

Yansong Gao



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Research interests Transfer learning, Unsupervised learning, Diffusion-based generative models, Information theory, Bayesian deep learning, Uncertainty quantification, Algorithmic game theory

Education **University of Pennsylvania** Philadelphia, PA
PhD Candidate in Applied Math Sept. 2017 – Present
Advisor: Pratik Chaudhari. *GPA: 3.95/4.0*

Shanghai Jiao Tong University Shanghai, China
BA in Mathematics, minor in Physics Sept. 2013 – May 2017
Advisor: Yaokun Wu. *GPA: 93.2/100.*

Experience **Computer Vision Research Intern**
Advisor: Xin Zhou and Zhihong Pan May. 2022 – Sept. 2022
Generative Models, Diffusion-based Generative Modeling
Baidu Research, Sunnyvale, California, United States

Research Assistant
Ph.D Advisor: Pratik Chaudhari Sept. 2019 – Present
GRASP Robotics Laboratory, University of Pennsylvania

Honors and scholarships National High School Mathematics Olympiad League, First Prize 2012
Chinese Physics Olympiad, First Prize 2012
Academic Excellent Scholarship 2014-2015
National Scholarship 2015-2016
Benjamin Franklin Fellowship 2017-2019

Selected publications **Deep Reference Priors: What is the best way to pre-train a model?**
Yansong Gao, Rahul Ramesh, Pratik Chaudhari.
ICML, 2022.
Beyond the worst-case analysis of random priority: Smoothed and average-case approximation ratios in mechanism design

	<p>Xiaotie Deng, Yansong Gao, Jie Zhang <i>Information and Computation 2022</i> An Information-Geometric Distance on the Space of Tasks Yansong Gao, Pratik Chaudhari. <i>ICML, 2021.</i> A Free-Energy Principle for Representation Learning Yansong Gao, Pratik Chaudhari. <i>ICML, 2020.</i> Average-case Analysis of the Assignment Problem with Independent Preferences Yansong Gao, Jie Zhang. <i>IJCAI, 2019.</i> Smoothed and Average-case Approximation Ratios of Mechanisms: Beyond the Worst-case Analysis Xiaotie Deng, Yansong Gao, Jie Zhang. <i>MFCS, 2017.</i> Comparison of Scheduling Mechanisms from a Average-case Analysis Lens Yansong Gao, Jie Zhang. <i>In Review, 2022.</i></p>	
Talks	<p>NeurIPS 2020 Workshop: Deep Learning through Information Geometry Contributed Talk: An Information-Geometric Distance on the Space of Tasks</p> <p>ICLR 2020 Workshop: Deep Neural Models and Differential Equations Contributed Talk: A Free-Energy Principle for Representation Learning</p> <p>International Conference on Machine Learning(ICML) 2020 Title: A Free-Energy Principle for Representation Learning</p>	
Skills	<p>Programming Proficient in: Python, PyTorch, MatLab, LATEX. Familiar with: C, C++, TensorFlow.</p>	
Teaching experience	<p>Teaching Assistant, ESE Department (Upenn) Fall 2019 ESE 546: Principles of Deep Learning</p> <p>Teaching Assistant, Department of Mathematics (Upenn) Spring 2018 MATH 210: Math in the Media</p> <p>Recitation Instructor, Department of Mathematics (Upenn) Fall 2018 MATH 104: Calculus</p>	
Graduate Courses	Representation Learning in Computer Vision	Deep Learning

Statistical Mechanics	Optimization Methods in Machine Learning
Mathematical Statistics	Advanced Topics in Mathematical Statistics
Advanced Probability	Stochastic Processes
Numerical Linear Algebra	Geometric Methods in Computer Science
Functional Analysis	Real and Complex Analysis
Combinatorial Analysis and Graph Theory	Algebra
Condensed Matter Physic	

Other interests

Soccer.