Alexander Gao

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Education

University of Maryland — College Park, MD
Ph.D. in Computer Science, Advisor: Dr. Ming C. Lin — 2021–Current

NYU Tandon School of Engineering — Brooklyn, NY
M.S. in Computer Science, GPA: 3.97/4.00 — 2018–2020

University of Southern California — Los Angeles, CA
B.A. in Cinematic Arts (Concentration: Film Production) — 2007–2011

Publications

[1] **A. Gao**, M. Chu, M. Kapadia, M. C. Lin, and H.-T. D. Liu, "An intrinsic vector heat network", *Submitted*, 2024.

[2] **A. Gao**, G. Lee, N. Williams, W. Chambers, Y.-L. Qiao, X. Wang, S. Xu, and M. C. Lin, "Event-driven lighting for immersive attention guidance", *Submitted*, 2023.

[3] **A. Gao**, Y.-L. Qiao, Y. Xu, Y. Feng, J.-B. Huang, and M. C. Lin, "Dynamic mesh-aware radiance fields", *International Conference on Computer Vision (ICCV)*, 2023.

[4] **A. Gao**, Y.-L. Qiao, and M. C. Lin, "Neuphysics: Editable neural geometry and physics from monocular videos", in *Conference on Neural Information Processing Systems (NeurIPS)*, 2022.

[5] W. Han, H. Wu, E. Hirota, **A. Gao**, L. Pinto, L. Righetti, and C. Feng, "Learning simultaneous navigation and construction in grid worlds", in *International Conference on Learning Representations (ICLR)*, 2023.

Research Experience

Roblox — San Mateo, CA
Research Intern — Summer 2023

- Supervisors: Dr. Hsueh-Ti Derek Liu, Dr. Maurice Chu, Dr. Mubbasir Kapadia
- Learning Intrinsic Vector Fields on Surfaces for Field-Guided Quad Mesh Retopology.

GAMMA Lab, University of Maryland — College Park, MD
Research Assistant — Fall 2021–Current

- Supervisor: Dr. Ming C. Lin
- Differentiable simulation and rendering, with applications in robotics and animation.

Google — Mountain View, CA
PhD Software Engineering Intern — Fall 2022

- Supervisor: Dr. Peter Kimball
- Leveraging sun angle to improve offline device localization accuracy for location-based Augmented Reality.

Generalizable Robotics and AI Lab (GRAIL), New York University — New York, NY
Research Assistant — Fall 2020

- Supervisor: Dr. Lerrel Pinto

- Evaluated reinforcement learning algorithms on POMDP robotic additive manufacturing tasks.
- Studied learning-based methods for planning and control of articulated humanoids in simulation.

Future Reality Lab, New York University — New York, NY
Research Assistant — Spring 2019

- Supervisor: Dr. Ken Perlin
- Designed and built prototype for Mixed Reality Classroom, a multiuser, multimodal AR education platform.
- Presented live demonstration in June 2019 at the Verizon 5G EdTech Summit.

Additional Industry Experience

Amazon Web Services (AWS) — Arlington, VA
Software Engineer — Feb. 2021–Aug. 2022

- Supervisor: Dr. Sandipan Kundu
- Built simulation application to generate large-scale synthetic image data to train computer vision models.
- Analyzed image feature embeddings to quantify distance between real and synthetic image data.
- Applied differentiable rendering methods to reconstruct 3D object geometry from images.

Amazon Web Services (AWS) — Remote
Software Engineering Intern — Summer 2020

- Designed and implemented well-tested cryptographic time-stamping service for digital signing service.

AI Foundation — San Francisco, CA
Software Engineering Intern — Summer 2019

- Developed computer vision algorithm to generate facial textures for realistic 3D human avatars.

Mosaic — Los Angeles, CA
Motion Graphics Designer — Aug. 2016 - Aug. 2018

- Modeled, animated, and rendered motion graphics for film and advertising.

Academic Service

- Reviewer, SIGGRAPH 2024
- Reviewer, ICML 2024
- Reviewer, IEEE Robotics and Automation Letters (RA-L) 2024
- Reviewer, ICLR 2024
- Reviewer, NeurIPS 2023

Skills

- **Programming Languages:** C++, Python, Java, C#, MATLAB
- **Mathematics:** Probability, Multivariable Calculus, Linear Algebra, Differential Equations, Geometry
- **Data Science / Machine Learning:** PyTorch, Tensorflow, Scikit-Learn, NumPy, Pandas
- **Computer Graphics:** OpenGL, Blender, Unreal Engine, Unity, Cinema 4D, ARCore, ARKit, OpenCV
- **Creative Software:** Adobe After Effects, Premiere, Photoshop, Illustrator

Scholarships and Awards

- Dean's Fellowship (University of Maryland) 2021–2023
- Graduate School of Engineering Scholarship (New York University) 2018–2020
- Presidential Scholarship (University of Southern California) 2007–2011
- National Merit Scholar (NMSC) 2007
- 1st Place, Pathfinder Award (AWS Robotics Hackathon) 2022

Talks

- **UMD Graphics & Vision Seminar**, University of Maryland, College Park October 2023
  On Dynamic Mesh-Aware Radiance Fields
- **AI Reading Group**, Roblox Core AI July 2023
  Bridging Neural Fields with Classical Geometric Algorithms

Teaching

- **Teaching Assistant** at University of Maryland Fall 2023
  Object-Oriented Programming (CMSC131)
- **Teaching Assistant** at University of Maryland Spring 2023
  Object-Oriented Programming II (CMSC132)
- **Teaching Assistant** at University of Maryland Fall 2021
  Introduction to Data Science (CMSC320)
- **Teaching Assistant** at New York University Fall 2019, Spring 2020
  Programming for Big Data Analytics (CS6513)
- **Section Leader** at Stanford University Spring 2020
  Code In Place (CS106A)