Dong Liu, Ph.D.

Personal data

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Work Experience

Present 2020 Nov	Researcher on Bayesian models and methods, Department of Intelligent Systems KTH Royal Institute of Technology, Stockholm, Sweden.
2020 Jan 2018 Jan	Algorithm consultant of start-up, SIAJOR Co. Ltd A solution provider of artificial intelligent systems.
2016 Dec 2016 Apr	Research engineer, standardization of radio access technology Shanghai Research Institute, Huawei Technologies Co., Ltd

Education

2020 Nov 2016 Dec	Ph.D. (temporary employee) Research in statistical models, Bayesian inference, machine learning Dissertation: **Perspectives on Probabilistic Graphical Models**, KTH DIVA Information Science and Engineering, Department of Intelligent Systems School of Electrical Engineering and Computer Science KTH Royal Institute of Technology, Stockholm, Sweden.
2016 Mar 2013 Sep	M.Sc. **Top 5%, Excellent Graduate of Shanghai City in 2016.** School of Electrical and Information Engineering Tongji Univsersity, Shanghai, China.
2013 Jul 2009 Sep	B.E. **Top 1%, Excellent Graduate of Liaoning Province in 2013** Shenyang University of Technology, Shenyang, China

Summer School

2012 Sep	Chinese Academy of Sciences, China. Scholarship provided by the Chinese Academy of Sciences.
2012 Aug	Kochi University of Technology, Kochi, Japan. Scholarship provided Kochi University of Technology.

Practical skills (*GitHub Profile*)

Technical skills:	I am a superuser. Experience in the administration of Linux computational servers (2017-2020).
Programming:	Python, Pytorch, Bash, C++ Matlab, LaTeX

Research

Interests	Probabilistic graphical model design General Bayesian inference and learning algorithm design Time series model and algorithm design Stochastic geometric, complex network Application of above-mentioned models and algorithms

Recent Projects

2020 2019	Neural network based probabilistic graphical model design and application Likelihood-tractable probabilistic graphical model design integrating modern neural models, inference and learning algorithm design of proposed models. Computational platform: Swedish National Infrastructure for Computing (SNIC 2019/3-232) Application and demonstration: Speech Recognition, Infant Sepsis Detection with Karolinska Institute, MLE Classifiers
2019 2018	Advanced message passing design Joint project by KTH Royal Institute of Technology and Huawei Research Low-complexity approximate belief propagation/message passing design and implementation, neural network based inference solution deign and benchmarks, application in MIMO detection. 1 million+ funding. Two master students graduated from this projects (Scotti, Torres), supervised student paper received *ICML Workshop GRL+ noval application*; partial open-source code github repository
	see research&development for other recent research and developments

Recent Publications (or see more at my Scholar)

[1] **D. Liu**, R. Thobaben, and L. K. Rasmussen, "Region-based energy neural network for approximate inference," *arXiv preprint arXiv:2006.09927*, 2020.

[2] **D. Liu**, M. T. Vu, Z. Li, and L. K. Rasmussen, "α belief propagation for approximate inference," *arXiv preprint arXiv:2006.15363*, 2020.

[3] Z. Li, G. Dan, and **D. Liu**, "A game theoretic analysis of lqg control under adversarial attack," in *59th IEEE Conference on Decision and Control*, 2020.

[4] A. Ghosh, A. Honoré, **D. Liu**, G. E. Henter, and S. Chatterjee, "Robust classification using hidden markov models and mixtures of normalizing flows," in *IEEE International Workshop on Machine Learning for Signal Processing*, 2020.

[5] A. Scotti, N. N. Moghadam, **D. Liu**, K. Gafvert, and J. Huang, "Graph neural networks for massive mimo detection and higher-order qam," in *ICML Workshop on Graph Representation Learning and Beyond*, 2020.

[6] **D. Liu**, A. Honoré, S. Chatterjee, and L. K. Rasmussen, "Powering hidden markov model by neural network based generative models," in *The 24th European Conference on Artificial Intelligence (ECAI)*, 2020.

[7] A. Honoré, **D. Liu**, D. Forsberg, K. Coste, E. Herlenius, S. Chatterjee, and M. Skoglund, "Hidden markov models for sepsis detection in preterm infants," in *ICASSP 2020-2020 IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP)*. IEEE, 2020, pp. 1130–1134.

[8] **D. Liu**, M. T. Vu, S. Chatterjee, and L. K. Rasmussen, "Neural network based explicit mixture models and expectation-maximization based learning," in *International Joint Conference on Neural Networks*, 2020.

[9] S. Chatterjee, A. M. Javid, M. Sadeghi, S. Kikuta, **D. Liu**, P. P. Mitra, and M. Skoglund, "Ssfn–self size-estimating feed-forward network with low complexity, limited need for human intervention, and consistent behaviour across trials," *arXiv preprint arXiv:1905.07111*, 2019.

[10] **D. Liu**, C. Wang, and L. K. Rasmussen, "Discontinuous reception for multiple-beam communication," *IEEE Access*, vol. 7, pp. 46 931–46 946, 2019.

[11] **D. Liu**, M. T. Vu, S. Chatterjee, and L. K. Rasmussen, "Entropy-regularized optimal transport generative models," in *ICASSP 2019-2019 IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP)*. IEEE, 2019, pp. 3532–3536.

[12] **D. Liu**, N. N. Moghadam, L. K. Rasmussen, J. Huang, and S. Chatterjee, "α belief propagation as fully factorized approximation," in *IEEE Global Conference on Signal and Information Processing*, 2019.

[13] **D. Liu**, B. Cavarec, L. K. Rasmussen, and J. Yue, "On dominant interference in random networks and communication reliability," in *ICC 2019-2019 IEEE International Conference on Communications (ICC)*. IEEE, 2019, pp. 1–7.

[14] **D. Liu**, V. Fodor, and L. K. Rasmussen, "Will scale-free popularity develop scale-free geo-social networks?" *IEEE Transactions on Network Science and Engineering*, 2018.

Patent

X. Hu, **D. Liu**, T. Deng, Wireless communication method and apparatus, authorized regions: China (CN108377536A), USA (US20190261448A1), European (EP3528553A1), Brazil (BR112019008777A2).

Grants & Scholarships

2019 Nov	Grants, amount $\approx 83k$ SEK.
2017 Jan	Grant from Karl Engvers Foundation, Sweden, 2020.
	Grant from Knut and Alice Wallenberg Foundation "Jubilee appropriation", Sweden, 2019.
	Grant from Ericsson Research Foundation, Sweden, 2019.
	Grant from General Travel Foundation, KTH, Sweden, 2019.
	Gran from IEEE Signal Processing Society Travel Grant, 2019.
2016 Dec	Postgraduate studies scholarships, amount $\approx 55k$ SEK.
2013 Aug	National Scholarship for Postgraduate Studies, China, 2013-2016.
	National Scholarship for Postgraduate, China, 2015.
2013 Jun	Undergraduate studies scholarships, amount $\approx 49k$ SEK.
2009 Sep	National Scholarship for Undergraduates in 2012 and 2011, respectively.
	The First Class Scholarship of Chinese Instrument and Control Society in 2012.
	The Mayor Scholarship of Shenyang City in 2011.
	The Scholarship of Liaoning Provincial Government in 2010.
	The Special Scholarship in 2012, 2011 and the First-class scholarship in 2010, from Shenyang University of Technology.

Teaching

	Courses
2020 Fall	Teaching Assistant Industry course (Ericsson), EP232U Deep Neural Networks, KTH Royal Institute of Technology, Sweden.
2020 Sep 2017 Sep	Teaching Assistant Graduate course EQ2341 Pattern Recognition and Machine Learning (regularly offer once per year), KTH Royal Institute of Technology, Sweden.

	Supervision of Master Students
2021	Julius Olson, Using machine learning to improve volume estimation and yield prediction in the Swedish forestry industry, joint project with Digital Edge, Sweden
2018	Ruichao Qian, Deep-learning-based pose estimation of 3D object, joint project Gleechi AB, Sweden
	Tianyi Li, Exploration of feature extraction algorithm on deepfake detection for videos, joint project with Guizhou YongHong Aviation Machinery, China
	Andrea Pozzoli, Machine learning algorithms for 5G, joint project with Huawei research, Sweden
	Matteo Ferrini, Machine learning algorithms for 5G, joint project with Huawei research, Sweden
	A. Scotti (topic: graph neural network & approximate message passing), currently artificial intelligence engineer in NNAISENSE, Switzerland

Master thesis: Graph Neural Networks and Learned Approximate Message Passing Algorithms for Massive MIMO Detection, joint project with Huawei research, Sweden
A. Ghosh (topic: neural network & hidden Markov model), currently Ph.D. candidate in KTH, Sweden Master thesis: Normalizing Flow based Hidden Markov Models for Phone Recognition
J. Torres (topic: approximate inference & message passing), currently researcher in Institute for Systems and Robotics, Spain Master thesis: Approximate Inference Low-Complexity MIMO Detection, joint project with Huawei research, Sweden
F. Goncalves Contente Master thesis: Hierarchical Clustering based Dynamic Subarrays for Hybrid Beamforming Massive MU-MIMO, joint project with Huawei research, Sweden

Languages

Mother tongue : Chinese
Professional : English

Contest Awards

2019	The Bronze Award in the 5th China Internet+ University Graduates Innovation & Entrepreneurship Awards.
2014	The First Prize in the National Postgraduate Mathematic Contest in Modeling in China (Top **2.45**% **in 4900** teams in China.)
2012	The President Award in Fukuda Gold Robot Cup Contest of Shenyang City.
2011	The Grand Prize in Liaoning Contest District of National Undergraduate Electronic Design Contest.
2011	The First Prize in Liaoning Contest District of Chinese Undergraduate Mathematical Contest in 2011 and 2010 respectively.

Honors

2016 Jun	The Excellent Graduate of Shanghai City in 2016.
to	The Excellent Graduate of Liaoning Province in 2013.
2011 Sep	The Excellent Graduate of Shenyang University of Technology in 2013.
	The Award Nomination in People of Year 2012 of Liaoning Provincial Undergraduates.
	The Pivot of Merit Students of Liaoning Province in 2012.
	The Outstanding Inspirational Talent of College Students of Liaoning Province in 2011.
	The Youth Medal of Shenyang University of Technology in 2012 (4 award winners are selected among over 16,000 undergraduates every two years).
	The Second Prize for Outstanding Contribution to the university in 2011, the Excellent Student Leader in 2011, the Pivot of Merit Students in 2010, the Top Ten Students of school in 2012, 2011 and 2010, respectively, Shenyang University of Technology.

References

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