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Sohail Bahmani

Appointments

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

Research Interests

High-dimensional statistics, statistical learning theory, statistical inverse problems

Convex optimization, non-convex methods

Random graphs, spectral graph theory

Applications in signal processing, machine learning, and network analysis

Education

2009–2013 **PhD in Electrical and Computer Engineering**, *Carnegie Mellon University*, Pittsburgh, USA.
Dissertation title: *Algorithms for Sparsity-Constrained Optimization*

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

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

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**.

2002 **Silver Medalist in the 1st Silk Road Regional Mathematics Competition**.

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

Talks

Solving Equations of Random Convex Functions Efficiently

2017 **Adobe Research**, *Aug.*, – invited.

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.

Publications

In Review/Revision

[1] **S. Bahmani** and J. Romberg, "Solving equations of random convex functions via anchored regression," preprint: arXiv:1702.05327 [cs.LG], September 2017.

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

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.

Journals

[1] **S. Bahmani**, J. Romberg, and P. Tetali, "Algebraic connectivity under site percolation in finite weighted graphs," *IEEE Transactions on Network Science & Engineering*, 2017, to appear. preprint: arXiv:1612.05986 [math.PR].

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

[3] **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.

[4] **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.

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

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

[7] **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.

[8] **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.

Book

[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

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

Computer skills

Programming ● MATLAB ● C ● Julia, Visual Basic

Productivity LaTeX, LyX, Microsoft Office

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	*IEEE Transactions on Signal Processing, IEEE Signal Processing Letters, IEEE Transactions on Information Theory, SIAM Journal on Imaging Sciences, IEEE Journal on Selected Topics in Signal Processing, Journal of Fourier Analysis and Applications*
Conferences & Workshops	*IEEE CAMSAP 2013, 2015, IEEE ISIT 2015, SPARS 2015, AISTATS 2017*