Christian A. Naesseth

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Academic Positions

Postdoctoral Research Scientist — **Columbia University**
Data Science Institute — *2019 Aug–*
Mentor: Prof. David Blei

Postdoctoral Researcher — **Linköping University**
Department of Computer and Information Science — *2019 Jan–Jul*
Mentor: Dr. Fredrik Lindsten

Research Intern — **Microsoft Research Ltd**
Machine Intelligence & Perception — *2018 Apr–Jul*
Host: Dr. Sebastian Nowozin

Fulbright Visiting Student Researcher — **Columbia University**
Data Science Institute — *2016–2017*
Host: Prof. David Blei

Visiting PhD Student — **University of Oxford**
Department of Engineering Science — *2015 Oct*
Host: Dr. Frank Wood

Teaching Assistant — **Linköping University**
Department of Electrical Engineering, Department of Mathematics — *2011–2018*

Academic Degrees and Education

Ph.D., Electrical Engineering — **Linköping University**
Thesis: Machine learning using approximate inference: Variational and SMC methods — *2018*
Advisors: Dr. Fredrik Lindsten, Prof. Thomas Schön

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

B.Sc., Mathematics — **Linköping University**
Thesis: Nowcasting using Microblog Data — *2012*

Exchange Program, Electrical Engineering — **Beijing Institute of Technology**
2010-2011

Chinese Language Studies — **Shanghai Jiaotong University**
2008-2010

Publications

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.

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. Publisher: 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, 2014.

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 2014.

Honors and Awards

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

Best Reviewer Award
Neural Information Processing Systems (NeurIPS) *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, Gålöstiftelsen, 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, Kamratshjälpsfonden, Teknikföretagens, Anna Whitlocks Minnesfond *2008/2010*
Scholarships (6) to study in Asia, selection process based on academic performance.

Invited Talks

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

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

Variational and Monte Carlo methods – Bridging the Gap **KTH**
Center for Industrial and Applied Mathematics (seminar) *2019 Feb*

Variational and Monte Carlo methods – Bridging the Gap **Chalmers**
Department of Mathematical Sciences (seminar) *2019 Jan*

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

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

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

Nested Sequential Monte Carlo Methods **SMC Workshop**
(contributed talk) *2015 Aug*

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

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

Professional Service

Reviewer, Journal of Machine Learning Research
2020 *JMLR*

Reviewer, Neural Information Processing Systems
2017, 2018, 2019, 2020 *NeurIPS*

Reviewer, International Conference on Machine Learning
2017, 2018 *ICML*

Reviewer, International Conference on Learning Representations
2017 *ICLR*

Reviewer, International Conference on Artificial Intelligence and Statistics
2017, 2018 *AISTATS*

Teaching Experience

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

4th year, 2 occasions
Teaching and lab assistant in Sensor Fusion *2015–2016*

4th year, 1 occasion
Lab assistant in Digital Signal Processing *2014*

4th year, 1 occasion
Teaching and lab assistant in Industrial Control Systems *2014*

5th year, 4 occasions
Project supervisor in Control Project Laboratory *2014–2018*

4th year, 3 occasions
Teaching and lab assistant in Modeling and Simulation *2013–2015*

1st year, 1 occasion
Project supervisor in Engineering Project *2013*

3rd year, 5 occasions
Teaching and lab assistant in Automatic Control *2012–2014*

1st year, 1 occasion
Teaching assistant in Foundation Course in Mathematics *2011*

Languages

Swedish: Native Proficiency

English: Full Professional Proficiency

Chinese: Professional Working Proficiency

References

Available upon request.