Mohammadreza Soltani

Personal Data

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Research Interest

- Machine Learning/Deep learning
- High-Dimensional Statistics
- Non-convex Optimization
- Signal/Image Processing
- Computer Vision
- Information Theory

Education

Jan 2015 - Present	Ph.D. Candidate, Iowa State University (ISU), Ames, IA, USA Major: Electrical Engineering - Signal Processing Desertion Topic: Provable Algorithms for Nonlinear Models in Machine Learning and Signal Precessing Advisor: Dr. Chinmay Hegde
Jan 2013 - Dec 2014	MSc., University of Nebraska - Lincoln (UNL), Lincoln, NE, USA Major: Telecommunication Engineering Minor: Mathematics Advisor: Prof. Hamid Sharif
Sept 2009 - Oct 2011	MSc., Amirkabir University of Technology (Tehran Polytechnic), Tehran, Iran Major: Electrical Engineering - Electronics (Digital) Advisor: Prof. Ahmad Motamedi
Sept 2005 - Sept 2009	BSc., University of Guilan, Rasht, Iran Major: Electrical Engineering

Scholarships and Certificates

May 2018 - Dec 2018	Research Internship in AI Lab at Technicolor Company, Palo Alto, CA
Jan 2015 - Present	Research Assistant at Iowa State University (ISU)
Jan 2013 - May 2014	Research Assistant at University of Nebraska - Lincoln (UNL)

Publications

- **M. Soltani** and C. Hegde, "Fast Low-Rank Estimation for Ill-Conditioned Matrices", International Symposium on Information Theory (ISIT), June 2018.

- **M. Soltani** and C. Hegde, "Fast and Provable Algorithms for Learning Two-Layer Polynomial Neural Networks", (Submitted Journal), Feb 2018.

- **M. Soltani** and C. Hegde, "Towards Provable Learning of Polynomial Neural Networks Using Low-Rank Matrix Estimation", Artificial Intelligence and Statistics (AISTAT), April 2018. (**acceptance rate: %33**)

- **M. Soltani** and C. Hegde, "Fast Low-Rank Matrix Estimation without the Condition Number", (Submitted Journal), Dec 2017.

- **M. Soltani** and C. Hegde, "Towards Provable Learning of Polynomial Neural Networks Using Low-Rank Matrix Estimation", NIPS Workshop On Deep Learning: Bridging Theory and Practice (DLP), Dec 2017.

- **M.Soltani** and C. Hegde, "Demixing Structured Superposition Signals from Periodic and Aperiodic Nonlinear Observations", IEEE GlobalSIP Symposium on Sparse Signal Processing and Deep Learning, Nov 2017.

- V. Shah, **M.Soltani** and C. Hegde, "Reconstruction from Periodic Nonlinearities, with Applications to HDR Imaging", Asilomar Conference on Signals, Systems, and Computers, Nov 2017.

- **M.Soltani** and C. Hegde, "Fast Algorithms for Learning Latent Variables in Graphical Models", ACM KDD Mining and Learning With Graphs (KDD MLG), Aug 2017.

- **M.Soltani** and C. Hegde, Improved Algorithms for Matrix Recovery from Rank-One Projections, poster presentation in Midwest Machine Learning Symposium (MMLS), May 2017. (**Winner of the best poster award**)

- **M.Soltani** and C. Hegde, "Fast Algorithms for Demixing Sparse Signals from Nonlinear Observations", IEEE Transactions on Signal Processing, vol. 65, no. 16, p4209-4222, Aug 2017.

- **M.Soltani** and C. Hegde, "Stable Recovery of Sparse Vectors From Random Sinusoidal Feature Maps", International Conference on Acoustics, Speech, and Signal Processing (ICASSP), March 2017.

- **M. Soltani** and C. Hegde, "Iterative Thresholding for Demixing Structured Superpositions in High Dimensions", NIPS Workshop on Learning in High Dimensions with Structure (LHDS), Dec 2016. (**Oral presentation; acceptance rate: 2/50**)

- **M. Soltani** and C. Hegde, "A Fast Iterative Algorithm for Demixing Sparse Signals from Nonlinear Observations", IEEE GlobalSIP Symposium on Compressed Sensing and Deep Learning, Dec 2016.

- **M. Soltani** and C. Hegde, "Demixing Sparse Signals from Nonlinear Observations," Asilomar Conference on Signals, Systems, and Computers, Nov 2016.

- **M. Soltani,** M. Hempel, and H. Sharif, "Utilization of Convex Optimization for Data Fusion-driven Sensor Management in WSNs", IWCMC 2015.

- **M. Soltani,** M. Hempel, and H. Sharif, "Data Fusion Utilization for optimizing Large-Scale Wireless Sensor Networks", International Conference on Communications (ICC), 2014.

- M. Maadani, S. A. Motamedi, and **M. Soltani**, "EDCA Delay Analysis of Spatial Multiplexing in IEEE802. 11-Based Wireless Sensor and Actuator Networks", International Journal of Information and Electronics Engineering, 2(3), p.318, 2012.

- **M.Soltani,**, "A novel Tunable Opportunistic Routing Protocol for WSN Applications", Amirkabir University of Technology, Technical Report, 2012.

- M. Maadani, S. A. Motamedi, and **M. Soltani**, "Delay Analysis of MIMO-Enabled IEEE 802.11-Based Soft-Real-Time Wireless Sensor and Actuator Networks", Dela, vol. 150, p200, 2011.
- **M. Soltani,** S. A. Motamedi, S. Ahmadi, and M. Maadani, "Power-Aware and Void-Avoidant Routing Protocol for Reliable Industrial Wireless Sensor Networks", International Conference on Wireless Communications, Networking and Mobile Computing (WiCOM), 2011.

Talk and poster presentations

- **M. Soltani** and C. Hegde, "Fast and Provable Algorithms for Learning Two-Layer Polynomial Neural Networks", INFORMS Annual Meeting, Phoenix, Arizona, Nov 2018.
- **M. Soltani** and C. Hegde, "Improved Algorithms for Matrix Recovery from Rank-One Projections", Midwest Machine Learning Symposium, Chicago, June 2017.
- **M. Soltani** and C. Hegde, "Nonlinear Demixing Problem", Park City Mathematics Institute (PCMI), July 2016.
- **M. Soltani**, M. Hempel, and H. Sharif, "Data Fusion Utilization for Large-Scale Dynamic WSN Management", Poster presentation in UNL Research Fair, May 2014.

Honors and Awards

- Winner of the best poster award in Midwest ML Symposium (MMLS), June 2017.
- IEEE Signal Processing Society travel grant for participation in GlobalSip conference, Dec 2016.
- Professional Advancement Grants (PAG), Iowa State University, Nov 2016.
- Fully funded for participation in Graduate Summer School (GSS) of PCMI Summer Session, July 2016.

Teaching Experience

Fall 2017	T.A. for *Deep Learning* (course), Iowa State University (ISU)
Spring 2015 - Fall 2015	T.A. for *Signal and Systems I* (course), Iowa State University (ISU)
Fall 2014	Grader for *Electrical and Electronic Circuits* (course), University of Nebraska - Lincoln (UNL)
2011 - 2012	Private Tutor for *Engineering Mathematics, Differential Equations, and Engineering Probability and Statistic*, Iran

Reviewer

- IEEE Transaction on Signal Processing (TSP)
- IEEE Transactions on Mobile Computing (TMC)
- Multimedia Tools and Applications (MTAP)
- IEEE International Conference on Signal and Image Processing Applications (ICSIPA)
- Security and Communication Networks
- IEEE Symposium on Computer Applications & industrial Electronics
- IEEE International Conference on Signal Processing and Communications (SPCOM)

Professional Activities

- Organizing Data Science Reading Group (DSRG)
    - https://isudsrg.wordpress.com/
- Participating at ISU Future Faculty Program (FFP)

Languages

Persian (Farsi):	Mother tongue
English:	Fluent
Turkish:	Familiar

Computer Skills

Programming Language:	Python (Proficient)- Numpy, Scipy, Pandas, Beautiful Soap, Matplotlib, Seaborn, Plotly, Scikit-learn, Tensorflow, Keras Matlab (Proficient), C/C++ (familiar), OpenCV, LabVIEW, NS-2
Database:	MySQL
Big-Data Technology:	Hadoop ecosystem- Spark (familiar)
Operating System:	macOS/Linux/Windows
Front-End Web Development:	HTML, CSS, Bootstrap
Other Skills:	Latex, Git, Excel, Word, PowerPoint, Visio

References

- **Dr. Chinmay Hegde** (chinmay@iastate.edu)
  Assistant Professor, Iowa State University (ISU)

- **Prof. Hamid Sharif-Kashani** (hamidsharif@unl.edu)
  Professor, University of Nebraska-Lincoln (UNL)

- **Prof. Zhengdao Wang** (zhengdao@iastate.edu)
  Professor, Iowa State University (ISU)

- **Prof. Namrata Vaswani** (namrata@iastate.edu)
  Professor, Iowa State University (ISU)