Sohail Bahmani

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Appointments

2013–2022	**Researcher**, *Georgia Institute of Technology*. School of Electrical and Computer Engineering

Education

2009–2013	**PhD in Electrical & 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, High-dimensional Statistics, Inverse Problems

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)

Publications

In Review/Revision

[1] **S. Bahmani**. "Instance-dependent uniform tail bound for empirical processes," arXiv preprint: `arXiv:2209.10053 [math.PR]`, 2022.

[2] B. Ancelin, **S. Bahmani**, and J. Romberg. "Decentralized feature-distributed optimization for generalized linear models," in review; arXiv preprint: `arXiv:2110.15283 [math.OC]`, 2021.

[3] S. Kim, **S. Bahmani**, and K. Lee. "Max-linear regression by scalable and guaranteed convex programming," in review; arXiv preprint: `arXiv:2103.07020 [stat.ML]`, 2021.

Journal Papers

[1] **S. Bahmani**. "Nearly optimal robust mean estimation via empirical characteristic function," *Bernoulli*, 27(3):2139–2158, 2021.

[2] **S. Bahmani** and K. Lee. "Low-rank matrix estimation from rank-one projections by unlifted convex optimization," *SIAM Journal on Matrix Analysis and Applications*, 42(3):1119–1147, 2021.

[3] **S. Bahmani** and J. Romberg. "Convex programming for estimation in nonlinear recurrent models," *Journal of Machine Learning Research*, 21(235):1–20, 2020.

[4] K. Lee, **S. Bahmani**, Y. C. Eldar, and J. Romberg. "Phase retrieval of low-rank matrices by anchored regression," *Information and Inference: A Journal of the IMA*, 10(1):285–332, 2020.

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

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

[7] **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.

[8] **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 conference paper.)

[9] **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.

[10] **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.

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

[12] **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.

[13] **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, 2013.

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

[15]   **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, 2010.

Conference Papers

[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)*, vol. 54 of *Proceedings of Machine Learning Research*, pp. 252–260, 2017. **Best paper award**.

[2]   **S. Bahmani** and J. Romberg. "Efficient compressive phase retrieval with constrained sensing vectors," in *Advances in Neural Information Processing Systems (NIPS'15)*. vol. 28, pp. 523–531, 2015.

[3]   **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*, pp. 357–360, 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*, pp. 1148–1152, 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*, pp. 1–5, 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*, pp. 1365–1368, 2008.

Thesis

[1]   **S. Bahmani**. *Algorithms for Sparsity-Constrained Optimization*, vol. 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`, 2013.

Selected Presentations

2019

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

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

Jul.	**Texas A&M Workshop on Analysis & Probability: Randomness & Determinism in Compressive Data Acquisition**, College Station, – invited.
Jul.	**SPARS'19 workshop**, Toulouse.
Jun.	**OSA Imaging & Applied Optics Congress: Mathematics in Imaging**, Munich, – invited.
Feb.	**Information Theory and Applications workshop (ITA'19)**, San Diego.

2018

Nov.	**iTWIST'18 workshop**, CIRM, Marseille.

2017

Apr.	**Artificial Intelligence and Statistics conference (AISTATS'17)**, Ft. Lauderdale.
Feb.	**Information Theory and Applications workshop (ITA'17)**, San Diego.
Feb.	**Stochastic Seminar, School of Mathematics, Georgia Tech**.

Teaching Experience

Fall 2021	**Instructor for *Fundamentals of Digital Signal Processing***, *Georgia Tech*.
Fall 2016	**Instructor for *Introduction to Signal Processing***, *Georgia Tech*.

Professional Service

Reviewership

Journals	*Journal of the European Mathematical Society,* *Probability Theorey & Related Fields,* *Journal of Machine Learning Research,* *Electronic Journal of Statistics,* *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, 2022* *STOC 2018,* *IEEE ISIT 2015,* *SPARS 2015,* *IEEE CAMSAP 2013, 2015*

Software

⬏ Convex RNN A Julia implementation of convex programming for solving RNNs.

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