Curriculum Vitae - Ajil Jalal

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Education

University of Texas at Austin   2016-2022
M.S. and Ph.D., Electrical and Computer Engineering   GPA: 3.9/4.0
Advisor: Prof. Alexandros G. Dimakis
Interests: Generative Models, Compressed Sensing, Information and Coding Theory

Indian Institute of Technology Madras   2012-2016
Bachelor of Technology (Honours) in Electrical Engineering   GPA: 9.06/10
Advisors: Prof. Krishna Jagannathan and Prof. Rahul Vaze
Minor: Systems Engineering

Professional Experience

UC Berkeley   Berkeley, USA
Postdoctoral Researcher   2022- Present
Mentored students and pursued research in generative AI for MRI, protein design, and computational imaging.

IBM Research   Yorktown Heights, USA
Graduate Research Intern   Summer 2019
Designed algorithms for discovering causal connections in time series data.

Tata Institute of Fundamental Research   Mumbai, India
Undergraduate Research Intern   Summer 2015
Designed approximation algorithms and showed approximation bounds for an online combinatorial optimization problem.

Audience Communication Systems   Bangalore, India
Undergraduate Intern   Summer 2014
Worked on a text dependent automatic speaker recognition system.

Publications

M. Cemri, **A. Jalal**, K. Ramchandran "Discrete Diffusion Posterior Sampling for Protein Design", SPIGM Workshop, ICML 2024, Vienna, Austria.

S. Gupta, **A. Jalal**, A. Parulekar, E. Price, Z. Xun, "Diffusion Posterior Sampling is Computationally Intractable", ICML 2024, Vienna, Austria.

B. Levac, S. Kumar, **A. Jalal**, J. Tamir, "Accelerated motion correction with deep generative diffusion models", Magnetic Resonance in Medicine, 2024.

A. Jalal, J. Kang, A. Uppal, K. Ramchandran, E. Price. "Learning 1-Layer Conditional Generative Models in Total Variation", NeurIPS 2023, New Orleans, USA.

S. Ravula, B. Levac, **A. Jalal**, J.I. Tamir, A.G. Dimakis, "Optimizing sampling patterns for compressed sensing MRI with diffusion generative models", Deep Inverse, NeurIPS 2023.

R. Netzorg, **A. Jalal**, L. McNulty, G. K. Anumanchipalli, "Permod: Perceptually Grounded Voice Modification With Latent Diffusion Models", ASRU 2023.

B. Levac, **A. Jalal**, K. Ramchandran, and J. Tamir. "Conditional Score-Based Reconstructions for Multi-contrast MRI", Asilomar 2023, CA, USA. Extended version under review at IEEE TMI.

B. Levac, **A. Jalal**, and J. Tamir. "Accelerated Motion Correction for MRI using Score-Based Generative Models", ISBI 2023, Colombia.

M. Arvinte, **A. Jalal**, G. Daras, E. Price, A.G. Dimakis, and J. Tamir. "Single-Shot Adaptation using Score-Based Models for MRI Reconstruction", ISMRM 2022.

A. Jalal, M. Arvinte, G. Daras, E. Price, A.G. Dimakis, and J. Tamir. "Robust Compressed Sensing MRI with Deep Generative Priors", NeurIPS 2021.

A. Jalal, S. Karmalkar, A.G. Dimakis, and E. Price. "Instance-Optimal Compressed Sensing via Posterior Sampling", ICML 2021.

A. Jalal, S. Karmalkar, J. Hoffmann, A.G. Dimakis, and E. Price. "Fairness for Image Generation with Uncertain Sensitive Attributes", ICML 2021.

G. Daras, J. Dean, **A. Jalal**, and A.G. Dimakis. "Intermediate Layer Optimization for Inverse Problems using Deep Generative Models", ICML 2021.

E. Balevi, A. Doshi, **A. Jalal**, A.G. Dimakis, and J.G. Andrews "High-dimensional channel estimation using generative models", IEEE JSAC Series on Machine Learning for Communications and Networks, January 2021.

A. Jalal, L. Liu, A.G. Dimakis, and C. Caramanis. "Robust compressed sensing using generative models", NeurIPS 2020, Vancouver, Canada.

A. Jalal, S. Karmalkar, A.G. Dimakis, and E. Price. "Compressed sensing with approximate priors via conditional resampling," Workshop on Deep Learning and Inverse Problems, NeurIPS 2020, Vancouver, Canada.

G. Ongie, **A. Jalal**, C. Metzler, R. Baraniuk, A.G. Dimakis, and R. Willett "Deep learning techniques for inverse problems in imaging", IEEE Journal on Selected Areas in Information Theory, 2020.

Q. Lei, **A. Jalal**, I. S. Dhillon, and A.G. Dimakis. "Inverting Deep Generative models, One layer at a time.", NeurIPS 2019, Vancouver, Canada.

D. Van Veen, **A. Jalal**, E. Price, S. Vishwanathan, and A.G. Dimakis. "Compressed Sensing Recovery of Medical Images using Deep Image Prior" Med-Neurips 2018, Montreal, Canada.

Ashish Bora, **Ajil Jalal**, Eric Price, Alexandros G. Dimakis. "Compressed Sensing Using Generative Models", ICML 2017, Sydney, Australia.

Umang Bhaskar, **Ajil Jalal**, Rahul Vaze. "The Adwords Problem with Strict Capacity Constraints", FSTTCS 2016, Chennai, India.

Patents **A. Jalal**, K. Shanmugan, B. Vinzamuri, "Root Cause Analaysis using Granger Causality". Patent number US11238129B2.

Talks **Invited Talk**. Stanford University, November 2023.

Invited Talk. Youth in High Dimensions, The Abdus Salam International Centre for Theoretical Physics, Trieste, Italy, May 2023.

Invited Talk. ITA Workshop, San Diego, USA, February 2023.

Invited Talk. IIT Madras, Chennai, India, January 2023.

Invited Talk. Berkeley MR-ML group meetings, Berkeley, September 2021.

Invited Talk. Symposium on Generative Regularization Approaches for Inverse Problems, Conference on System Modelling and Optimization, IFIP TC7 Quito, Ecuador, September 2021.

Oral Presentation. "Compressed sensing with approximate priors via conditional resampling," NeurIPS 2020 workshop on Deep Learning and Inverse Problems; Vancouver, Canada.

Invited talk. "Deep Generative Models and Inverse Problems," Asilomar Conference on Signals, Systems, and Computers, 2019; California, USA.

Oral Presentation. "Compressed sensing using deep image prior for medical imaging," Med-NeurIPS 2018; Montreal, Canada.

Honors	**Karnataka Regional Mathematical Olympiad** scholar. Attended the **Indian National Mathematical Olympiad (INMO)** camp and represented Karnataka in the INMO, 2011.

Kishore Vaigyanik Protsahan Yojana (KVPY) fellow, 2012.

Finalist, **Qualcomm Innovation Fellowship**, 2020.

Service

- Co-lead organizer of the Deep Learning and Inverse Problems workshop at NeurIPS 2023.
- Lead organizer of the Deep Learning and Inverse Problems coffee social at NeurIPS 2019, Vancouver, Canada.

Reviewer: NeurIPS 2018-; ICML 2018-; ICLR 2020-; IEEE Transactions on Information Theory; IEEE Transactions on Signal Processing; Journal on Selected Areas in Information Theory (JSAIT); MLSys 2020; AAAI 2019; UAI 2019; AISTATS 2018.

Teaching Experience

University of Texas at Austin:

Teaching Assistant, EE351K: Introduction to Probability and Statistics	Spring 2017
Teaching Assistant, EE360C: Algorithms	Fall 2016

Skills

Programming languages: Python, C, C++.
Software and Libraries: Tensorflow, PyTorch, Matlab, LaTeX, Numpy, Scipy.

Relevant Courses

Machine Learning	Information Theory
Unsupervised Learning	Learning Theory
Error Control Coding	Convex Optimization: Theory and Algorithms
Probability and Stochastic Processes	Approximation Algorithms
Randomized Algorithms	Advanced Concentration Inequalities
Pseudorandomness	Theory of Probability
Adaptive Signal Processing	Theory of Computation