

Angela F. Gao

CONTACT INFORMATION	California Institute of Technology 1200 E. California Blvd M/C 305-16 Pasadena CA 91104	afgao@caltech.edu https://angelafigao.github.io/
RESEARCH INTERESTS	Computational imaging, computational photography, computer vision, image processing, inverse problems, and machine learning.	
EDUCATION	California Institute of Technology , Pasadena, CA, USA <i>Ph.D. in Computing and Mathematical Science</i> • Candidacy topic: <i>Solving Inverse Problems with Missing Information</i> , November 2022 • Advisor: Katherine L. Bouman	Oct 2019 - Present
	Carnegie Mellon University , Pittsburgh, PA, USA <i>B.S. in Electrical and Computer Engineering with University Honors, Additional Major in Biomedical Engineering</i> • GPA: 3.84 (overall), 3.88 (ECE), 3.90 (BME) • Dean's List: F16, F17, S18, F18	2015 - 2018
PROFESSIONAL EXPERIENCE	Google Research - Mountain View, CA <i>Student Researcher working with the Google Accelerated Sciences team on cell phone microscopy.</i>	Summer 2022
	National Institutes of Health, NHLBI - Bethesda, MD <i>Summer Research Intern mentored by Dr. Peter Kellman and Dr. Hui Xue developing methods for cardiac MRI.</i>	Summer 2019
	Carnegie Mellon University - Pittsburgh, PA <i>Undergraduate Researcher mentored by Dr. Aswin Sankaranarayanan designing algorithms for illumination source separation.</i>	2018-2019
	École Polytechnique Fédérale de Lausanne - Lausanne, Switzerland <i>Summer@EPFL Intern mentored by Dr. Elisa Celis studying contagion in social networks in the ADD Health dataset.</i>	Summer 2018
	Princeton University - Princeton, NJ <i>Summer Research Intern mentored by Dr. Adam Finklestein and Dr. Szymon Rusinkiewicz working on 3D reconstruction of plaster postcard records called sonorines.</i>	Summer 2017
HONORS AND AWARDS	Caltech EAS New Horizons Award for Diversity, Equity, and Inclusion California Institute of Technology Graduate Research Fellowship Program Honorable Mention National Science Foundation Graduate Research Fellowship Program Honorable Mention National Science Foundation	2023 2020 2019

PEER REVIEWED
CONFERENCE
PUBLICATIONS

* **denotes equal contribution**

AF Gao*, O Leong*, H Sun, and KL Bouman. “Image Reconstruction without Explicit Priors.” *International Conference on Acoustics, Speech, and Signal Processing (ICASSP)*, 2023. (Selected for an oral presentation at ICASSP 2023 special session on Robustness in Modern Computational Imaging).

AF Gao, JC Castellanos, Y Yue, ZE Ross, KL Bouman. “DeepGEM: Generalized Expectation-Maximization for Blind Inversion”. *Proceedings of the 35th Conference on Neural Information Processing Systems (NeurIPS)*, 2021. (Selected for oral presentation at AGU 2021).

AF Gao, B Rasmussen, P Kulits, EL Scheller, R Greenberger, BL Ehlmann. “Generalized Unsupervised Clustering of Hyperspectral Images of Geological Targets in the Near Infrared”. *Proceedings of the Conference and Workshop of Computer Vision and Pattern Recognition: Perception Beyond the Visible Spectrum Workshop*, 2021. (Invited for oral presentation at AGU 2021).

JOURNAL
PUBLICATIONS

O Leong*, **AF Gao***, H Sun, and KL Bouman. “Discovering Structure From Corruption for Unsupervised Image Reconstruction.” *IEEE Transactions on Computational Imaging*, 2023.

Y Yang, **AF Gao**, ZE Ross, K Azizzadenesheli, and RW Clayton. “Rapid Seismic Waveform Modeling and Inversion with Neural Operators.” *IEEE Transactions on Geoscience and Remote Sensing*, 2023.

Y Yang*, **AF Gao***, JC Castellanos*, ZE Ross, K Azizzadenesheli, and RW Clayton. “Seismic wave propagation and inversion with Neural Operators,” *The Seismic Record*, 2021.

IN SUBMISSION

Y Lin*, **AF Gao***, and KL Bouman. “Imaging an evolving black hole by leveraging shared structure.”

TEACHING
EXPERIENCE

Guest Lectures

DeepGEM: Generalized Expectation-Maximization for Blind Inversion,
CS 159 Advanced Topics in Machine Learning, Caltech. May 2022

Teaching Assistant

CS 101: Projects in Machine Learning, Caltech	Fall 2023
CS 166: Computational Cameras, Caltech	Spring 2022
CS 101: Projects in Machine Learning, Caltech	Fall 2021
18-290: Signals and Systems, CMU	Fall 2018
18-290: Signals and Systems, CMU	Spring 2018
15-151: Mathematical Foundations of Computer Science, CMU	Fall 2017
21-127: Concepts of Mathematics, CMU	Spring 2018
21-127: Concepts of Mathematics, CMU	Fall 2017

TALKS

Invited Talks

Image Reconstruction without Explicit Priors Max Planck Institute for Radio Astronomy Meeting, virtual. July 2023

Image Reconstruction without Explicit Priors ngEHT AI Working Group Meeting, virtual. May 2023

DeepGEM: Generalized Expectation-Maximization for Blind Inversion, Harvard Medical School Laboratory of Computational Neuroimaging, virtual. January 2022

Deep Expectation-Maximization for Joint Source-Structure Inversion, Caltech Seismological Laboratory Lunch Seminar, Pasadena, CA. November 2021

Other Talks

Solving Inverse Problems with Missing Information, Candidacy Presentation, November 2022

DeepGEM: Generalized Expectation-Maximization for Blind Inversion, Rice Computational Imaging Reading Group. June 2022

Selecting and Learning a Prior from Noisy Data, Southern California Applied Mathematics Symposium, Harvey Mudd College. May 2022

DeepGEM: Generalized EM for Blind Seismic Tomography, Beyond Limits, Pasadena, CA. June 2021

CONFERENCES
ATTENDED

Bay Area Vision Conference 2023 (poster presentation), ICCP 2022 (poster presentation), CVPR 2022 (workshop poster presentation), AGU 2021 (2 oral presentations), NeurIPS 2021 (virtual, poster presentation), ICCP 2021 (virtual, spotlight presentation), ICCP 2020 (virtual)

WORKSHOPS
ATTENDED

KISS Study on "Beyond Interstellar: Extracting Science from Black Hole Images" Part 2, Pasadena, CA, March 2021

KISS Study on "Beyond Interstellar: Extracting Science from Black Hole Images" Part 1, Pasadena, CA, October 2019

ACADEMIC
SERVICE

Reviewer, CMS PhD Application Admissions Review, Caltech 2022
Committee, Engineering and Applied Sciences Division Committee on Diversity, Inclusion, and Equity, Caltech 2021-2022
Committee, Computing and Mathematical Sciences Steering Committee on Diversity, Inclusion, and Equity, Caltech 2020-Present
Steering Committee, Women in CMS, Caltech 2019-Present
President, Biomedical Engineering Society, Carnegie Mellon University 2018-2019
Social Chair, Biomedical Engineering Society, Carnegie Mellon University 2017-2018

MENTORSHIP

Equivariant posterior learning Spring 2023

Rohun Agrawal, Caltech undergrad

Imaging an evolving black hole by leveraging shared structure 2022-2023

Yvette Lin, former Caltech undergrad

Probabilistic phase picking Fall 2021

CS-101 group: Agnim Agarwal, Emily Zheng, Ningxuan Dai, Rohan Mirchandani

OUTREACH

Caltech Y Rise Tutoring, California Institute of Technology, Pasadena, CA 2019-2021

Alpha Phi Omega, Carnegie Mellon University, Pittsburgh, PA
250+ volunteer hours

2016-2019