

Yue M. Lu

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Research Interests

Mathematical foundations and algorithmic aspects of high-dimensional statistical signal and information processing, computational harmonic analysis, imaging and image processing.

Research activities: (i) analyzing the dynamics and phase transitions of stochastic algorithms for estimation and learning via convex and nonconvex optimization; (ii) computational harmonic analysis (*applications*: multiscale geometric representations of large datasets, and nonlinear sampling theory); and (iii) statistical inference (*applications*: spatiotemporal photon-limited imaging and randomized methods for large-scale image processing.)

Career History

Gordon McKay Professor of Electrical Engineering and of Applied Mathematics (01/2019 – present)

John A. Paulson School of Engineering and Applied Sciences
Harvard University

Associate Professor of Electrical Engineering (01/2016 – 12/2018)

John A. Paulson School of Engineering and Applied Sciences
Harvard University

Assistant Professor of Electrical Engineering (11/2010 – 12/2015)

John A. Paulson School of Engineering and Applied Sciences
Harvard University

Postdoctoral Researcher (09/2007 – 10/2010)

School of Computer and Communication Sciences
École Polytechnique Fédérale de Lausanne (EPFL), Switzerland
Advisor: Martin Vetterli

Education

University of Illinois at Urbana-Champaign, Urbana, IL

Ph.D. in Electrical and Computer Engineering, 2007
Thesis title: Multidimensional Geometrical Signal Representation: Constructions and Applications
Advisor: Minh N. Do

M.S. in Mathematics, 2007

Thesis title: A Sampling Theory for Signals from a Union of Subspaces
Advisor: Richard S. Laugesen

Shanghai Jiao Tong University, Shanghai, China

B.E./M.E., 2002, both in Electrical Engineering
Extraordinary Student (ranked #1 in the class of over 3000 sophomores based on a university-wide competition on three common subjects—mathematics, physics, and English—held after the freshman year)

Selected Awards and Honors

Best Student Paper Award, First Prize (senior author)
The 7th IEEE CAMSAP Workshop, 2017

ECE Illinois Young Alumni Achievement Award
Department of ECE, University of Illinois at Urbana-Champaign, 2015

Best Student Paper Award (senior author)
IEEE Global Conference on Signal and Information Processing (GlobalSIP), Atlanta, 2014

Best Student Paper Award (senior coauthor)
IEEE International Conference on Acoustics, Speech and Signal Processing, Prague, 2011

Best Student Paper Award
IEEE International Conference on Image Processing, San Antonio, 2007

Most Innovative Paper Award
IEEE International Conference on Image Processing, Atlanta, 2006

Best Student Presentation Award
SIAM Southeastern-Atlantic Section Conference, Memphis, 2007

Sundaram Seshu International Student Fellowship
Department of ECE, University of Illinois at Urbana-Champaign, 2007

Frederic T. and Edith F. Mavis College of Engineering Fellowship
University of Illinois at Urbana-Champaign, 2006

Intel Graduate Research Mentor Award for Supervising Underrepresented Students in Engineering
College of Engineering, University of Illinois at Urbana-Champaign, 2006

Patents

- [1] US Patent 9,001,231, “Image acquisition using oversampled one-bit Poisson statistics”, Y. M. Lu, F. Yang and M. Vetterli, 04/07/2015.
- [2] US Patent 8,787,501, “Distributed sensing of signals linked by sparse filtering”, M. Vetterli, A. Hormati, O. Roy and Y. M. Lu, 07/22/2014.
- [3] US Patent 8,462,238, “Camera design for the simultaneous capture of near-infrared and visible images”, C. Fredembach, Y. M. Lu and S. E. Süssstrunk, 06/11/2013.
- [4] US Patent 8,451,921, “Method and an apparatus for adaptively learning a sparse impulse response of a continuous channel”, M. Vetterli, Y. M. Lu and M. McCormick, 05/28/2013.
- [5] US Patent 8,319,855, “Method, apparatus and system for image acquisition and conversion”, F. Yang, Y. M. Lu and M. Vetterli, 11/27/2012.
- [6] US Patent 8,170,642, “Method and system for lymph node detection using multiple MR sequences”, M. Yan, Y. Lu and M. Requardt, 05/01/2012.

Professional Activities and Services

Member of the Signal Processing Theory and Methods (SPTM) Technical Committee
IEEE Signal Processing Society (01/2016 – 12/2018, 01/2019 – 12/2021)

Member of the IEEE SP Society Big Data Special Interest Group (SIG)
IEEE Signal Processing Society (01/2019 – 12/2019)

Member of the IEEE Machine Learning for Signal Processing (MLSP) Technical Committee
IEEE Signal Processing Society (01/2019 – 12/2021)

Member of the Image, Video, and Multidimensional Signal Processing (IVMSP) Technical Committee
IEEE Signal Processing Society (01/2015 – 12/2017)

Associate Editor, IEEE Transactions on Signal Processing (09/2018 – 08/2020)

Associate Editor, IEEE Transactions on Image Processing (12/2014 – 05/2018)

Member of the Management Committee of the IEEE Transactions on Artificial Intelligence (01/2020 – 12/2021)

TPC Co-Chair: IEEE Statistical Signal Processing Workshop (2022)

Conference Co-Chair: SPIE Conference on Wavelets and Sparsity (2017, 2019)

Area Chair: IEEE International Conference on Image Processing (2013, 2015, 2016)

Local Arrangement Chair: IEEE International Conference on Computational Photography (2013)

IEEE SPS Liaison: 13th International Conference on Sampling Theory and Applications (2019)

Tutorial Instructor: IEEE International Conference on Acoustics, Speech and Signal Processing (2018)

Program Committee: IEEE Data Science Workshop (2019)

Program Committee: IEEE Global Conference on Signal and Information Processing (2018, 2019)

Program Committee: European Signal Processing Conference (2018)

Program Committee: IEEE Statistical Signal Processing Workshop (2016, 2018, 2020)

Program Committee: IEEE Image, Video and Multidimensional Signal Processing Workshop (2016, 2018)

Program Committee: IEEE International Conference on Acoustics, Speech and Signal Processing (2012 – 2020)

Program Committee: IEEE International Conference on Image Processing (2012 – 2019)

Program Committee: SPIE Wavelets and Sparsity (2013, 2015, 2017)

Program Committee: IEEE Global Conference on Signal and Information Processing (2013, 2014, 2015)

NSF Panel Members: CISE CCF review panels

Journal and Conference Reviews: IEEE Transactions on Information Theory, IEEE Transactions on Signal Processing, IEEE Transactions on Image Processing, IEEE Signal Processing Letters, IEEE Signal Processing Magazine, Applied and Computational Harmonic Analysis, Optics Express, COLT, ICML, Annals of Statistics

Member of Ph.D. viva jury at École Normale Supérieure, Paris: Marylou Gabrié (09/2019)

Professional Activities and Services (continued)

Member of Ph.D. thesis jury at EPFL:
Zafer Dogan (03/2015, as an external expert)
Zahra Sadeghipoor Kermani (08/2015, as a thesis co-director)

Senior Member, IEEE

Selected Harvard Activities

Committee on Higher Degrees (CHD) for Engineering Sciences (08/2017 – 06/2019)

Director of Graduate Studies for Applied Mathematics (01/2017 – 06/2017)

Committee on Higher Degrees (CHD) for Applied Mathematics (01/2017 – 06/2017)

Co-Director of Undergraduate Studies for Engineering Sciences (with Evelyn Hu, 09/2011 – 07/2012)

Freshman Advisor for Harvard College (09/2011 – 07/2012). Advised 4 students.

SEAS committees: Engineering science committee on undergraduate education (2011–2012), Committee on the new EE concentration (2011–2012), Undergraduate curriculum and education (2011–2012), EE committee on undergraduate studies (2012–2013), SEAS admissions and scholarships committee (2011–2015, chair of EE sub-committee, 2015, 2019–2020, 2020–2021), Faculty search committee: CS systems (2011 – 2012, 2016 – 2017), Faculty search committee: EE systems (2012 – 2015), Allston Working Group – Classrooms (2015 – 2016)

FAS committee: Allston course scheduling committee task force (2014 – 2015), standing committee on the S.M. degree in data science (2019–2020, 2020–2021)

Faculty Organizer of Harvard EE seminar series (2010 – 2014, spring 2017)

Ph.D. thesis committee:

Jake Marcinek (Mathematics, Ph.D., 2020)
Miriam Cha (Computer Science, Ph.D., 2019)
Benjamin Landon (Mathematics, Ph.D., 2018)
Ian Weiner (Engineering Sciences, Ph.D., 2016)
Jacob Sanders (Chemical Physics, Ph.D., 2016)
Ioannis Gkioulekas (Engineering Sciences, Ph.D., 2016)
Ying Xiong (Engineering Sciences, Ph.D., 2015)
Youngjune Gwon (Computer Science, Ph.D., 2015)
Steve Tarsa (Computer Science, Ph.D., 2015)
Kevin Dale (Computer Science, Ph.D., 2012)
Seunghoon Nam (Engineering Sciences, Ph.D., 2012)
Yongjun Kwak (Engineering Sciences, Ph.D., 2012)
Jung Ook Hong (Engineering Sciences, Ph.D., 2012)
Ayan Chakrabarti (Engineering Sciences, Ph.D., 2011)

Committee Member on Ph.D. qualifying exams:

Tianpeng Zhang (Applied Mathematics), 2021
Madeleine Barowsky (Computer Science), 2021
Blake Bordelon (Applied Mathematics), 2020
William Qian (Computer Science), 2019
Xin Chen (Engineering Sciences), 2019
Preetum Nakkiran (Computer Science), 2018
Yipei Guo (Biophysics), 2018

Selected Harvard Activities (continued)

Jialiang Wang (Computer Science), 2017
Svilen Kanev (Computer Science), 2015
Emma Alexander (Computer Science), 2015
Jie Ding (Engineering Sciences), 2014
Kevin Thompson (Applied Mathematics), 2014
Ian Weiner (Engineering Sciences), 2014
Yohsuke Miyamoto (Engineering Sciences), 2013
Kevin Chen (Computer Science), 2012
Ying Xiong (Engineering Sciences), 2012
Thiago Costa (Computer Science), 2011
Ioannis Gkioulekas (Engineering Sciences), 2011
Xudong Chen (Engineering Sciences), 2011
Youngjune Gwon (Computer Science), 2011
Yuanchen Zhu (Computer Science), 2011
John Lai (Computer Science), 2011

Teaching, Education, and Advising

ES 150: *Introduction to Probability with Engineering Applications* (Harvard SEAS, undergraduate)

This undergraduate course introduces students to probability theory and statistics, and their applications in network analysis, communications, signal processing, and other engineering problems.

Spring 2011 (Enrollment: 11, course rating: 4.2/5.0, instructor rating: 4.1/5.0)
Spring 2012 (Enrollment: 21, course rating: 4.5/5.0, instructor rating: 4.7/5.0)
Spring 2013 (Enrollment: 22, course rating: 3.8/5.0, instructor rating: 4.4/5.0)
Spring 2014 (Enrollment: 24, course rating: 4.1/5.0, instructor rating: 4.8/5.0)
Spring 2015 (Enrollment: 38, course rating: 4.5/5.0, instructor rating: 4.8/5.0)
Spring 2017 (Enrollment: 54, course rating: 4.2/5.0, instructor rating: 4.5/5.0)
Spring 2018 (Enrollment: 28, course rating: 3.8/5.0, instructor rating: 4.7/5.0)
Spring 2019 (Enrollment: 18, course rating: 4.7/5.0, instructor rating: 4.9/5.0)
Spring 2020 (Enrollment: 22, no numerical course ratings were given for this unusual semester)

ES 255: *Statistical Inference with Engineering Applications* (Harvard SEAS, graduate)

This is a graduate course on statistical detection and estimation theory. It covers topics such as hypothesis testing, optimal linear and non-linear estimation, maximum likelihood and Bayes approaches, asymptotic methods in statistics, Wiener and Kalman filtering, and Markov chain Monte-Carlo methods.

Fall 2011 (Enrollment: 6, course rating: 4.7/5.0, instructor rating: 4.8/5.0)
Fall 2012 (Enrollment: 8, course rating: 4.9/5.0, instructor rating: 5.0/5.0)
Fall 2013 (Enrollment: 4, course rating: 4.8/5.0, instructor rating: 4.8/5.0)
Fall 2017 (Enrollment: 12, course rating: 4.8/5.0, instructor rating: 5.0/5.0)

ES 254/AM 254: *Information Processing and Statistical Physics* (Harvard SEAS, graduate)

I developed this new graduate-level course on analyzing asymptotics of large random systems and algorithms using tools developed in statistical mechanics. Topics covered include large deviations techniques, high-dimensional graphical models, Bethe free energy, mean-field analysis, the replica method, TAP and cavity equations, and propagation of chaos.

Fall 2015 (Enrollment: 16, course rating: 4.4/5.0, instructor rating: 4.7/5.0)
Fall 2016 (Enrollment: 9, course rating: 4.7/5.0, instructor rating: 5.0/5.0)
Fall 2018 (Enrollment: 15, course rating: 4.5/5.0, instructor rating: 4.8/5.0)

Advanced Signal Processing: Wavelets and Applications (EPFL, graduate)

I taught this graduate-level signal processing course at EPFL in Spring 2009 and Spring 2010. It covers topics such as sampling and reconstruction on shift-invariant subspaces, perfect-reconstruction filter banks, multirate systems, and multiresolution analysis.

Teaching, Education, and Advising (continued)

Supervising undergraduate research (16 in total): Harvard College (2), UIUC (5, supported by the Intel Undergraduate Scholar Program), Zhejiang University (1), Tsinghua University (3), Peking University (1), UESTC (1), ENSTA-ParisTech (1), UTEC (1), EPFL (1)

Current group members:

Postdoctoral fellows: Dr. Julian Fageot

Ph.D. students: Hong Hu (G5), Oussama Dhifallah (G4), Weiyu Li (G1), and Xiaomin Li (G1)

Alumni of my research group:

Dr. Kyle Luh (Postdoctoral Fellow, 07/2019 – 08/2020)

Now: Assistant Professor, Department of Mathematics, University of Colorado Boulder

Dr. Junjie Ma (Postdoctoral Fellow, 08/2019 – 07/2020)

Now: Assistant Professor, Institute of Computational Mathematics, Chinese Academy of Sciences

Dr. Chuang Wang (Postdoctoral Fellow, 02/2015 – 08/2019)

Now: Associate Professor, Institute of Automation, Chinese Academy of Sciences

Dr. Wangyu Luo (Ph.D., May 2019)

Now: Developer at Five Rings Capital, NYC

Dr. Zafer Dogan (Postdoctoral Fellow, 09/2016 – 02/2018)

Now: Assistant Professor at Koç University, Turkey.

Dr. Ariana Minot (Ph.D., May 2017, co-supervised with Prof. Na Li)

Now: Member of Technical Staff at MIT Lincoln Laboratory

Dr. Chenhui Hu (Ph.D., May 2016, co-supervised with Prof. Quanzheng Li at Harvard MGH)

Now: Data Scientist at Microsoft New England

Dr. Ameya Agaskar (Ph.D., May 2015)

Now: Member of Technical Staff at MIT Lincoln Laboratory

Dr. Stanley Chan (Postdoctoral Fellow, 01/2012 – 06/2014)

Now: Associate Professor of EE and Statistics at Purdue University

Andrés Ruiz (Masters degree in EE, 08/2011 – 01/2013)

Now: Hardware Design Engineer at Apple Inc.

Publications

Preprints

- [J42-preprint] H. Hong and Y. M. Lu, “Universality Laws for High-Dimensional Learning with Random Features,” submitted, 2020 (arXiv:2009.07669 [cs.IT])
- [J41-preprint] O. Dhifallah and Y. M. Lu, “A Precise Performance Analysis of Learning with Random Features,” submitted, 2020 (arXiv:2008.11904 [cs.IT])
- [J40-preprint] H. Hu and Y. M. Lu, “Asymptotics and optimal designs of SLOPE for sparse linear regression,” submitted, 2019. (arXiv:1903.11582 [cs.IT])
- [J39-preprint] C. Wang, J. Mattingly and Y. M. Lu, “Scaling limits: Exact and tractable analysis of on-line learning algorithms with applications to regularized regression and PCA,” submitted, 2017. (arXiv:1712.04332 [cs.LG])
- [J38-preprint] O. Dhifallah, C. Thrampoulidis and Y. M. Lu, “Phase retrieval via polytope optimization: Geometry, phase transitions, and new algorithms,” submitted, 2018. (arXiv:1805.09555 [cs.IT])

Publications (continued)

[J37-preprint] A. Agaskar and Y. M. Lu, “Optimal detection of random walks on graphs: Performance analysis via statistical physics,” submitted, 2017. (arXiv:1504.06924 [cs.IT])

Journal and Highly Selective Conference

- [J38] H. Hu and Y. M. Lu, “The limiting Poisson law of massive MIMO detection with box relaxation,” *IEEE Journal on Selected Areas in Information Theory, Special Issue on Estimation and Inference*, accepted, 2020. (arXiv:2006.08416 [cs.IT])
- [J37] B. Aubin, Y. M. Lu, F. Krzakala, and L. Zdeborová, “Generalization error in high-dimensional perceptrons: Approaching Bayes error with convex optimization,” *Conference on Neural Information Processing Systems (NeurIPS)*, 2020. (arXiv:2006.06560 [stat.ML])
- [J36] F. Mignacco, F. Krzakala, Y. M. Lu and L. Zdeborová, “The role of regularization in classification of high-dimensional noisy Gaussian mixture,” *Proc. International Conference on Machine Learning (ICML)*, July 2020.
- [J35] C. Wang, H. Hu and Y. M. Lu, “A solvable high-dimensional model of GAN,” *Conference on Neural Information Processing Systems (NeurIPS)*, December 2019.
- [J34] L. Saglietti, Y. M. Lu and C. Lucibello, “Generalized approximate survey propagation for high-dimensional estimation,” *Proc. International Conference on Machine Learning (ICML)*, Long Island, June 2019. (**Oral presentation**)
- [J33] C. Wang and Y. M. Lu, “The scaling limit of high-dimensional online independent component analysis,” *Journal of Statistical Mechanics*, Special Issue on Machine Learning, Dec. 2019. (This is an updated and republished version of [J25].)
- [J32] Y. Chi, Y. M. Lu and Y. Chen, “Nonconvex optimization meets low-rank matrix factorization: An overview,” *IEEE Transactions on Signal Processing*, accepted, 2019. (arXiv:1809.09573 [cs.LG])
- [J31] G. Baechler, M. Kreković, J. Ranieri, A. Chebira, Y. M. Lu and M. Vetterli, “Super resolution phase retrieval for sparse signals,” *IEEE Transactions on Signal Processing*, vol. 67, no. 18, Sep. 2019.
- [J30] D. Simon, J. Sulam, Y. Romano, Y. M. Lu and M. Elad, “MMSE approximation for sparse coding algorithms using stochastic resonance,” *IEEE Transactions on Signal Processing*, vol. 67, no. 17, Sep. 2019. (arXiv:1806.10171 [eess.SP])
- [J29] W. Luo, W. Alghamdi and Y. M. Lu, “Optimal spectral initialization for signal recovery with applications to phase retrieval,” *IEEE Transactions on Signal Processing*, vol. 67, no. 9, May 2019. (arXiv:1811.04420 [cs.IT])
- [J28] Y. M. Lu and G. Li, “Phase transitions of spectral initialization for high-dimensional nonconvex estimation,” *Information and Inference: A Journal of the IMA*, Nov. 2019. (arXiv:1702.06435 [cs.IT])
- [J27] C. Wang, Y. C. Eldar and Y. M. Lu, “Subspace estimation from incomplete observations: A high-dimensional analysis,” *IEEE Journal of Selected Topics in Signal Processing*, vol. 12, no. 6, Dec. 2018. (arXiv:1805.06834 [cs.LG])
- [J26] L. Balzano, Y. Chi and Y. M. Lu, “A modern perspective on streaming PCA and subspace tracking: The missing data case,” *Proceedings of the IEEE*, vol. 106, no. 8, Aug. 2018. (arXiv:1806.04609 [stat.ML])

Publications (continued)

- [J25] C. Wang and Y. M. Lu, “The scaling limit of high-dimensional online independent component analysis,” *Conference on Neural Information Processing Systems (NIPS)*, December 2017. (**Spot-light paper**)
- [J24] Y. M. Lu, J. Oñativia and P. L. Dragotti, “Sparse representation in Fourier and local bases using ProSparse: A probabilistic analysis,” *IEEE Transactions on Information Theory*, vol. 64, no. 4, Apr. 2018. (arXiv:1611.07971 [cs.IT])
- [J23] R. Yin, R. Gao, Y. M. Lu and I. Daubechies, “A tale of two bases: Local-Nonlocal regularization on image patches with convolution framelets,” *SIAM Journal on Imaging Sciences*, vol. 10, no. 2, May 2017. (arXiv:1606.01377 [cs.CV])
- [J22] S. H. Chan, T. Zickler and Y. M. Lu, “Understanding symmetric smoothing filters: A Gaussian mixture model perspective,” *IEEE Transactions on Image Processing*, vol. 26, no. 11, pp. 5107–5121, 2017. (arXiv:1601.00088 [cs.CV])
- [J21] Y. Chi and Y. M. Lu, “Kaczmarz method for solving quadratic equations,” *IEEE Signal Processing Letters*, vol. 23, no. 9, September 2016.
- [J20] A. Minot, Y. M. Lu and N. Li, “A distributed Gauss-Newton method for power system state estimation,” *IEEE Transactions on Power Systems*, vol. 31, no. 5, 2016.
- [J19] I. Dokmanić and Y. M. Lu, “Sampling sparse signals on the sphere: Algorithms and applications,” *IEEE Transactions on Signal Processing*, vol. 64, no. 1, 2016
- [J18] F. Sroubek, J. Kamenicky and Y. M. Lu, “Decomposition of space-variant blur in image deconvolution,” *IEEE Signal Processing Letters*, vol. 23, no. 3, March 2016.
- [J17] D. M. Merfeld, T. K. Clark, Y. M. Lu and F. Karmali, “Dynamics of individual perceptual decisions,” *Journal of Neurophysiology*, vol. 115, no. 1, 2016.
- [J16] C. Hu, J. Sepulcre, K. A. Johnson, G. E. Fakhri, Y. M. Lu and Q. Li, “Matched signal detection on graphs: Theory and application to brain imaging data classification,” *NeuroImage*, vol. 125, pp. 587–600, 2016.
- [J15] C. Hu, L. Cheng, J. Sepulcre, K. A. Johnson, G. E. Fakhri, Y. M. Lu and Q. Li, “A spectral graph regression model for learning brain connectivity of Alzheimer’s disease,” *PLOS ONE*, vol. 10, no. 5, 2015.
- [J14] P. L. Dragotti and Y. M. Lu, “On sparse representation in Fourier and local bases,” *IEEE Transactions on Information Theory*, vol. 60, no. 12, December 2014.
- [J13] S. H. Chan, T. Zickler and Y. M. Lu, “Monte Carlo non-local means: Random sampling for large-scale image filtering,” *IEEE Transactions on Image Processing*, vol. 23, no. 8, August 2014.
- [J12] S. Maranò, D. Fäh and Y. M. Lu, “Sensor placement for the analysis of seismic surface waves: Sources of error, design criterion, and array design algorithms,” *Geophys. J. Int.*, vol. 197, no. 3, 2014.
- [J11] I. Dokmanić, R. Parhizkar, A. Walther, Y. M. Lu and M. Vetterli, “Acoustic echoes reveal room shape,” *Proceedings of the National Academy of Sciences (PNAS)*, vol. 110, no. 30, 2013.
- [J10] A. Agaskar and Y. M. Lu, “A spectral graph uncertainty principle,” *IEEE Transactions on Information Theory*, vol. 59, no. 7, pp. 4338–4356, July 2013.

Publications (continued)

- [J9] M. N. Do and Y. M. Lu, “Multidimensional filter banks and multiscale geometric representations,” *Foundation and Trends in Signal Processing*, vol. 5, no. 3, 2012.
- [J8] F. Yang, Y. M. Lu, L. Sbaiz and M. Vetterli, “Bits from photons: Oversampled Image acquisition using binary Poisson statistics,” *IEEE Transactions on Image Processing*, vol. 21, no. 4, April 2012.
- [J7] Y. M. Lu, M. Karzand, and M. Vetterli, Demosaicking by alternating projections: Theory and fast one-step implementation,” *IEEE Transactions on Image Processing*, vol. 19, no. 8, August 2010.
- [J6] A. Hormati, O. Roy, Y. M. Lu and M. Vetterli, “Distributed sampling of correlated signals linked by sparse filtering: Theory and applications,” *IEEE Transactions on Signal Processing*, vol. 58, no. 3, March 2010.
- [J5] Y. M. Lu, M. N. Do, and R. S. Laugesen, “A computable Fourier condition generating alias-free sampling lattices,” *IEEE Transactions on Signal Processing*, vol. 57, no. 5, May 2009.
- [J4] Y. M. Lu and M. N. Do, “A theory for sampling signals from a union of subspaces,” *IEEE Transactions on Signal Processing*, vol. 56, no. 6, June 2008.
- [J3] Y. M. Lu and M. N. Do, “A mapping-based design for nonsubsampled hourglass filter banks in arbitrary dimensions,” *IEEE Transactions on Signal Processing*, vol. 56, no. 4, April 2008.
- [J2] Y. M. Lu and M. N. Do, “Sampling signals from a union of subspaces,” *IEEE Signal Processing Magazine, Special Issue on Compressive Sampling*, March 2008.
- [J1] Y. M. Lu and M. N. Do, “Multidimensional directional filter banks and surfacelets,” *IEEE Transactions on Image Processing*, vol. 16, no. 4, April 2007.

Conference

- [C58] H. Hu and Y. M. Lu, “Asymptotics and optimal designs of SLOPE for sparse linear regression,” *Proc. IEEE International Symposium on Information Theory (ISIT)*, Paris, July 2019.
- [C57] W. Luo and Y. M. Lu, “A spectral method for estimating low-rank subspaces from nonlinear measurements,” *Proc. SPARS Workshop*, Toulouse, France, July 2019. (**Oral presentation**)
- [C56] O. Dhifallah and Y. M. Lu, “Fundamental limits of PhaseMax for phase retrieval: A replica analysis,” *IEEE Workshop on Computational Advances in Multi-Sensor Adaptive Processing (CAMSAP)*, December 2017. (**Best Student Paper Award, First Prize**)
- [C55] O. Dhifallah, C. Thrampoulidis and Y. M. Lu, “Phase retrieval via linear programming: Fundamental limits and algorithmic improvements,” *Proc. 55th Annual Allerton Conference on Communication, Control, and Computing*, September 2017.
- [C54] Y. M. Lu and G. Li, “Spectral initialization for nonconvex estimation: High-dimensional limit and phase transitions,” *Proc. IEEE International Symposium on Information Theory (ISIT)*, Aachen, Germany, June 2017.
- [C53] Y. Ma, Y. M. Lu and D. Baron, “Multiprocessor approximate message passing with column-wise partitioning,” *Proc. IEEE International Conference on Acoustics, Speech and Signal Processing*, New Orleans, 2017.

Publications (continued)

- [C52] C. Wang and Y. M. Lu, "Online learning for sparse PCA in high dimensions: Exact dynamics and phase transitions," *Proc. IEEE Information Theory Workshop (ITW)*, Cambridge, UK, September 2016. (arXiv:1609.02191 [cs.IT])
- [C51] J. Onativia, Y. M. Lu and P. L. Dragotti, "ProSparse denoise: Prony's based sparsity pattern recovery in the presence of noise," *Proc. IEEE International Conference on Acoustics, Speech and Signal Processing*, Shanghai, March 2016.
- [C50] G. Li, Y. Gu and Y. M. Lu, "Phase retrieval using iterative projections: Dynamics in the large systems limit," *Proc. Allerton Conference on Communications, Control, and Computing*, Monticello, October 2015.
- [C49] S. H. Chan, T. Zicker and Y. M. Lu, "Understanding symmetric smoothing filters via Gaussian mixtures," *Proc. IEEE International Conference on Image Processing*, Montreal, September 2015.
- [C48] J. Oñativia, P. L. Dragotti and Y. M. Lu, "Sparsity according to Prony, Average Performance Analysis", *Proc. SPARS Workshop*, Cambridge, UK, July 2015. (*oral presentation*)
- [C47] C. Wang, A. Agaskar and Y. M. Lu, "Randomized Kaczmarz Algorithm for Inconsistent Linear Systems: An Exact MSE Analysis", *Proc. International Conference on Sampling Theory and Applications (SampTA)*, Washington DC, May 2015.
- [C46] A. Agaskar, C. Wang and Y. M. Lu, "Randomized Kaczmarz algorithms: Exact MSE analysis and optimal sampling probabilities," *Proc. IEEE Global Conference on Signal and Information Processing (GlobalSIP)*, Atlanta, December 2014. (**Best Student Paper Award**)
- [C45] S. H. Chan and Y. M. Lu, "Efficient image reconstruction for gigapixel quantum image sensors," *Proc. IEEE Global Conference on Signal and Information Processing (GlobalSIP)*, Atlanta, December 2014.
- [C44] A. Agaskar and Y. M. Lu, "Optimal hypothesis testing with combinatorial structure: Detecting random walks on graphs," *Proc. Asilomar Conference on Signals, Systems and Computers*, Pacific Grove, November 2014.
- [C43] J. Oñativia, Y. M. Lu, and P. L. Dragotti, "Finite dimensional FRI," *Proc. IEEE International Conference on Acoustics, Speech and Signal Processing*, Florence, May 2014.
- [C42] Y. M. Lu, "A framework for adaptive parameter estimation with finite memory," *Proc. IEEE Global Conference on Signal and Information Processing (GlobalSIP)*, Austin, December, 2013.
- [C41] Y. M. Lu, "Adaptive sensing and inference for single-photon imaging," *Proc. 47th Annual Conference on Information Sciences and Systems (CISS)*, Baltimore, March 2013.
- [C40] A. Agaskar and Y. M. Lu, "Detecting random walks hidden in noise: Phase transition on large graphs," *Proc. IEEE International Conference on Acoustics, Speech and Signal Processing*, Vancouver, May 2013.
- [C39] S. H. Chan, T. Zickler and Y. M. Lu, "Fast non-local filtering by random sampling: It works, especially for large images," *Proc. IEEE International Conference on Acoustics, Speech and Signal Processing*, Vancouver, May 2013.
- [C38] Z. Sadeghipoor, Y. M. Lu and S. Süsstrunk, "A novel compressive sensing approach to simultaneously acquire color and near-infrared images on a single sensor," *Proc. IEEE International Conference on Acoustics, Speech and Signal Processing*, Vancouver, May 2013.

Publications (continued)

- [C37] C. Hu, L. Cheng, J. Sepulcre, G. E. Fakhri, Y. M. Lu and Q. Li, “Matched signal detection on graphs: Theory and application to brain network classification,” to appear in *Proc. 23rd International Conference on Information Processing in Medical Imaging (IPMI 2013)*, Asilomar, CA, June 2013.
- [C36] C. Hu, L. Cheng, J. Sepulcre, G. E. Fakhri, Y. M. Lu and Q. Li, “A graph theoretical regression model for brain connectivity learning of Alzheimer’s disease,” *Proc. International Symposium on Biomedical Imaging (ISBI)*, San Francisco, April 2013.
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