Liming Wang

Curriculum vitae

HERE Technologies
425 W Randolph St.
Chicago, IL 60606, USA

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Employment

Lead Data Scientist **March, 2020 - Present**
HERE Technologies
Chicago, Illinois, USA
Responsibility: Taking lead role on designing large-scale AI/ML algorithms for various sources, including trajectory and imagery data, aimed to enhance map features and cater specific customer requests.

Senior Data Scientist **Oct, 2017 - March, 2020**
HERE Technologies
Chicago, Illinois, USA

Postdoctoral Researcher **Oct, 2015 - Oct, 2017**
Department of Electrical and Computer Engineering
The Ohio State University, Columbus, Ohio, USA
- Advisor: Prof. Yuejie Chi

Postdoctoral Associate **May, 2012 - Oct, 2015**
Department of Electrical and Computer Engineering
Duke University, Durham, North Carolina, USA
- Advisor: Prof. Lawrence Carin & Prof. Robert Calderbank

Visiting Scholar **September, 2014**
Department of Electronic and Electrical Engineering
University College London, London, UK
- Advisor: Prof. Miguel Rodrigues

Postdoctoral Research Scientist **January, 2011 - April, 2012**
Department of Electrical Engineering
Columbia University, New York, New York, USA
- Advisor: Prof. Xiaodong Wang

Research Assistant **January, 2008 - December, 2010**
Multimedia Communications Laboratory
Department of Electrical and Computer Engineering
University of Illinois at Chicago, Chicago, Illinois, USA

Research Interests

Machine Learning, High-dimensional Signal Processing, Deep Learning, Statistical Signal Processing and Modeling, Compressive Sensing, Information Theory, Bioinformatics, Genomic and Proteomic Signal Processing, Computational Biology.

Education

University of Illinois at Chicago, Chicago, Illinois, USA
Department of Electrical and Computer Engineering

Ph.D., Electrical Engineering, 2011
- Advisor: Prof. Dan Schonfeld

University of Illinois at Chicago, Chicago, Illinois, USA
Department of Mathematics, Statistics, and Computer Science

M.S., Mathematics: Pure Math, 2011
- Advisor: Prof. Stefan Wenger

Huazhong University of Science and Technology, Wuhan, Hubei, China
Department of Electronics and Information Engineering

B.S., Electrical Engineering, 2006
- Advisor: Prof. Hanqiang Cao

Teaching Experience

Lecturer **Fall Semester, 2016**
Department of Biomedical Informatics
The Ohio State University, Columbus, Ohio, USA

- BMI 5710 Introduction to Biomedical Informatics

Teaching Assistant **September, 2006 - December, 2010**
Department of Electrical and Computer Engineering
University of Illinois at Chicago, Chicago, Illinois, USA
Responsible for grading homework, instructing lab sessions, designing and supervising student projects, holding office hour, problem sessions and occasional lectures.

- ECE 267 Computer Organizations I, Fall 2006, Spring 2007, Fall 2008, Spring 2009
- ECE 340 Electronics I, Fall 2007; Spring 2008
- ECE 341 Probability and Random Processes, Fall 2007
- ECE 367 Microprocessor-Based Design, Spring 2010
- ECE 431 Analog Communication Circuits, Fall 2009; Fall 2010

Honors and Awards

Student Presenter Award
Graduate College, University of Illinois at Chicago, 2009; 2010; 2011

GSC Travel Award
Graduate Student Council, University of Illinois at Chicago, 2009; 2010

Best Bachelor Degree Thesis Award of Hubei Province
Provincial Department of Education, Hubei, China, 2006

University Best Thesis Award
Huazhong University of Science and Technology, 2006

Outstanding Student Fellowship
Huazhong University of Science and Technology, 2002 - 2006

Publications and Patents

Journal Paper:

Liming Wang and Yuejie Chi, "Stochastic approximation and memory-limited subspace tracking for Poisson streaming data," *IEEE Transactions on Signal Processing*, vol. 66, no. 4, pp. 1051-1064, February 2018.

Liming Wang, Minhua Chen, Miguel Rodrigues, David Wilcox, Robert Calderbank and Lawrence Carin, "Information-theoretic compressive measurement design," *IEEE Transactions on Pattern Analysis and Machine Intelligence*, vol. 39, no. 6, pp. 1150-1164, June 2017.

Francesco Renna, Liming Wang, Xin Yuan, Jianbo Yang, Galen Reeves, Robert Calderbank, Lawrence Carin and Miguel Rodrigues, "Classification and reconstruction of high-dimensional signals from low-dimensional noisy features in the presence of side information," *IEEE Transactions on Information*

Theory, vol. 62, no. 11, pp. 6459-6492, Nov 2016.

Liming Wang and Yuejie Chi, "Blind deconvolution from multiple sparse inputs," *IEEE Signal Processing Letters*, vol. 23, no. 10, pp. 1384-1388, October 2016.

Liming Wang, Jiaji Huang, Xin Yuan, Kalyani Krishnamurthy, Joel Greenberg, Volkan Cevher, Miguel Rodrigues, David Brady, Robert Calderbank and Lawrence Carin, "Signal recovery and system calibration from multiple compressive Poisson measurements," *SIAM Journal on Imaging Sciences*, vol. 8, no. 3, pp. 1923-1954, 2015.

Liming Wang, David Carlson, Miguel Rodrigues, Robert Calderbank and Lawrence Carin, "A Bregman matrix and the gradient of mutual information for vector Poisson and Gaussian channels," *IEEE Transactions on Information Theory*, vol. 60, no. 5, pp. 2611-2629, May 2014.

Hao Wu, Liming Wang, Xiaodong Wang and Xiaohu You, "Asymptotic and non-asymptotic analysis of uplink sum rate for relay-assisted MIMO cellular systems," *IEEE Transactions on Signal Processing*, vol. 62, no. 6, pp. 1348-1360, March 2014.

Liming Wang and Xiaodong Wang, "Hierarchical Dirichlet process model for gene expression clustering," *EURASIP Journal on Bioinformatics and Systems Biology* 2013, 2013:5.

Liming Wang, Xiaodong Wang, Adam Arkin and Michael Samoilov, "Inference of gene regulatory networks from genome-wide knockout fitness data," *Bioinformatics*, 29(3), pp. 338-346, February 2013.

Liming Wang and Dan Schonfeld, "Mapping equivalence for symbolic sequences: theory and applications," *IEEE Transactions on Signal Processing*, vol. 57, no. 12, pp. 4895-4905, December 2009.

Conference Paper:

Liming Wang and Yuejie Chi, "Memory-limited stochastic approximation for Poisson subspace tracking," *IEEE International Workshop on Computational Advances in Multi-Sensor Adaptive Processing (CAMSAP 2017)*, Curaçao, Dutch Antilles, December, 2017.

Liming Wang, Francesco Renna, Xin Yuan, Miguel Rodrigues, Robert Calderbank and Lawrence Carin, "A general framework for reconstruction and classification from compressive measurements with side information," *IEEE International Conference on Acoustics, Speech, and Signal Processing (ICASSP 2016)*, Shanghai, China, March, 2016.

Liming Wang, Jiaji Huang, Xin Yuan, Volkan Cevher, Miguel Rodrigues, Robert Calderbank and Lawrence Carin, "A concentration-of-measure inequality for multiple-measurement models," *IEEE International Symposium on Information Theory (ISIT 2015)*, Hong Kong, June, 2015.

Francesco Renna, Liming Wang, Xin Yuan, Jianbo Yang, Galen Reeves, Robert Calderbank, Lawrence Carin and Miguel Rodrigues, "Classification and reconstruction of compressed GMM signals with side information," *IEEE International Symposium on Information Theory (ISIT 2015)*, Hong Kong, June, 2015.

Miguel Rodrigues, Liming Wang, Robert Calderbank and Lawrence Carin, "'Most-informative' compressive measurement design for classification and reconstruction of imagery data," *NATO SET-213 Specialist Meeting: Compressive Sensing for Radar/SAR and EO/IR Imaging*, Tallinn, Estonia, May, 2014.

Liming Wang, Abolfazl Razi, Miguel Rodrigues, Robert Calderbank and Lawrence Carin, "Nonlinear information-theoretic compressive measurement design," ***International Conference on Machine Learning (ICML 2014)***, Beijing, China, June, 2014.

Liming Wang, David Carlson, Miguel Rodrigues, David Wilcox, Robert Calderbank and Lawrence Carin, "Designed measurements for vector count data," ***Neural Information Processing Systems (NIPS 2013)***, Lake Tahoe, NV, December, 2013.

Liming Wang, Miguel Rodrigues and Lawrence Carin, "Generalized Bregman divergence and gradient of mutual information in vector Poisson channels," *IEEE International Symposium on Information Theory (ISIT 2013)*, Istanbul, Turkey, July, 2013.

Jing Huang, Liming Wang and Dan Schonfeld, "Compressed sensing: a novel polynomial complexity solution to Nash equilibria in dynamical games," *IEEE International Conference on Acoustics, Speech, and Signal Processing (ICASSP 2013)*, Vancouver, Canada, May, 2013.

Liming Wang and Dan Schonfeld, "Mapping equivalence under iterative dynamics for symbolic sequences," *IEEE Statistical Signal Processing Workshop (SSP 2012)*, Ann Arbor, MI, August, 2012.

Liming Wang, Nicola Piotto and Dan Schonfeld, "Boosting quantization for L^p norm distortion measure," *IEEE Statistical Signal Processing Workshop (SSP 2012)*, Ann Arbor, MI, August, 2012.

Liming Wang and Xiaodong Wang, "Gene deletion data based genomic regulatory network inference," *IEEE Statistical Signal Processing Workshop (SSP 2012)*, Ann Arbor, MI, August, 2012.

Liming Wang and Xiaodong Wang, "A non-parametric Bayesian clustering for gene expression data," *IEEE Statistical Signal Processing Workshop (SSP 2012)*, Ann Arbor, MI, August, 2012 (Invited).

Liming Wang and Dan Schonfeld, "Stability of an iterative dynamical system," *American Control Conference (ACC 2012)*, Montréal, Canada, June, 2012.

Liming Wang, Vikram Krishnamurthy and Dan Schonfeld, "Factor graph-based structural equilibria in dynamical games," *IEEE International Conference on Acoustics, Speech, and Signal Processing (ICASSP 2011)*, Prague, Czech, May, 2011.

Liming Wang and Dan Schonfeld, "Dynamics, stability and consistency in representation of genomic sequences," *IEEE International Workshop on Genomic Signal Processing and Statistics (GENSIPS 2010)*, Cold Spring Harbor, NY, November, 2010.

Liming Wang and Dan Schonfeld, "Game theoretical model for control of gene regulatory networks," *IEEE International Conference on Acoustics, Speech, and Signal Processing (ICASSP 2010)*, Dallas, TX, March, 2010.

Liming Wang and Dan Schonfeld, "Consistency in representation and transformation of genomic sequences," *IEEE International Workshop on Genomic Signal Processing and Statistics (GENSIPS 2009)*, Minneapolis, MN, May, 2009.

Patent:

Liming Wang and Qin Chen, "Curvature value detection and evaluation," US Patent pending, 2021.

Henry Dørum and Liming Wang, "Method for deriving turning maneuver curvature using principal curves," US Patent pending, 2020.

Qi Mao, Qin Chen and Liming Wang, "Map matcher with wrong map features," US & EU Patents pending, 2019.

Thesis:

Genomic Signal Processing and Regulatory Networks: Representation, Dynamics and Control, Ph.D. thesis, University of Illinois at Chicago, 2011

Isoperimetric Inequalities in Carnot Groups, Master thesis, University of Illinois at Chicago, 2011

Transform Domain Based Super-resolution Reconstruction Algorithm from Compressed Video Sequence, Bachelor thesis, Huazhong University of Science and Technology, 2006

Talks

- 06/2015 IEEE International Symposium on Information Theory, Hong Kong.
- 03/2015 Dept. of Electrical & Computer Engineering, Louisiana State University, LA.
- 03/2015 SIAM Conference on Computational Science and Engineering, Salt Lake City, UT.
- 03/2015 Dept. of Electrical & Computer Engineering, University of Texas at San Antonio, TX.
- 09/2014 UCL-Duke Workshop on Sensing and Analysis of High-Dimensional Data, London, UK.
- 06/2014 International Conference on Machine Learning, Beijing, China.
- 07/2013 Duke Workshop on Sensing and Analysis of High-Dimensional Data, Durham, NC.
- 07/2013 IEEE International Symposium on Information Theory, Istanbul, Turkey.
- 05/2013 IEEE International Conference on Acoustics, Speech, and Signal Processing, Vancouver, Canada.
- 06/2012 American Control Conference, Montréal, Canada.
- 05/2011 IEEE International Conference on Acoustics, Speech, and Signal Processing, Prague, Czech.

Professional Activities

Senior Member, IEEE

Reviewer:

Journal:

- BMC Genomics
- Computational Biology and Chemistry
- Digital Signal Processing
- EURASIP Journal on Advances in Signal Processing
- IEEE Access
- IEEE Computational Intelligence Magazine
- IEEE Journal of Selected Topics in Signal Processing
- IEEE/ACM Transactions on Computational Biology and Bioinformatics
- IEEE Transactions on Computational Imaging
- IEEE Transactions on Molecular, Biological, and Multi-Scale Communications
- IEEE Transactions on Information Theory
- IEEE Transactions on Signal Processing
- IEEE Wireless Communications Letters
- Journal of the Franklin Institute
- PLOS ONE
- SIAM Journal on Imaging Sciences
- Signal Processing: Image Communication

Conference:

- European Signal Processing Conference (EUSIPCO)
- IEEE Global Communications Conference (Globecom)

- IEEE Global Conference on Signal and Information Processing (GlobalSIP)
- IEEE International Conference on Acoustics, Speech, and Signal Processing (ICASSP)
- IEEE International Symposium on Information Theory (ISIT)
- IEEE International Workshop on Computational Advances in Multi-Sensor Adaptive Processing (CAMSAP)
- IEEE International Workshop on Machine Learning for Signal Processing (MLSP)
- IEEE International Workshop on Signal Processing Advances for Wireless Communications (SPAWC)
- IEEE Military Communications Conference (MILCOM)
- IEEE Statistical Signal Processing Workshop (SSP)
- IEEE Wireless Communications and Networking Conference (WCNC)
- International Conference on Machine Learning (ICML)
- Neural Information Processing Systems (NeurIPS)

Technical Program Committee:

- 2018 IEEE International Workshop on Machine Learning for Signal Processing (MLSP 2018)
- 2016 IEEE Global Conference on Signal and Information Processing (GlobalSIP 2016)
- 2015 IEEE Global Conference on Signal and Information Processing (GlobalSIP 2015)
- 2015 IEEE 82nd Vehicular Technology Conference (VTC 2015-Fall)

Technical Skills

- Database: Oracle, SQL Server, MangoDB, PostgreSQL
- Programming Languages: C/C++, Python
- Software Packages: MATLAB, Maple, Visual C++
- Operating Systems: Unix/Linux, Windows
- Cloud Platform: AWS