Arman Maesumi

arman_maesumi@brown.edu • armanmaesumi.github.io • https://github.com/ArmanMaesumi

Geometry ⇄ Learning. My research considers the interplay of geometry and deep learning as a *two-way* street:

Learning for geometry: I am actively developing robust and efficient neural methods for large-scale, in-the-wild 3D data, with the goal of extending the deep learning revolution to the 3D world.

Geometry for learning: Viewing feature spaces through a geometric lens has enabled emergent capabilities in my research; e.g., by enabling models to smoothly interpolate data in the absence of in-between observations.

As the boundaries between modalities blur, I aim to apply geometric principles to large foundation models broadly, facilitating more robust training, personalization, and interpretability by exploiting feature/weight-space geometry.

Education

PhD, Computer Science — Sept 2021 – May 2026 (expected)
Brown University — GPA: 4.00
Advisor: Daniel Ritchie

BS, Computer Science — Aug 2018 – Aug 2021
University of Texas at Austin
Advisor: Chandrajit Bajaj

Experience

Adobe Research — May 2023 – Dec 2023
Research Scientist Intern, *Mentors: Noam Aigerman, Thibault Groueix, Vova Kim* — San Francisco, CA
Published PoissonNet, a neural network architecture for learning on surfaces, applied to rig-free animation.

Adobe Research — May 2022 – Dec 2022
Research Scientist Intern, *Mentors: Sören Pirk, Matt Fisher, Vova Kim* — Remote
Published diffusion model that interpolates between disjoint data modes, applied to procedural noise patterns.

Brown University — Sept 2021 – Present
Research Assistant, *Advisor: Prof. Daniel Ritchie* — Providence, RI

University of Text at Austin · Computational Visualization Center — Aug 2020 – Dec 2020
Undergraduate Researcher, *Advisor: Prof. Chandrajit Bajaj* — Austin, TX
Synthesized wearable textures that robustly cloak humans from object detectors using adversarial ML.

University of Text at Austin · Dept. of Computer Science — May 2019 – June 2020
Undergraduate Researcher, *Advisor: Prof. Chandrajit Bajaj* — Austin, TX
Trained neural network to evaluate chess positions. Created largest public dataset of labeled chess positions.

University of Text at San Antonio · Dept. of Mathematics — Aug 2017 – May 2018
Undergraduate Researcher, *Advisor: Prof. Cody Patterson* — San Antonio, TX
Derived the probability density function and moments of the area of stochastically generated geometry.

Publications

PoissonNet: A Local-Global Approach for Learning on Surfaces
Arman Maesumi, Tanish Makadia, Thibault Groueix, Vladimir G. Kim, Daniel Ritchie, Noam Aigerman
ACM Transactions on Graphics (Proceedings of SIGGRAPH Asia) 2025

One Noise to Rule Them All: Learning a Unified Model of Spatially-Varying Noise Patterns
Arman Maesumi, Dylan Hu, Krishi Saripalli, Vladimir G. Kim, Matthew Fisher, Sören Pirk, Daniel Ritchie
ACM Transactions on Graphics (Proceedings of SIGGRAPH) 2024

Explorable Mesh Deformation Subspaces from Unstructured 3D Generative Models
Arman Maesumi, Paul Guerrero, Vladimir G. Kim, Matthew Fisher, Siddhartha Chaudhuri, Noam Aigerman, Daniel Ritchie
SIGGRAPH Asia 2023

Triangle Inscribed-Triangle Picking
Arman Maesumi
The College Mathematics Journal, 50:5, 364-371, 2019

Awards

NSF Graduate Research Fellowship (GRFP) 2022
MD5 Hackathon: 1st Place Entry, *Awarded $15,000 from Department of Defense* 2017

Software

Panopti: Interactive 3D Visualization in Python *pip install panopti*
A programmable, interactive 3D framework that supports remote workflows (through SSH) and headless rendering. Rapidly debug your code, on the go!

Torch Mesh Ops: PyTorch CUDA extension for differential operators on meshes
CUDA kernels that accelerate construction of discrete differential operators on meshes, very useful e.g. when used in a training loop for geometric problems.

torchrbf: Radial Basis Function Interpolation in PyTorch *pip install torchrbf*
A PyTorch-based RBF Interpolator that supports auto-diff and is much faster than SciPy's CPU implementation.

Skills

Programming	Python, C++, CUDA, JavaScript, Go, Java
Topics	Generative modeling, geometry processing, neural networks, geometric deep learning
Frameworks	PyTorch, NumPy, PyTorch CUDA API, LaTeX, libigl, pybind11, Three.js, Flask, Socket.IO, React
Miscellaneous	Blender, Adobe Ps/Ai/Ae, Cinema 4D, Octane Render, ComfyUI, Linux

Service

Conference Reviewing

Eurographics	2025
SIGGRAPH Asia	2024, 2025
Transactions on Visualization and Computer Graphics	2024
International Conference on Computer Vision (ICCV)	2023

Departmental Service

Brown Visual Computing Seminar Co-organizer	2023 – Present
Brown PhD Admissions	2025
NSF Research Experiences for Undergraduates Program (REU) mentor	2024, 2025

Mentorship

Aruna Anderson	Visiting Undergraduate (NSF REU), 2025
Nicole Ge	Visiting Undergraduate (NSF REU), 2025
Krishi Saripalli	Brown CS Undergraduate, 2024

Personal

3D Art Portfolio
https://www.behance.net/armanmaesumi

HumanBenchmark Verbal Memory
735pts (*top 0.1–0.5% global*)

Rubik's Cube Personal Record
11.25 seconds