MANASI SHARMA

Graduate Student in Computer Science (AI/ML Track) at Stanford University
Interests in AI, Generative AI, Machine Learning, Reinforcement Learning, Deep Learning, Computer Vision
Experience in Language Models & LLMs, Diffusion Models, Decision Making, Autonomous Vehicles, Perception & 3D Vision
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EDUCATION

Stanford University, School of Engineering *Sep '21 - Jun '23*
M.S. in Computer Science (AI/ML Track), Current GPA: **3.96/4.00**
Research: 'Language-Conditioned Diffusion Models for Robot Learning' under Prof. Dorsa Sadigh

Columbia University, Columbia College *Aug '17 - Jun '21*
B.A. Computer Science with concentration in Physics, GPA: **3.81/4.00**

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

WORK EXPERIENCE

Renault-Nissan-Mitsubishi - Alliance Innovation Lab *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 is has been deployed in Nissan Autonomous Vehicles beginning Winter '22.*

Stanford University, School of Engineering *Mar '22 - Dec '22*
Teaching Assistant for C224N (NLP, Prof. Manning), CS231N (CV, Prof. Fei-Fei Li) and CS230 (Deep Learning, Prof. Andrew Ng)
- TA for the most popular CS classes at Stanford (>600 students). Managed weekly 'Discussion Sections' of 75+ students; held office hours, constructed & graded HWs. Received >95% excellent reviews ('Very/Extremely Effective').
- Offered Head TA positions for CS230 and CS231N, and received commendation for CS 224N (recorded sections were selected to be featured on YouTube).

Columbia University, Department of Mathematics *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 - Present*
Research Intern (Prof. Fei-Fei Li, Prof. Jiajun Wu, Prof. Dorsa Sadigh)
- Co-leading one project on using diffusion models for trajectory generation conditioned on a language instruction, in a shared autonomy setup with input from both human and robot, and another on using LLMs as zero-shot labelers of patterns in trajectory data.
- 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. Targeted explainability & trustworthiness of neural networks in the traditional field of Astronomy using Saliency Maps.

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

- 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

- 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

- **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 11th 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).
- **TurtleBot Autonomous System -** CS237A (Principles of Robot Autonomy)
- **LIMES: LIME for Image Segmentation -** CS329T (Trustworthy Machine Learning)
- **Monte-Carlo Tree Search Player -** CS227B (General Game Playing)

LEADERSHIP ROLES

- Graduate Community Chair, Women in Computer Science, Stanford University *Jun '22 - Present*
  - *Spearheaded the integration of MS graduate students through mixers and alumni panels.*
- 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

- 1 of 25 accepted to the highly selective Pear Garage program for Entrepreneurship; *Oct '22*
  - *Actively engaged in networking and build sessions with VCs and investors in the generative AI space*
- 1 of 18 accepted to the highly selective GFSD (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

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