

Sohail Bahmani

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Academic Appointments

2013–2022 **Postdoctoral Fellow**, *Georgia Tech.*, 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**. “Variational tail bounds for norms of random vectors and matrices,” in review; arXiv preprint: [arXiv:2503.17300](https://arxiv.org/abs/2503.17300) [[math.PR](#)], 2025.
- [2] **S. Bahmani**. “A fundamental accuracy–robustness trade-off in regression and classification,” in review; arXiv preprint: [arXiv:2411.05853](https://arxiv.org/abs/2411.05853) [[stat.ML](#)], 2024.
- [3] **S. Bahmani**. “Instance-dependent uniform tail bounds for empirical processes,” in review; arXiv preprint: [arXiv:2209.10053](https://arxiv.org/abs/2209.10053) [[math.PR](#)], 2022.

Journal Papers

- [1] S. Kim, **S. Bahmani**, and K. Lee. “Max-linear regression by convex programming,” *IEEE Transactions on Information Theory*, 70(3):1897–1912, 2024.
- [2] **S. Bahmani**. “Nearly optimal robust mean estimation via empirical characteristic function,” *Bernoulli*, 27(3):2139–2158, 2021.
- [3] **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.
- [4] **S. Bahmani** and J. Romberg. “Convex programming for estimation in nonlinear recurrent models,” *Journal of Machine Learning Research*, 21(235):1–20, 2020.
- [5] 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.
- [6] **S. Bahmani**. “Estimation from non-linear observations via convex programming with application to bilinear regression,” *Electronic Journal of Statistics*, 13(1):1978–2011, 2019.
- [7] **S. Bahmani** and J. Romberg. “Solving equations of random convex functions via anchored regression,” *Foundations of Computational Mathematics*, 19(4):813–841, 2019.
- [8] **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.
- [9] **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.)
- [10] **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.
- [11] **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.
- [12] **S. Bahmani** and J. Romberg. “Compressive deconvolution in random mask imaging,” *IEEE Transactions on Computational Imaging*, 1(4):236–246, 2015.
- [13] **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.

- [14] **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.
- [15] **S. Bahmani**, B. Raj, and P. T. Boufounos. “Greedy sparsity-constrained optimization,” *Journal of Machine Learning Research*, 14(3):807–841, 2013.
- [16] **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 (NeurIPS’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-channel 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.

Tech. Report/Unpublished

- [1] B. Ancelin, **S. Bahmani**, and J. Romberg. “Decentralized feature-distributed optimization for generalized linear models,” arXiv preprint: [arXiv:2110.15283 \[math.OC\]](https://arxiv.org/abs/2110.15283), 2021.
- [2] **S. Bahmani**, P. T. Boufounos, and B. Raj. “Robust 1-bit compressive sensing via gradient support pursuit,” online: [arXiv:1304.6627](https://arxiv.org/abs/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 Theory & 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 *AISTATS 2017, 2018, 2022*
& *STOC 2018,*
Workshops *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.