

# Daksh K. Shah

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## EDUCATION

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### New York University, Courant Institute

*Master of Science in Computer Science*

New York, NY

Aug. 2026 – May 2028

### University of California, Santa Cruz

*Bachelor of Science in Computer Science & Math Theory and Computation*

Santa Cruz, CA

Sep. 2022 – June 2026

- **GPA:** 3.90
- **Honors/Awards:** Chancellor's Award, Deans' List (8x)
- **Thesis:** *K-Material SDFs for Neural Attenuation Fields* – Winner of 2026 Chancellor's Award
- **Selected Coursework:** Computer Graphics, Deep Learning, Numerical Methods, Real Analysis, Advanced Linear Algebra, Database Systems I, Distributed Systems, Algorithm Analysis
- **Graduate Coursework:** Advanced Computer Vision, Statistical Machine Learning, Artificial Intelligence, Advanced ML (NeuroSymbolic AI, Differentiable Programming), Applied Bayesian Statistics

## PUBLICATIONS

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### Peer-Reviewed, Preprints & Technical Reports

**Slug Mobile: Test-Bench for RL Testing** — Jonathan Wellington Morris, Vishrut Shah, Alex Besanceny, Daksh Shah, Leilani H. Gilpin — arXiv:2409.10532 (2024)

**Video Super-Resolution Benchmark: Evaluating Spatial Fidelity and Temporal Coherence Tradeoffs** — Daksh K. Shah, Dylan J. Louie — Technical Report, UC Santa Cruz (2025)

### Under Review & In Preparation

**ReNAF: Regularized Neural Attenuation Fields with 3D Reconstruction Priors for Sparse-View CT** — Emmanouil Nikolakakis, Daksh K. Shah, Julia Wong, Julie Digne, Razvan Marinescu — Under Review at MICCAI (2026)

**K-Material SDFs for Neural Attenuation Fields in Sparse-View CT** — Daksh K. Shah, Emmanouil Nikolakakis, Razvan Marinescu — Targeting Submission for Off-Grid Workshop, MICCAI (2026)

## RESEARCH EXPERIENCE

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### Research Assistant (PI: Razvan Marinescu)

*BiomedAI Lab, UC Santa Cruz*

January 2024 – Present

*Santa Cruz, CA*

- Formulated **K-Material SDFs** for Neural Attenuation Fields to enable automated multi-surface reconstruction for Sparse-View CBCT.
- Developed a differentiable **Soft Selector** and GMM-based priors to eliminate manual hyperparameter tuning in tissue modeling.
- Evaluated **NeAS** and **ReNAF** architectures on **Kubernetes**, analyzing the impact of physics-informed regularization on high-frequency reconstruction fidelity.

### Research Assistant (PI: James Davis)

*VIS Lab, UC Santa Cruz*

April 2025 – Present

*Santa Cruz, CA*

- Developing an egocentric **Gaussian Splatting** pipeline optimized for rapid viewpoint changes and dynamic illumination in AR for Meta Project Aria.
- Lead for reading group on **Embodied Navigation, Vision-Language Models, and 3D Reconstruction**
- Developing a hybrid 3D foundation model combining Masked Autoencoders and Signed Distance Fields for zero-shot, feed-forward sparse-view point cloud denoising.

## PROFESSIONAL EXPERIENCE

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### Software Engineer Intern

*Keysight Technologies*

Jan. 2026 – June 2026

- Migrating legacy WPF plugin interfaces to the KS8500B web app using **C#/.NET** and **Avalonia** to enable cross-platform UI rendering.
- Implementing high-fidelity data visualization to ensure UI parity between desktop and browser-based test automation tools.

## LEADERSHIP, TEACHING, & SERVICE

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### Teaching Assistant & Tutor

April 2023 – Present

*Baskin School of Engineering, UC Santa Cruz*

*Santa Cruz, CA*

- Supported 7+ rigorous academic courses including Graduate Statistical ML, Computer Graphics, and Advanced Data Structures.
- Engineered automated Piazza mirroring and built student resource sites for **Computer Graphics (CSE 160)**, earning the title "**Best Tutor**" from students in Winter 2025 and 2026.

### Instructional Officer

Aug. 2025 – Present

*Santa Cruz Artificial Intelligence*

*Santa Cruz, CA*

- Delivered technical workshops on **Neural Network architectures**, training workflows, and practical implementation for 50+ participants.

### Team Lead

Oct. 2022 – Dec. 2024

*Slugbotics, UC Santa Cruz*

*Santa Cruz, CA*

- Directed a 30-member engineering team using Agile methodologies to develop **Slugmobile**, an autonomous research vehicle with LiDAR and real-time perception.
- Delivered 3 large-scale milestones 2 weeks ahead of schedule, increasing overall team productivity by 25%.

## PROJECTS & INDEPENDENT WORK

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### Distributed Sharded Key-Value Store | *Go, Docker*

March 2025

- Engineered a horizontally scalable, sharded key-value storage system in **Go** using custom **RPCs**, implementing **Causal and Eventual Consistency** for distributed synchronization.
- Architected a **fault-tolerant**, partition-resilient cluster deployed via **Docker** for containerized orchestration and automated health monitoring.

### Video Super-Resolution (VSR) Generative Benchmark | *PyTorch*

April 2025 – June 2025

- Benchmarked **GAN** and **Diffusion**-based architectures (StableVSR, ESRGAN, Real-ESRGAN) on the **REDS** dataset for 4x spatial upscaling.
- Evaluated the trade-off between spatial fidelity and temporal coherence using **LPIPS**, **DISTS**, and **Temporal LPIPS** metrics.
- Analyzed the impact of **temporal conditioning** and noise modeling on reducing flickering artifacts and improving frame-to-frame stability.

### Motion Gesture Sign Language Translator | *PyTorch, Kubernetes, MLFlow*

- Developing an end-to-end MLOps pipeline for Sign Language motion gesture recognition by fine-tuning **VideoMAE** on the ASL Citizen dataset.
- Utilizing **PyTorch Lightning** and Huggingface Transformers for distributed model training.
- Leveraging **Kubernetes** and **Kubeflow** for scalable distributed training, and integrating **MLFlow** for systematic experiment tracking and model management.

### Graphics Engine & Shading Pipeline | *WebGL*

- Developed a custom graphics engine with an optimized rendering pipeline using **OpenGL/WebGL**.
- Implemented advanced shading techniques and real-time 3D rendering for interactive applications, demonstrating strong foundational knowledge of low-level graphics APIs.

## TECHNICAL SKILLS

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**ML & 3D Vision:** 3D Gaussian Splatting, Neural Radiance Fields (NeRFs), Diffusion Models, Vision-Language Models, Pose Estimation, LoRA, Self-supervised Learning

**Languages:** Python, C/C++, C#, Go, TypeScript/JavaScript, SQL, Bash

**Vision & Libraries:** PyTorch, ONNX, OpenCV, Three.js, WebGL, OpenGL, LlamaIndex

**MLOps & Systems:** Docker, Kubernetes, WandB, Kubeflow, MLflow, Distributed Systems

**Software Eng.:** .NET, Avalonia, WPF, Next/React, RESTful APIs, PostgreSQL, Spring Boot