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	*2012–2018*
Teaching Assistant	**Linköping University**
Department of Mathematics	*2011*

Academic Degrees and Education

Ph.D., Electrical Engineering	**Linköping University**
Machine learning using approximate inference: Variational and SMC methods	*2018*
Advisors: Dr. Fredrik Lindsten, Prof. Thomas Schön	
M.Sc., Applied Physics and Electrical Engineering – International	**Linköping University**
Vision and Radar Sensor Fusion for Advanced Driver Assistance Systems	*2013*
B.Sc., Mathematics	**Linköping University**
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
Outstanding dissertation in Theory and Methods   *2019*
Awarded for the thesis *Machine learning using approximate inference: Variational and SMC methods*.

Best Paper Award
20th International Conference on Artificial Intelligence and Statistics   *2017*
Awarded for the paper *Reparameterization Gradients through Acceptance–Rejection Algorithms*.

Fulbright Scholarship
Fulbright Commission   *2016/2017*
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 2010
Scholarships (4) to study in Asia, selection process based on academic performance.

Academic Scholarships

Adolf Lindgrens Stiftelse, Kamratshjälpsfonden, Teknikföretagens Asienstipendium 2008
Scholarships (2) to study in Asia, selection process based on academic performance.

Academic Scholarship

Rudbecksskolan 2005
Scholarship awarded for excellent academic performance in high school.

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, 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.