

# MANASI SHARMA

AI Research Scientist at MIT Lincoln Lab; MS in CS from Stanford Univ.; BA in CS from Columbia Univ.

Domain Expertise: Generative AI, Natural Language Processing, Machine Learning, Reinforcement Learning, Computer Vision

[manasis@cs.stanford.edu](mailto:manasis@cs.stanford.edu) | [www.linkedin.com/in/manasi1](http://www.linkedin.com/in/manasi1) | [manasi-sharma.github.io](http://manasi-sharma.github.io) | San Francisco, CA

## EDUCATION

**Stanford University, Stanford, CA**

Sep '21 - Jun '23

M.S. in Computer Science (AI/ML Track), GPA: **3.96/4.00**

Research: 'Language-Conditioned Diffusion Models for Robot Learning' under Prof. Dorsa Sadigh

**Columbia University, New York, NY**

Aug '17 - Jun '21

B.A. in Computer Science with concentration in Physics, GPA: **3.81/4.00**

**Key Courses:** Natural Language Processing, ML with Graphs, Trustworthy ML, Decision Making under Uncertainty, Deep Learning for Computer Vision, Data Str. & Algorithms, Prob. & Statistics, Lin. Algebra, Interactive Robotics, Robot Autonomy

## WORK EXPERIENCE

**MIT Lincoln Laboratory, Lexington, MA**

Aug '23 - Present

AI Research Scientist, Artificial Intelligence Technology Group

San Francisco, CA (Remote)

- Spearheaded an AI project on exploring Large Language Model (LLM) explainability & trust (ICML workshop '24) & built an open-source framework for testing LLM agents ([llm-sandbox](#)). Conducted research on the feasibility of LLMs in high-stakes decision-making, as part of a multi-year collaboration of the Lab with MIT Prof.s Philip Isola & Jacob Andreas.
- Architected an internal tool for efficient evaluation of a Retrieval Augmented Generation (RAG) system with over 15 distinct metrics & assessed it on referencing past recordings in a speech-to-text application, achieving 92% acc.

**Renault-Nissan-Mitsubishi Alliance Innovation Lab, Santa Clara, CA**

Jun '22 - Sep '22

Research Intern, Autonomous Vehicles

- Engineered an end-to-end LiDAR 3D point-cloud classification system in Python & C++ for Nissan Autonomous Vehicles, which achieved >95% accuracy, ~2% FPR and 85% reduction in runtime on classifying real-world cars, pedestrians, cyclists, etc. The system has been deployed in Nissan Autonomous Vehicles beginning Winter '22.

**Stanford University, School of Engineering, Stanford, CA**

Mar '22 - Jun '23

Graduate Teaching Assistant for over 4 quarters for 3 of the most popular CS classes at Stanford (>600 students):

- [CS224N](#) (NLP, Prof. Manning), [CS231N](#) (CV, Prof. Fei-Fei Li) and [CS230](#) (Deep Learning, Prof. Andrew Ng)
- Managed weekly 'Discussion Sections' of 75+ students; held office hours, constructed & graded HWs. Received >95% excellent reviews ('Very/Extremely Effective'). Received commendation for CS 224N (tutorial featured on YouTube).

**Columbia University, Department of Mathematics, New York, NY**

Sep '19 - Jun '21

Undergraduate Teaching Assistant for Calculus III (across 4 semesters)

## RESEARCH EXPERIENCE

**Stanford University, Stanford Vision Laboratory & ILIAD Robotics Lab**

Sep '21 - Jun '23

Research Intern (Prof. Dorsa Sadigh, Prof. Fei-Fei Li, Prof. Jiajun Wu)

- Co-led a project on using few-shot prompting for LLMs to recognize patterns in trajectory data (NIPS workshop '23) & another on using diffusion models for trajectory generation conditioned on Language.
- Led the development of the Knowledgebase for [iGibson](#) and [BEHAVIOR-1K](#), an ImageNet-scale robotic simulation benchmark. Accepted for CoRL '22 and nominated for 'Best Paper' award. Presented live tutorial at ECCV '22.

**Columbia University, Data Science Institute**

Sep '19 - Jun '21

Research Intern, Dept. of CS & Astronomy (Prof. Daniel Hsu and Prof. Zoltan Haiman)

- Discovered that 89% of the output of a popular neural network used in Astronomy was counterintuitively attributable to negative image regions (voids, black holes, etc.). Published results in APS Physical Review '20.

**California Institute of Technology, Division of Physics, Mathematics and Astronomy**

Jun '19 - Aug '19

Visiting Undergraduate Research Program (VURP) Intern, Palomar Gattini-IR Group (Prof. Mansi Kasliwal)

- Pioneered the development of a flagship image classification system for Caltech's Gattini-IR Telescope using TensorFlow which achieved ~97.5% accuracy on thousands of cosmic transient sources. Published results in PASP '20. Deployed the model in the Telescope's data processing pipeline (still active), replacing the manual classification process.

## TECHNICAL SKILLS

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- Programming Languages: Proficient: Python, C++/C, ROS, CUDA, Java, JavaScript, LaTeX; Familiar: Julia, SQL, SQLite
- Frameworks: TensorFlow, Keras, PyTorch, Scikit-Learn, NLTK, PyBullet, MeshLab, NetworkX, PyG, OpenCV
- Tools: Colab/GCP, Jupyter Notebooks, Visual Studio, Git, MySQL (Familiar), Figma

## PUBLICATIONS

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- **M. Sharma**, HC Siu, et. al. "Why Would You Suggest That? Human Trust in Language Model Responses". *ICML Humans, Algorithmic Decision-Making and Society Workshop*. <https://icml.cc/virtual/2024/38213> Jun '24
- **M. Sharma**, Y. Cui, "Exploring and Improving the Spatial Reasoning Abilities of Large Language Models". *NeurIPS Instruction Tuning and Following Workshop*. <https://neurips.cc/virtual/2023/79628> Oct '23
- C. Li, C. Gokmen..., **M. Sharma**..., "BEHAVIOR-1K: A Benchmark for Embodied AI with 1,000 Everyday Activities and Realistic Simulation" in *Conference on Robot Learning (CoRL)*. Nominated for 'Best Paper'. June '22
- J. Matilla, **M. Sharma**, D. Hsu, Z. Haiman, "Interpreting deep learning models for weak lensing" in *Physical Review D*, 102(12). <https://doi.org/10.1103/physrevd.102.123506> Dec '20
- K. De, M.J. Hankins..., **M. Sharma**..., "Palomar Gattini-IR: Survey Overview, Data Processing System, on-Sky Performance and First Results." *Publications of the Astronomical Society of the Pacific*, vol. 132. <https://doi.org/10.1088/1538-3873/ab6069> Feb '20

## GRADUATE COURSE PROJECTS

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- **Debiasing Models for Out-of-domain Generalization** - CS224N (NLP for Deep Learning)  
Exceeded BERT's performance on out-of-domain question-answering data by 2.5% by using debiasing models ([link](#)).
- **Crowd Aware Intent-based Reinforcement Learning** - CS333 (Algorithms for Interactive Robotics)  
Reduced collision rate in crowd navigation by 50% by leveraging human latent intent reinforcement learning ([link](#)).
- **Predicting Drug Interactions with Graph Neural Networks** - CS224W (Machine Learning with Graphs)  
Used the Graph Isomorphism Network to exceed 11<sup>th</sup> place on ogbl-ddli leaderboard ([link](#), selected for course [website](#)).
- **Optimizing Wind Turbine Placement Subject to Turbine Wakes** - CS238 (Decision Making Under Uncertainty)  
Applied Q-Learning to windfarms to generate sensible layouts that maximize power, subject to wake constraints ([link](#)).
- **LIMES: LIME for Image Segmentation** - CS329T (Trustworthy Machine Learning)  
Devised a LIME algorithm variant for facial segmentation that achieves explainability like gradient-based methods.
- **Monte-Carlo Tree Search Player** - CS227B (General Game Playing)  
Designed a player to play any game, using MCTS, multi-threating, grounding, etc.; placed 8<sup>th</sup> in the class ([link](#)).

## LEADERSHIP ROLES

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- Graduate Community Chair, Women in Computer Science, Stanford University Jun '22 – Jun '23
- Founder & Project Leader, [COVID-19 Public Hub](#) website highlighting Columbia research Apr '20 - Jun '21
- Corporate Chair, Women in Computer Science, Columbia University Apr '20 - Jun '21
- Class 3 Curriculum Developer (AI section), Girls Who Code, Columbia University Feb '20 - Aug '20
- Executive Board UG Student Coordinator, Columbia Society for Women in Physics Sep '18 - Sep '19
- Captain, 'Columbia Raas' Dance Team (member since Sep 2017), Columbia University Apr '20 - Jun '21

## HONORS

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- 1 of 25 students accepted to the highly selective Pear Garage program for Entrepreneurship at Pear VC Oct '22
- 1 of 18 accepted to the highly selective [GFS](#) (Graduate Fellowships for STEM Diversity) Program Mar '22
- 1 of 50 accepted into Google's CS Research Mentorship Program ([CSRMP](#)), Class of 2022A Feb '22
- Selected for the final round of the GEM Fellowship Jan '22
- Dean's List (in 6 out of 7 graded semesters, awarded to top 20%), Columbia University Fall '17 - Fall '20
- Columbia Undergraduate Research Fellowship (URF), Columbia College Summer Funding Program May '20
- Visiting Undergraduate Research Program (VURP) Award, California Institute of Technology May '19
- 1 of 25 awarded Laidlaw Undergraduate Research & Leadership Scholarship, Columbia Univ. '18 - '19
- Andy Grove Scholarship for Intel Employees' Children, Intel Foundation Fall '19

## OTHER

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- Languages: Hindi (fluent), Spanish (intermediate)