sohail.bahmani@ece.gatech.edu
sbahmani.ece.gatech.edu

Sohail Bahmani

Appointments

2013–present **Post-doctoral fellow**, *Georgia Institute of Technology*.
School of Electrical and Computer Engineering

Education

2009–2013 **PhD in Electrical and Computer Engineering**, *Carnegie Mellon University*, USA.

2007–2008 **M.A.Sc. in Engineering Science**, *Simon Fraser University*, Canada.

2002–2006 **B.Sc. in Electrical Engineering**, *Sharif University of Technology*, Iran.

Research Interests

Statistical learning theory, statistical inverse problems, high-dimensional statistics

Convex optimization, non-convex methods

Applications in machine learning and signal processing

Awards and Distinctions

2017 **Best paper award: AISTATS'17**.

2011 **John and Claire Bertucci Fellowship**.

2009 **Carnegie Institute of Technology Dean's Fellowship**.

2008 **Simon Fraser University Graduate Fellowship**.

2001 **Gold Medalist in the 19th Iranian National Mathematics Olympiad**.
participated in the Iranian national team selection camp for the 43rd International Mathematical Olympiad (IMO 2002)

Talks

Convex Programming for Statistical Estimation: A New Perspective

2020 **Department of Mathematics, The National University of Singapore**, *Jan.*, – invited.

Matrix Desketching: Unlifted but Convex

2019 **SPARS workshop**, *Jul.*

Nonlinear Regression via Convex Programming

2019 **Mathematics of Information, Data, & Signals seminar, Department of Mathematics, UC San Diego**, *Oct.*

2019 **Algorithms, Combinatorics, & Optimization seminar, UC Irvine**, *Oct.*

2019 **Department of Electrical & Computer Engineering, UC Riverside**, *Oct.*

2019 **Department of Electrical & Computer Engineering, The Ohio State University**, *Sep.*, – invited.

2019 **Texas A&M Workshop on Analysis & Probability: Randomness & Determinism in Compressive Data Acquisition**, *Jul.*, – invited.

2019 **Mathematics in Imaging at the OSA Imaging & Applied Optics Congress**, *Jun.*, – invited.

2019 **Information Theory and Applications workshop (ITA'19)**, *Feb.*

Bilinear Regression via Convex Programming without Lifting

2018 **iTWIST workshop**, *Nov.*

Rethinking Convex Programming for Statistical Estimation

2018 **Department of Electrical Engineering, University of Hawaii at Manoa**, *Mar.*, – invited.

Solving Equations of Random Convex Functions via Anchored Regression

2017 **Machine Learning Department, Carnegie Mellon University**, *Nov.*

Phase Retrieval Meets Statistical Learning Theory

2017 **IBM T.J. Watson Research Center**, *Apr.*, – invited.

2017 **Artificial Intelligence and Statistics conference (AISTATS'17)**, *Apr.*

2017 **Information Theory and Applications workshop (ITA'17)**, *Feb.*

2017 **Stochastic Seminar, School of Mathematics, Georgia Tech.**, *Feb.*

Structured Matrix Estimation in High Dimensions

2016 **School of Mathematics, University of Edinburgh**, *Jun.*, – invited.

Teaching Experience

Fall 2016 **Instructor for *Introduction to Signal Processing***, *Georgia Tech.*

Fall 2011 **TA for *Neural Signal Processing***, *Carnegie Mellon University.*

Fall 2010 **TA for *Machine Learning for Signal Processing***, *Carnegie Mellon University.*

Professional Service

Reviewership

Journals *Journal of Machine Learning Research, Journal of Fourier Analysis and Applications, SIAM Journal on Imaging Sciences, Advances in Computational Mathematics, IEEE Transactions on Information Theory, IEEE Transactions on Signal Processing, IEEE Journal on Selected Topics in Signal Processing, IEEE Signal Processing Letters*

Conferences & Workshops *AISTATS 2017, 2018, STOC 2018, IEEE ISIT 2015, SPARS 2015, IEEE CAMSAP 2013, 2015*

Publications

In Review/Revision

[1] **S. Bahmani**, "Nearly optimal robust mean estimation via empirical characteristic function," to appear in *Bernoulli*; arXiv preprint: arXiv:2004.02287 [math.ST], April 2020.

[2] **S. Bahmani** and K. Lee, "Low-rank matrix estimation from rank-one projections by unlifted convex optimization," submitted; arXiv preprint: arXiv:2004.02718 [math.ST], April 2020.

[3] **S. Bahmani** and J. Romberg, "Convex programming for estimation in nonlinear recurrent models," to appear in *Journal of Machine Learning Research*; arXiv preprint: arXiv:1908.09915 [stat.ML], August 2019.

[4] K. Lee, **S. Bahmani**, J. Romberg, and Y. Eldar, "Phase retrieval of low-rank matrices by anchored regression," to appear in *Information and Inference: A Journal of the IMA*; arXiv preprint arXiv:1910.11477 [cs.IT], 2018.

Journals

[1] **S. Bahmani** and J. Romberg, "Solving equations of random convex functions via anchored regression," *Foundations of Computational Mathematics*, 19(4):813–841, 2019.

[2] **S. Bahmani**, "Estimation from non-linear observations via convex programming with application to bilinear regression," *Electronic Journal of Statistics*, 13(1):1978–2011, 2019.

[3] **S. Bahmani**, J. Romberg, and P. Tetali, "Algebraic connectivity under site percolation in finite weighted graphs," *IEEE Transactions on Network Science & Engineering*, 5(2):86–91, 2018.

[4] **S. Bahmani** and J. Romberg, "A flexible convex relaxation for phase retrieval," *Electronic Journal of Statistics*, 11(2):5254–5281, 2017, (This article is an extended version of the AISTATS'17 paper.).

[5] **S. Bahmani** and J. Romberg, "Near-optimal estimation of simultaneously sparse and low-rank matrices from nested linear measurements," *Information and Inference: A Journal of the IMA*, 5(3):331–351, 2016.

[6] **S. Bahmani**, P. T. Boufounos, and B. Raj, "Learning model-based sparsity via projected gradient descent," *IEEE Transactions on Information Theory*, 62(4):2092–2099, 2016.

[7] **S. Bahmani** and J. Romberg, "Lifting for blind deconvolution in random mask imaging: identifiability and convex relaxation," *SIAM Journal on Imaging Sciences*, 8(4):2203–2238, 2015.

[8] **S. Bahmani** and J. Romberg, "Compressive deconvolution in random mask imaging," *IEEE Transactions on Computational Imaging*, 1(4):236–246, 2015.

[9] **S. Bahmani**, B. Raj, and P. T. Boufounos, "Greedy sparsity-constrained optimization," *Journal of Machine Learning Research*, 14(3):807–841, March 2013.

[10] **S. Bahmani** and B. Raj, "A unifying analysis of projected gradient descent for ℓ_p-constrained least squares," *Applied and Computational Harmonic Analysis*, 34(3):366–378, May 2013.

[11] **S. Bahmani**, I. Bajić, and A. HajShirMohammadi, "Joint decoding of unequally protected JPEG2000 bitstreams and Reed-Solomon codes," *IEEE Transactions on Image Processing*, 19(10):2693 –2704, October 2010.

Conferences

[1] **S. Bahmani** and J. Romberg, "Phase retrieval meets statistical learning theory: A flexible convex relaxation," In *Proceedings of the 20th International Conference on Artificial Intelligence and Statistics (AISTATS'17)*, volume 54 of *Proceedings of Machine Learning Research*, pages 252–260, Fort Lauderdale, FL, USA, 20–22 Apr 2017. PMLR, **Best paper award**.

[2] **S. Bahmani** and J. Romberg, "Sketching for simultaneously sparse and low-rank covariance matrices," In *Computational Advances in Multi-Sensor Adaptive Processing (CAMSAP'15), IEEE 6th International Workshop on*, pages 357–360, Cancun, Mexico, December 2015.

[3] **S. Bahmani** and J. Romberg, "Efficient compressive phase retrieval with constrained sensing vectors," In *Advances in Neural Information Processing Systems (NIPS'15)*, volume 28, pages 523–531. Curran Associates, Inc., December 2015.

[4] **S. Bahmani**, P. Boufounos, and B. Raj, "Greedy sparsity-constrained optimization," In *Signals, Systems and Computers (ASILOMAR'11), Conference Record of the Forty Fifth Asilomar Conference on*, pages 1148–1152, November 2011.

[5] **S. Bahmani**, I. V. Bajić, and A. HajShirMohammadi, "Improved joint source-channel decoding of JPEG2000 images and Reed-Solomon codes," In *Communications (ICC'09), IEEE International Conference on*, pages 1–5, June 2009.

[6] **S. Bahmani**, I. Bajić, and A. HajShirMohammadi, "Joint source-chanel decoding of JPEG2000 images with unequal loss protection," In *Acoustics, Speech and Signal Processing (ICASSP'08), IEEE International Conference on*, pages 1365–1368, April 2008.

Thesis

[1] **S. Bahmani**, *Algorithms for Sparsity-Constrained Optimization*, volume 261 of *Springer Thesis Series*, Springer, 2014.

Technical Report

[1] **S. Bahmani**, P. T. Boufounos, and B. Raj, "Robust 1-bit compressive sensing via gradient support pursuit," Online: arXiv:1304.6627, April 2013.

Software

Convex RNN An implementation of the convex programming for solving RNNs written in a Julia notebook.

GraSP A meta-algorithm for sparsity-constrained optimization written in MATLAB.