

# Gauri Jagatap

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## EDUCATION

AUG 2016 -Present	Doctor of Philosophy (PhD) in ELECTRICAL ENGINEERING <b>Iowa State University</b> (GPA: 3.92/4)
AUG 2010	Bachelor of Engineering (Hons.) in ELECTRICAL AND ELECTRONICS ENGINEERING
-MAY 2015	Master of Science (Hons.) in PHYSICS <b>BITS Pilani University</b> , 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 <b>Iowa State University</b> , Ames, Iowa Inverse imaging: phase retrieval, compressed sensing, super-resolution; machine learning: provable algorithms, neural network priors, deep network compression.
MAY 2018	Research Intern at <b>Mitsubishi Electric Research Laboratories (MERL)</b> , Cambridge, Massachusetts.
-AUG 2018	Multi-modal active imaging.
JUL 2015	Project Assistant at <b>Indian Institute of Science</b> , Bengaluru, India
-JUL 2016	Axial super-resolution of ultrasound images using compressed sensing.

## JOURNAL ARTICLES

JAN 2019	<b>G. Jagatap</b> and C. Hegde, "Sample-efficient algorithms for recovering structured signals from magnitude-only measurements", <b>IEEE Transactions on Information Theory</b> . ( <a href="#">Paper</a> ).
AUG 2019	<b>G. Jagatap</b> , Z. Chen, S. Nayer, C. Hegde and N. Vaswani, "Sample efficient Fourier ptychography for structured data", <i>to appear</i> , <b>IEEE Transactions on Computational Imaging</b> . ( <a href="#">Paper</a> )

## CONFERENCE PROCEEDINGS

JUL 2019	<b>G. Jagatap</b> and C. Hegde, "Linearly convergent algorithms for learning shallow residual networks", Proc. of IEEE International Symposium on Information Theory (ISIT), 2019. ( <a href="#">Paper</a> ).
OCT 2018	<b>G. Jagatap</b> , Z. Chen, C. Hegde and N. Vaswani, "Model corrected low rank ptychography", Proc. of IEEE International Conference on Image Processing (ICIP), 2018. ( <a href="#">Paper</a> ).
JUN 2018	<b>G. Jagatap</b> and C. Hegde, "Towards sample-optimal methods for solving random quadratic equations with structure", Proc. of IEEE International Symposium on Information Theory (ISIT), 2018. ( <a href="#">Paper</a> ).
APR 2018	<b>G. Jagatap</b> , 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 ( <b>Oral presentation</b> ). ( <a href="#">Paper</a> ).
APR 2018	Z. Chen, <b>G. Jagatap</b> , S. Nayer, C. Hegde and N. Vaswani, "Low rank Fourier ptychography", Proc. of IEEE International Conference on Acoustics, Speech, and Signal Processing (ICASSP), 2018. ( <a href="#">Paper</a> ).
DEC 2017	<b>G. Jagatap</b> and C. Hegde, "Fast, sample-efficient algorithms for structured phase retrieval", Adv. in Neural Information Processing Systems (NIPS), 2017. ( <b>Acceptance rate: 20.93%</b> ). ( <a href="#">Paper</a> ).

## ARTICLES

Under review

MAY 2019	<b>G. Jagatap</b> , and C. Hegde, "Algorithmic guarantees for inverse imaging with untrained network priors", 2019. ( <a href="#">Paper</a> )
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## 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

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### 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

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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, <b>Iowa State University</b>
2011 - 15	INSPIRE Scholarship, <b>Department of Science and Technology, Govt. of India</b>

## TEACHING ASSISTANTSHIPS

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SPRING 2018	EE 525: DATA ANALYTICS FOR ECE, <b>Iowa State University</b>
SPRING 2014	BITS C386: QUANTUM INFORMATION & COMPUTING, <b>BITS Pilani University</b>
FALL 2012	PHY F110: PHYSICS LABORATORY, <b>BITS Pilani University</b>

## REVIEWING

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### 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, 2019.

## PROFESSIONAL ACTIVITIES

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Event coordinator, [Data Science Reading Group](#), **Iowa State University**.

updated on August 18, 2019