

Arjun Mani

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EDUCATION

Columbia University

Sep 2021-Present

Ph.D. Candidate in Computer Science.
M.S. in Computer Science [Sep 2021-Feb 2024].

Advisors: Carl Vondrick, Richard Zemel.

- Research interest: developing fundamental advances in AI systems for accelerating scientific design and discovery.
- My most recent work introduces a more realistic problem setting for lab-in-the-loop design optimization, where an experiment returns high-dimensional ‘auxiliary’ information beyond a scalar reward [1]. We develop a novel method tailored to this setting and demonstrate that it significantly accelerates design optimization across different domains, such as robot hardware design.
- Previously, we introduced a novel approach for ML-based fluid simulation [2]. While learned GNN models for particle-based simulation struggle to scale to large scenes, our method addresses this limitation by modeling solid surfaces using implicit 3D representations. This approach enables more scalable and accurate simulation of fluid–surface interactions.

Princeton University

Sep 2017-May 2021

B.S.E. Computer Science, Summa Cum Laude

GPA: 3.85/4.0

Minor in Applied Mathematics

PUBLICATIONS & PREPRINTS

[1] **Arjun Mani**, Carl Vondrick, and Richard Zemel. Few-Shot Design Optimization by Exploiting Auxiliary Information. *arXiv preprint*, 2026 (Under submission). [[Arxiv](#)] [[Project Website](#)]

[2] **Arjun Mani**, Ishaan Preetam Chandratreya, Elliot Creager, Carl Vondrick, and Richard Zemel. SurfsUp: Learning Fluid Simulation for Novel Surfaces. *International Conference on Computer Vision (ICCV)*, 2023. [[Arxiv](#)] [[Project Website](#)]

[3] **Arjun Mani**, Nobline Yoo, Will Hinthon, and Olga Russakovsky. Point and Ask: Incorporating Pointing into Visual Question Answering. *Computer Vision and Pattern Recognition (CVPRW) Visual Question Answering Workshop*, 2021. [[Arxiv](#), [Full Paper](#)] [[Workshop Talk](#)]

[4] Assaf Hoogi, **Arjun Subramaniam**, Rishi Veerapaneni, and Daniel L. Rubin. Adaptive Estimation of Active Contour Parameters Using Convolutional Neural Networks and Texture Analysis. *IEEE Transactions on Medical Imaging*, 36(3), 781-791 (March 2017). [[Paper](#)]

AWARDS AND FELLOWSHIPS

NSF Graduate Research Fellowship. Awarded to support Ph.D. research.

2021

Hertz Fellowship (Finalist).

2021

Selected as one of 48 finalists from over 900 applications.

Princeton Sigma Xi Book Award for Outstanding Undergraduate Research.

2021

Princeton Outstanding Computer Science Senior Thesis Prize. 2021
My research extended visual question answering to grounded questions involving pointing gestures. [Paper](#)

Best Overall Project, Princeton Applied and Computational Mathematics (PACM). 2021
Introduced the use of geometric algebra for embedding words, which improved solving of analogies. [Paper](#)

CRA Outstanding Undergraduate Researcher Award (Honorable Mention). 2021

Regeneron Science Talent Search (Finalist). 2017
High-school research on using deep learning to identify mutations that improve antibody binding affinity.

SELECTED COURSEWORK

Columbia University (PhD)

Probabilistic Models, Convex Optimization, Causal Inference I (Fundamentals) and II (Advanced Topics), Computational Learning Theory

Princeton University (BSE)

Graduate-level: Advanced Computer Vision, Reinforcement Learning, Theoretical Machine Learning, Theoretical Deep Learning, Advanced Algorithms

Undergraduate-level: Neural Networks, Machine Learning and Pattern Recognition, Operating Systems, Computer Networks

TEACHING AND SERVICE

TA for ‘Frontiers of Machine Learning’ at Columbia University, Prof. Carl Vondrick (Fall 2025). Seminar class covering frontier research areas in ML (AI agents, post-training, diffusion models, VLAs, etc.)

TA for ‘Neural Networks and Deep Learning’ at Columbia University, Prof. Richard Zemel (Spring 2025.) Graduate-level class covering fundamental principles and advanced topics in deep learning.

Reviewer for ICML 2026, ICLR 2025, CVPR 2022.

EXPERIENCE

Columbia University Sep 2021-Present

Graduate Research Assistant.

- Research interest in developing fundamental AI methods for scientific discovery applications.
- PhD work introduces novel learning-based methods for simulation and lab-in-the-loop experimentation.

Google

Jun 2019-Aug 2019

Software Engineering Intern.

- Search ads team; worked on making ads more responsive to long-horizon user tasks (e.g. vacation planning).
- Built pipelines to identify under-served user tasks and collaborated with several AI teams to improve ad serving.

SKILLS AND INTERESTS

Programming Languages: Python, Java, C++, Matlab, Bash, HTML/CSS

Software: PyTorch, Jax, Tensorflow, MuJoCo, Blender, Numpy, Scipy, Scikit-Learn, Matplotlib, Pandas

Music: Performing Carnatic (South Indian Classical Music) vocalist.