Daksh K. Shah

3D Reconstruction | Sparse-View Imaging | Neural Rendering | Egocentric Vision

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Employment History

Jan 2026 – June 2026	**Software Engineer Intern** Keysight Technologies
April 2025 – Present	**Research Assistant** BiomedAI Lab — Baskin School of Engineering, UC Santa Cruz; **PI: Razvan Marinescu**
January 2024 – Present	**Research Assistant** Visualization and Interactive Systems (VIS) Lab — Baskin School of Engineering, UC Santa Cruz; **PI: James Davis**
January 2024 – December 2024	**Research Assistant** AIEA Lab — Baskin School of Engineering, UC Santa Cruz; **PI: Leilani Gilpin**
April 2023 – June 2026	**Teaching Assistant** Baskin School of Engineering, UC Santa Cruz

Education

2022 – 2026 **B.S., UC Santa Cruz** Computer Science & Math Theory and Computation
Thesis title: *K-Material SDFs for Neural Attenuation Fields*
Honors: Deans' List (Fall {2022, 2023, 2025}, Winter {2022, 2026}, Spring {2023, 2024, 2025})
Graduate Coursework: Advanced Computer Vision, Statistical Machine Learning, Advanced ML {NeuroSymbolic AI, Differentiable Programming}, Applied Bayesian Statistics

Research Publications

Conference Proceedings

1. E. Nikolakakis, D. K. Shah, J. Wong, J. Digne, and R. Marinescu, "Renaf: Regularized neural attenuation fields with 3d reconstruction priors for sparse-view ct," Under Review at MICCAI, 2026.

Theses

1. D. K. Shah, "K-material SDFs for neural attenuation fields," Bachelor's thesis, University of California, Santa Cruz, 2026.

Technical Reports and Posters

1. D. K. Shah and D. J. Louie, *Video super-resolution benchmark: Evaluating spatial fidelity and temporal coherence tradeoffs*, 2025.
2. J. W. Morris, V. Shah, A. Besanceney, D. Shah, and L. H. Gilpin, *Slug mobile: Test-bench for rl testing*, 2024. arXiv: 2409.10532 [cs.RO]. URL: https://arxiv.org/abs/2409.10532.

Work-in-Progress

1. D. K. Shah and J. Davis, "Coverage-aware frame selection: Mitigating attentional bias in egocentric 3d reconstruction via motion statistics," In Preparation for ICCV 2027.
2. D. K. Shah, E. Nikolakakis, and R. Marinescu, "K-material SDFs for neural attenuation fields in sparse-view CT," Targeting Submission for SASHIMI 2026.

Selected Research and Projects

June 2025 – Present
Volumetric Reconstruction for Sparse-View CBCT

- Formulated **K-Material SDFs** for Neural Attenuation Fields to enable automated multi-surface reconstruction.
- 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.

April 2025 – Present
Egocentric Scene Reconstruction – Meta Project Aria

- Developing an egocentric **Gaussian Splatting** pipeline optimized for rapid viewpoint changes and dynamic illumination in AR.
- Implementing robust **pose estimation** and **scene graph** architectures to encode hierarchical spatial-semantic relationships for navigation.

April 2025 – June 2025
Video Super-Resolution (VSR) Generative Benchmark

- 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.

March 2025
Distributed Sharded Key-Value Store

- Engineered a horizontally scalable, sharded key-value storage system in **Go** utilizing a custom **RPC** framework.
- Implemented **Causal and Eventual Consistency** models to manage data synchronization across distributed nodes.
- Designed a **fault-tolerant** architecture with partition-resilience, leveraging **Docker** for containerized cluster orchestration and health monitoring.

Teaching & Service

2025 – 2026
Instructional Officer, Santa Cruz Artificial Intelligence
Delivered technical workshops on **Neural Network architectures**, training workflows, and practical implementation for 50+ participants.

2023 – 2026
Teaching Assistant, Baskin School of Engineering
Computer Graphics (4x), Computer Vision, Probability and Statistics, Data Structures and Algorithms, and RISC-V Assembly (3x).

References

Prof. Razvan Marinescu
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Prof. James Davis
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