

# Christian A. Naesseth

Informatics Institute, University of Amsterdam – Netherlands

✉ christian.a.naesseth@uva.nl • 🌐 naesseth.github.io

## Academic Positions

---

<b>Assistant Professor</b> <i>Amsterdam Machine Learning Lab</i> <i>Research Interests:</i> Approximate statistical inference, causality and artificial intelligence as well as their application to the sciences	<b>University of Amsterdam</b> 2022 Jan–
<b>Postdoctoral Research Scientist</b> <i>Data Science Institute</i> <i>Mentor:</i> Prof. David Blei <i>Topic:</i> Approximate Bayesian inference, causal inference and machine learning	<b>Columbia University</b> 2019 Aug–2021 Dec
<b>Postdoctoral Researcher</b> <i>Department of Computer and Information Science</i> <i>Mentor:</i> Dr. Fredrik Lindsten <i>Topic:</i> Computational statistics, Monte Carlo methods, and variational methods	<b>Linköping University</b> 2019 Jan–Jul
<b>Research Intern</b> <i>Machine Intelligence &amp; Perception</i> <i>Host:</i> Dr. Sebastian Nowozin <i>Topic:</i> Projekt Tokyo - Visual agent technology to help people who are blind or low vision	<b>Microsoft Research Ltd</b> 2018 Apr–Jul
<b>Fulbright Visiting Student Researcher</b> <i>Data Science Institute</i> <i>Host:</i> Prof. David Blei <i>Topic:</i> Variational and Monte Carlo methods	<b>Columbia University</b> 2016 Jul–2017 Jun
<b>Visiting PhD Student</b> <i>Department of Engineering Science</i> <i>Host:</i> Dr. Frank Wood <i>Topic:</i> Probabilistic programming and computational statistics	<b>University of Oxford</b> 2015 Oct
<b>Teaching Assistant</b> <i>Department of Electrical Engineering, Department of Mathematics</i>	<b>Linköping University</b> 2011 Aug–2018 Dec

## Academic Degrees and Education

---

<b>Ph.D., Electrical Engineering</b> Thesis: Machine learning using approximate inference: Variational and SMC methods Advisors: Dr. Fredrik Lindsten, Prof. Thomas Schön	<b>Linköping University</b> 2019 Jan
<b>M.Sc., Applied Physics and Electrical Engineering</b> Thesis: Vision and Radar Sensor Fusion for Advanced Driver Assistance Systems	<b>Linköping University</b> 2013 Jun
<b>B.Sc., Mathematics</b> Thesis: Nowcasting using Microblog Data	<b>Linköping University</b> 2012 Aug
<b>Exchange Program, Electrical Engineering</b>	<b>Beijing Institute of Technology</b> 2010 Aug–2011 Jun
<b>Chinese Language Studies</b>	<b>Shanghai Jiaotong University</b> 2008 Aug–2010 Jan

## Honors, Awards and Grants

---

<b>Savage Award</b> <i>International Society for Bayesian Analysis (ISBA)</i> Awarded for 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> <i>Neural Information Processing Systems (NeurIPS)</i>	2017

### Best Paper Award

20th International Conference on Artificial Intelligence and Statistics (AISTATS) 2017  
Awarded for the paper *Reparameterization Gradients through Acceptance–Rejection Algorithms*.

### Fulbright Scholarship

Fulbright Commission 2016  
Fulbright scholarship to study and do research in USA, awarded based on academic excellence and leadership potential.

### Research Scholarships

Ericsson Research Foundation, Gålostiftelsen, Bernt Järmarks stiftelse 2016  
Research grants (3) to support research visit to Columbia University, USA. Awarded based on academic and research excellence.

### Best Poster Award

Summer School on Deep Learning for Image Analysis 2014  
Awarded for poster on *Sequential Monte Carlo for Graphical Models*.

### Academic Scholarships

Adolf Lindgrens Stiftelse, Kamratshjälpfonden, Teknikföretagens, Anna Whitlocks Minnesfond 2008/2010  
Scholarships (6) to study in Asia, selection process based on academic performance.

## Publications

---

- T. Pandeve, T. Bakker, C. A. Naesseth, and P. Forré. E-evaluating classifier two-sample tests. *arXiv:2210.13027*, 2022.
- H. Zimmermann, F. Lindsten, JW van de Meent, and C. A. Naesseth. A variational perspective on generative flow networks. *arXiv:2210.07992*, 2022.
- L. Zhang, D. Blei, and C. A. Naesseth. Transport score climbing: Variational inference using forward KL and adaptive neural transport. *arXiv:2202.01841*, 2022.
- 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>Monte Carlo and Variational Methods: Bridging the Gap</b>	<b>CMStatistics</b>
<i>Special Invited Session: Grand challenges and advances in Bayesian computation</i>	2022 Dec
<b>Monte Carlo and Variational Methods: Bridging the Gap</b>	<b>ESSEC Paris</b>
<i>Workshop on Monte Carlo and Approximate Dynamic Programming Methods</i>	2022 Aug
<b>Variational Bayes Goes to Monte Carlo</b>	<b>University of Amsterdam</b>
<i>Amsterdam Machine Learning lab (seminar)</i>	2021 May
<b>Machine learning using approximate inference</b>	<b>Joint Statistical Meeting</b>
<i>Savage Award session (contributed talk)</i>	2020 Aug
<b>Machine learning using approximate inference</b>	<b>Bocconi University</b>
<i>Junior Bayes Beyond the Borders (webinar)</i>	2020 Jul
<b>Variational and Monte Carlo methods</b>	<b>KTH</b>
<i>Center for Industrial and Applied Mathematics (seminar)</i>	2019 Feb
<b>Variational and Monte Carlo methods</b>	<b>Chalmers</b>
<i>Department of Mathematical Sciences (seminar)</i>	2019 Jan
<b>Variational inference</b>	<b>Uppsala University</b>
<i>Department of Information Technology (tutorial)</i>	2018 Feb

<b>Approximate Bayesian inference: Variational and MC methods</b> <i>Department of Computer Science (seminar)</i>	<b>Linköping University</b> 2017 Nov
<b>Monte Carlo methods and proper weighting</b> <i>Department of Engineering Science (tutorial)</i>	<b>The University of Oxford</b> 2015 Oct
<b>Nested Sequential Monte Carlo Methods</b> <i>SMC Workshop</i>	<b>ENSAE Paris</b> 2015 Aug
<b>Sequential Monte Carlo for Probabilistic Graphical Models</b> <i>School of Mathematics and Statistics (seminar)</i>	<b>University of NSW</b> 2014 Oct
<b>Sequential Monte Carlo for Probabilistic Graphical Models</b> <i>School of Electrical Engineering and Computer Science (seminar)</i>	<b>University of Newcastle</b> 2014 Oct

## Professional Service

---

<b>Co-Organizer, Symposium on Advances in Approximate Bayesian Inference</b> 2023	AABI
<b>Workflow Chair, International Conference on Artificial Intelligence and Statistics</b> 2023	AISTATS
<b>Area Chair, International Conference on Artificial Intelligence and Statistics</b> 2022	AISTATS
<b>Reviewer, Journal of Machine Learning Research</b> 2020	JMLR
<b>Reviewer, Neural Information Processing Systems</b> 2017, 2018, 2019, 2020	NeurIPS
<b>Reviewer, International Conference on Machine Learning</b> 2017, 2018	ICML
<b>Reviewer, International Conference on Learning Representations</b> 2017	ICLR
<b>Reviewer, International Conference on Artificial Intelligence and Statistics</b> 2017, 2018	AISTATS

## Teaching Experience

---

Experience as a lecturer, recitation instructor, teaching and lab assistant in basic and advanced courses on machine learning, automatic control, mathematical modeling, simulation, mathematics and signal processing. Completed a first course (6 ECTS) on learning and knowledge in higher education.

<b>Introduction to Machine Learning</b> <i>Lecturer</i> B.Sc. level, 1 occasion	2022
<b>Foundations of Graphical Models</b> <i>Guest lecturer</i> Ph.D. level, 1 occasion	2019
<b>Sensor Fusion</b> <i>Recitation instructor, teaching and lab assistant</i> M.Sc. level, 2 occasions	2015–2016
<b>Digital Signal Processing</b> <i>Lab assistant</i> M.Sc. level, 1 occasion	2014
<b>Industrial Control Systems</b> <i>Recitation instructor, teaching and lab assistant</i> M.Sc. level, 1 occasion	2014
<b>Control Project Laboratory</b> <i>Project supervisor</i> M.Sc. level, 4 occasions	2014–2018

**Modeling and Simulation***Recitation instructor, teaching and lab assistant**2013–2015*

M.Sc. level, 3 occasions

**Engineering Project***Project supervisor**2013*

B.Sc. level, 1 occasion

**Automatic Control***Recitation instructor, teaching and lab assistant**2012–2014*

B.Sc. level, 5 occasions

**Foundation Course in Mathematics***Recitation instructor and teaching assistant**2011*

B.Sc. level, 1 occasion

**Languages**

---

**Swedish:** Native Proficiency**English:** Full Professional Working Proficiency**Chinese:** Limited Working Proficiency