Gauri Jagatap

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Education

Aug 2016 -*Present*	Doctor of Philosophy (PhD) in Electrical Engineering **Iowa State University** (GPA: 3.92/4)
Aug 2010 -May 2015	Bachelor of Engineering (Hons.) in Electrical and Electronics Engineering Master of Science (Hons.) in Physics **BITS Pilani University**, India (GPA: 8.69/10)

Programming Languages and Frameworks

Python, MATLAB, C, TensorFlow, PyTorch

Research Interests

Machine Learning, Statistical Learning, Signal Processing, Optimization

Work Experience

Aug 2016 -*Present*	Research Assistant at **Iowa State University**, Ames, Iowa Inverse imaging: phase retrieval, compressed sensing, super-resolution; machine learning: provable algorithms, neural network priors, deep network compression.
May 2018 -Aug 2018	Research Intern at **Mitsubishi Electric Research Laboratories (MERL)**, Cambridge, Massachusetts. Multi-modal active imaging.
Jul 2015 -Jul 2016	Project Assistant at **Indian Institute of Science**, Bengaluru, India Axial super-resolution of ultrasound images using compressed sensing.

Journal articles

Jan 2019	**G. Jagatap** and C. Hegde, "Sample-efficient algorithms for recovering structured signals from magnitude-only measurements", **IEEE Transactions on Information Theory**. (Paper).

Conference proceedings

Jul 2019	**G. Jagatap** and C. Hegde, "Linearly convergent algorithms for learning shallow residual networks", Proc. of IEEE International Symposium on Information Theory (ISIT), 2019. (Paper).
Oct 2018	**G. Jagatap**, Z. Chen, C. Hegde and N. Vaswani, "Model corrected low rank ptychography", Proc. of IEEE International Conference on Image Processing (ICIP), 2018. (Paper).
Jun 2018	**G. Jagatap** and C. Hegde, "Towards sample-optimal methods for solving random quadratic equations with structure", Proc. of IEEE International Symposium on Information Theory (ISIT), 2018. (Paper).
Apr 2018	**G. Jagatap**, Z. Chen, C. Hegde and N. Vaswani, "Sub-diffraction imaging using Fourier ptychography and structured sparsity", Proc. of IEEE International Conference on Acoustics, Speech, and Signal Processing (ICASSP), 2018 **(Oral presentation)**. (Paper).
Apr 2018	Z. Chen, **G. Jagatap**, S. Nayer, C. Hegde and N. Vaswani, "Low rank Fourier ptychography", Proc. of IEEE International Conference on Acoustics, Speech, and Signal Processing (ICASSP), 2018. (Paper).
Dec 2017	**G. Jagatap** and C. Hegde, "Fast, sample-efficient algorithms for structured phase retrieval", Adv. in Neural Information Processing Systems (NIPS), 2017. **(Acceptance rate: 20.93%)**. (Paper).

Articles

Under review

Feb 2019	**G. Jagatap**, Z. Chen, S. Nayer, C. Hegde and N. Vaswani, "Sample efficient Fourier ptychography for structured data", 2019. (Paper)
May 2019	**G. Jagatap**, and C. Hegde, "Algorithmic guarantees for inverse imaging with untrained network priors", 2019. (Paper)

Research Projects

- Inverse imaging from magnitude-only measurements. [code]
  - Phase retrieval using structured sparsity: utilizing underlying structure (such as block and tree sparsities) in images to develop fast and memory efficient algorithms to reconstruct images from absolute-valued Gaussian measurements.
- Image and video super-resolution via ptychography. [code]
  - Developed fast and memory efficient algorithm for super-resolution of multiplexed microscopic images by using sparsity priors.
  - Super-resolution for slowly changing microscopic videos, by utilizing low-rank priors.
- Optimization of shallow ReLU networks. [code]
  - Introduced a novel technique of alternating minimization in the context of training ReLU networks. Convergence analysis for learning networks of ReLUs via alternating minimization and gradient descent.
- Inverse imaging using deep untrained network priors. [code]
  - Algorithmic guarantees for solving inverse imaging problems such as compressed sensing and phase retrieval by using deep untrained generators as priors for image reconstruction.

Graduate Courses

Iowa State University

Data Analytics for ECpE, Deep Machine Learning, Optimization for Machine Learning, Convex Optimization, Nonlinear Programming, Detection and Estimation Theory, Steganography and Digital Image Forensics

Graduate Course Projects

Iowa State University

May 2017	Sparse PCA using truncated and inverse power methods; non-negative matrix factorization using orthogonal gradient method and successive projection method for topic extraction from textual database, EE 525X; IE 631X.
May 2018	Image in-painting for engineering datasets via deep projection models, ME 592.
May 2019	Classification between natural and CGI images via ResNets using Sensor Pattern Noise, CprE 535.

Scholarships and Awards

Jun 2019	Student Travel Award for ISIT 2019
Nov 2017	Travel Award for WiML 2017
Oct 2017	Student Travel Award for NIPS 2017
Aug 2016 -	Research Assistant, **Iowa State University**
2011 - 15	INSPIRE Scholarship, **Department of Science and Technology, Govt. of India**

Teaching Assistantships

Spring 2018	EE 525: Data Analytics for ECE, **Iowa State University**
Spring 2014	BITS C386: Quantum Information & Computing, **BITS Pilani University**
Fall 2012	PHY F110: Physics Laboratory, **BITS Pilani University**

Reviewing

Journal articles:
IEEE Signal Processing Letters (SPL), 2019.
IEEE Transactions on Information Theory (TIT), 2018.
IEEE Transactions on Signal Processing (TSP), 2018.
Conference articles:
Conference on Neural Information Processing Systems (NeurIPS), 2019.
International Conference on Signal Processing and Communications (SPCOM), 2018.
Women in Machine Learning (WiML) Workshop, 2017.

Professional Activities

Event coordinator, Data Science Reading Group, **Iowa State University**.

updated on July 3, 2019