institute Advisor: David M. Blei	Columbia University 2019 Aug – 2021 Dec
<b>Postdoctoral Researcher</b> Department of Computer and Information Science Advisor: Fredrik Lindsten	Linköping University 2019 Jan – 2019 Jul
<b>Research Intern</b> Machine Intelligence & Perception Supervisor: Sebastian Nowozin	Microsoft Research Ltd 2018 Apr – 2018 Jul
<b>Fulbright Visiting Student Researcher</b> Data Science Institute Advisor: David M. Blei	Columbia University 2016 Jun – 2017 Jul
<b>Teaching Assistant</b> Department of Electrical Engineering	Linköping University 2011 Aug – 2018 Dec

## EDUCATION

<b>Ph.D.</b> Electrical Engineering <b>Linköping University</b> Dissertation: <i>Machine learning using approximate inference: Variational and SMC methods</i> Advisors: Thomas B. Schön, Fredrik Lindsten	2019
<b>M.Sc.</b> Applied Physics and Electrical Engineering <b>Linköping University</b> Thesis: <i>Vision and Radar Sensor Fusion for Advanced Driver Assistance Systems</i>	2013
<b>B.Sc.</b> Mathematics <b>Linköping University</b> Thesis: <i>Nowcasting using Microblog Data</i>	2012

## HONORS AND AWARDS

<b>Savage Award</b> International Society for Bayesian Analysis (ISBA) Outstanding dissertation in Theory and Methods: <i>Machine learning using approximate inference: Variational and sequential Monte Carlo methods</i>	2019
<b>Best Reviewer Award</b> Neural Information Processing Systems (NeurIPS)	2017
<b>Best Paper Award</b> International Conference on Artificial Intelligence and Statistics (AISTATS) <i>Reparameterization Gradients through Acceptance-Rejection Algorithms</i>	2017

<b>Fulbright Scholarship</b> Fulbright Commission	2016
<b>Research Scholarships</b> Ericsson Research Foundation, Gålostiftelsen, Bernt Järmarks stiftelse	2016
<b>Best Poster Award</b> Summer School on Deep Learning for Image Analysis <i>Sequential Monte Carlo for Graphical Models</i>	2014

## RESEARCH FUNDING

### CO-INVESTIGATOR

<b>UvA-Bosch Delta Lab</b> Gift funding for 10 PhD students and 1 postdoc from the Bosch Group. Role: Lab manager, postdoc advisor, PhD co-supervisor. PIs: Theo Gevers, Jan-Willem van de Meent.	2021-2026
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## PUBLICATIONS

- G. Bartosh, D. Vetrov, and C. A. Naesseth. Neural flow diffusion models: Learnable forward process for improved diffusion modelling. *arXiv:2404.12940*, 2024.
- H. Zimmermann, C. A. Naesseth, and JW van de Meent. VISA: Variational inference with sequential sample-average approximations. *arXiv:2403.09429*, 2024.
- T. Pandeva, T. Bakker, C. A. Naesseth, and P. Forré. E-evaluating classifier two-sample tests. *Transactions on Machine Learning Research*, 2024.
- G. Bartosh, D. Vetrov, and C. A. Naesseth. Neural diffusion models. *arXiv:2310.08337*, 2023.
- 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, JW 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

<b>There And Back Again: A Diffusion’s Tale</b>	2024
Industry-on-Campus Lab (seminar)	Bosch Center for AI and University of Tübingen
<b>Twisted Diffusion Sampling for Accurate Conditional Generation</b>	2023
Plenary talk	ELLIS unConference
<b>Monte Carlo and Variational Methods: Bridging the Gap</b>	2022
Special Invited Session: Grand challenges and advances in Bayesian computation	CMStatistics
<b>Monte Carlo and Variational Methods: Bridging the Gap</b>	2022
Workshop on Monte Carlo and Approximate Dynamic Programming Methods	ESSEC Paris
<b>Variational Bayes Goes to Monte Carlo</b>	2021
Amsterdam Machine Learning lab (seminar)	University of Amsterdam
<b>Machine learning using approximate inference</b>	2020
Savage Award session (contributed talk)	Joint Statistical Meeting

<b>Machine learning using approximate inference</b>	2020
Junior Bayes Beyond the Borders (webinar)	Bocconi University
<b>Variational and Monte Carlo methods</b>	2019
Center for Industrial and Applied Mathematics (seminar)	KTH
<b>Variational and Monte Carlo methods</b>	2019
Department of Mathematical Sciences (seminar)	Chalmers
<b>Variational inference</b>	2018
Department of Information Technology (tutorial)	Uppsala University
<b>Approximate Bayesian inference: Variational and MC methods</b>	2017
Department of Computer Science (seminar)	Linköping University
<b>Monte Carlo methods and proper weighting</b>	2015
Department of Engineering Science (tutorial)	The University of Oxford
<b>Nested Sequential Monte Carlo Methods</b>	2015
SMC Workshop	ENSAE Paris
<b>Sequential Monte Carlo for Probabilistic Graphical Models</b>	2014
School of Mathematics and Statistics (seminar)	University of NSW
<b>Sequential Monte Carlo for Probabilistic Graphical Models</b>	2014
School of Electrical Engineering and Computer Science (seminar)	University of Newcastle

## TEACHING

<b>Introduction to Machine Learning</b> (Undergraduate)	2022 – 2024
Lecturer	University of Amsterdam
<b>Foundations of Graphical Models</b> (Graduate)	2019
Guest lecturer	Columbia University
<b>Sensor Fusion</b> (Graduate)	2015 – 2016
Recitation instructor, teaching and lab assistant	Linköping University
<b>Digital Signal Processing</b> (Graduate)	2014
Lab assistant	Linköping University
<b>Industrial Control Systems</b> (Graduate)	2014
Recitation instructor, teaching and lab assistant	Linköping University
<b>Control Project Laboratory</b> (Graduate)	2014 – 2018
Project supervisor	Linköping University
<b>Modeling and Simulation</b> (Graduate)	2013 – 2015
Recitation instructor, teaching and lab assistant	Linköping University
<b>Engineering Project</b> (Undergraduate)	2013
Project supervisor	Linköping University
<b>Automatic Control</b> (Undergraduate)	2012 – 2014
Recitation instructor, teaching and lab assistant	Linköping University
<b>Foundation Course in Mathematics</b> (Undergraduate)	2011
Recitation instructor and teaching assistant	Linköping University

## PROFESSIONAL SERVICE

### ORGANISATION

<b>Symposium on Advances in Approximate Bayesian Inference</b>	2023 – 2024
Co-organizer, Program Chair	AABI
<b>International Conference on Artificial Intelligence and Statistics</b>	2023
Workflow Chair	AISTATS

## SENIOR PROGRAM COMMITTEE

<b>Conference on Uncertainty in Artificial Intelligence</b>	2024
Area Chair	UAI
<b>International Conference on Artificial Intelligence and Statistics</b>	2024
Senior Area Chair	AISTATS
<b>International Conference on Artificial Intelligence and Statistics</b>	2022
Area Chair	AISTATS

## REVIEWING

<b>Journal of Machine Learning Research (JMLR)</b>	2020 – 2021
<b>Neural Information Processing Systems (NeurIPS)</b>	2017 – 2020
<b>International Conference on Machine Learning (ICML)</b>	2017 – 2018
<b>International Conference on Learning Representations (ICLR)</b>	2017
<b>International Conference on Artificial Intelligence and Statistics (AISTATS)</b>	2017 – 2018

## DOCTORAL COMMITTEES

<b>Gabriel Bénédict</b>	2024
A Machine Learning Personalization Flow	University of Amsterdam
<b>Salem Lahlou</b>	2023
Advances in uncertainty modelling: from epistemic uncertainty estimation to generalized generative flow networks	Université de Montréal, MILA