Avinash Paliwal

San Jose, CA
✉ avinashpaliwal@tamu.edu
avinashpaliwal.com
Website Scholar GitHub LinkedIn

Research Summary

AI Researcher and Engineer specializing in **3D Computer Vision** and **Generative Video Models**. Experienced in diffusion models and 3D Gaussian Splatting for view synthesis and 3D reconstruction/generation, with top-tier publications at CVPR, ICCV, ECCV, and SIGGRAPH Asia. **Proven ability to translate research into production**, with experience shipping features at **Morphic** and conducting cutting-edge research at **Meta Reality Labs**. Interested in controllable generative AI and world models.

Education

2019–2025 **Texas A&M University**, *College Station, TX*.
Doctor of Philosophy in Computer Engineering
Advised by Dr. Nima Kalantari

2018–2019 **Texas A&M University**, *College Station, TX*.
Master of Science in Computer Engineering
Advised by Dr. Nima Kalantari

2012–2016 **Visvesvaraya National Institute of Technology**, *Nagpur, India*.
Bachelor of Technology in Electronics and Communication Engineering

Industry & Research Experience

2025 – Present **ML Team, Morphic Inc.**, Founding AI Researcher, *San Jose, CA*.
- Led development of production **video generation** features, including **3D Motion** for custom camera videos from a single image (blog, demo) and **video inpainting/outpainting** (blog, demo).
- Building a feature based on **Reshoot-Anything** (*under review*): a self-supervised **video-to-video camera control** model trained on **arbitrary monocular videos** without 3D annotations or static-dynamic scene filtering.
- Trained large video models using **multi-node distributed** training with a range of fine-tuning strategies (such as full fine-tuning, LoRA, context adapters), enabling faster experimentation and improved controllability.
- Built **parallelized data pipelines** for video curation, filtering, and preprocessing to support robust training.
- Exploring **agentic text-to-trajectory** planning with **LLMs/MLLMs** to generate scene-aware complex camera paths from text prompts, with optional human-in-the-loop refinement via text/3D edits.

Spring 2024 **Reality Labs, Meta**, Student Researcher, *Remote*.
- Improved **360° sparse-view novel view synthesis** (3–9 views) by integrating diffusion-based repair/inpainting priors into **3D Gaussian Splatting** optimization (ICCV 2025).

Fall 2023 **Reality Labs, Meta**, Research Scientist Intern, *Sunnyvale, CA*.
- Developed a real-time sparse novel view synthesis system using **coherent 3D Gaussian Splatting** to improve geometry consistency and reconstruction quality (ECCV 2024).

Fall 2021 **Computer Vision Team, Leia Inc.**, Research Intern, *Remote*.
- Developed a near real-time stereo **view-time interpolation** method for handheld 3D displays using multi-plane disparities and non-uniform coordinates (CVPR 2023).

2019 – 2025 **Texas A&M University**, Graduate Research Assistant (Ph.D.), *College Station, TX*.
- Developed a single-image **360° 3D scene generation** process via diffusion-based panorama/depth synthesis followed by fast **3D Gaussian Splatting** optimization (SIGGRAPH Asia 2025).
- Proposed a modular **pixel reshading** network that predicts view-dependent shading (e.g., moving specular highlights) for novel views, improving single-image novel view synthesis realism (SIGGRAPH Asia 2023).
- Published additional work on dynamic scene interpolation (WACV 2023), GAN-based raw video denoising (ICCP 2021), and hybrid-imaging slow motion reconstruction system (TPAMI 2020).

Summer 2019 **Devices Organization, Amazon**, Software Development Engineer Intern, *Seattle, WA*.
- Built a Java/SQL pipeline to analyze customer interaction history and power personalized recommendations to improve user engagement.

2016 – 2018 **Embedded Software Team, R&D, Bajaj Auto Ltd.**, Senior Engineer, *Pune, India*.
- Developed core modules for **BALOS** (first in-house RTOS), including OTA bootloader, fault management, and a lightweight CAN protocol reducing bandwidth by **40%**.
- Built an emulation and debugging environment to run the application + RTOS stack without hardware, enabling faster root-cause analysis and development iteration.

Publications

9 publications (7 top-tier venues) and **2 manuscripts under review**. Full list: avinashpaliwal.com

Under Review 2025 — **Reshoot-Anything: A Self-Supervised Model for In-the-Wild Video Reshooting**.
Avinash Paliwal, Adithya Iyer, Shivin Yadav, Muhammad Ali Afridi, Midhun Harikumar

SIGGRAPH Asia 2025 — **PanoDreamer: Optimization-Based Single Image to 360 3D Scene With Diffusion**, [Website].
Avinash Paliwal, Xilong Zhou, Andrii Tsarov, Nima Kalantari

ICCV 2025 — **RI3D: Few-Shot Gaussian Splatting With Repair and Inpainting Diffusion Priors**, [Website].
Avinash Paliwal, Xilong Zhou, Wei Ye, Jinhui Xiong, Rakesh Ranjan, Nima Kalantari

ECCV 2024 — **CoherentGS: Sparse Novel View Synthesis with Coherent 3D Gaussians**, [Website].
Avinash Paliwal, Wei Ye, Jinhui Xiong, Dmytro Kotovenko, Rakesh Ranjan, Vikas Chandra, Nima Kalantari

SIGGRAPH Asia 2023 — **ReShader: View-Dependent Highlights for Single Image View-Synthesis**, [Website].
Avinash Paliwal, Brandon G. Nguyen, Andrii Tsarov, Nima Kalantari

CVPR 2023 — **Implicit View-Time Interpolation of Stereo Videos using Multi-Plane Disparities and Non-Uniform Coordinates**, [Website].
Avinash Paliwal, Andrii Tsarov, Nima Kalantari

WACV 2023 — **Frame Interpolation for Dynamic Scenes with Implicit Flow Encoding**, [Website].
Pedro Figueirêdo, **Avinash Paliwal**, Nima Kalantari

ICCP 2021 — **Multi-Stage Raw Video Denoising with Adversarial Loss and Gradient Mask**, [Website].
Avinash Paliwal, Libing Zeng, Nima Kalantari

TPAMI 2020 — **Deep Slow Motion Video Reconstruction with Hybrid Imaging System**, [Website].
Avinash Paliwal, Nima Kalantari

Additional: WaSt-3D (ECCV 2024), ProSty (Under Review).

Awards & Academic Service

2025 — **Outstanding Reviewer Award**, CVPR.

2020–2024 — TAMU CSE travel grants for ECCV 2024, CVPR 2023, ICCP 2020 ($1,000 each).

2020–2026 — Reviewer: CVPR, ICCV, ECCV, NeurIPS, SIGGRAPH Asia, WACV; Journals: TOG, TVCG, JSYST.

Talks

2024 — **Invited Talk**, *Fast and Photorealistic Novel View Synthesis from Sparse Images*, Voxel51.

Teaching & Mentoring

Teaching — TA for Computer Graphics (CSCE 441) and Computational Photography (CSCE 489/689).

Mentoring — Mentored Ph.D. and M.S. students on 3DGS and video restoration; led to multiple co-authored papers.

Ph.D. students

2021 – 2022 — Pedro Figueirêdo

2019 – 2020 — Libing Zeng

M.S. students

2024 – 2025 — Meetansh Gupta

2024 – 2025 — Geetesh Challur

2023 – 2024 — Brandon Nguyen

Skills

ML / GenAI — PyTorch, TensorFlow, Diffusion, 3D & Video Generation, LoRA, Full fine-tuning, Adapters, LLMs/MLLMs

3D / Vision — 3DGS, NeRF, Sparse-view Novel View Synthesis, 360° Reconstruction, Computational Photography

Systems — Multi-node Distributed Training, Video Data Curation & Preprocessing Pipelines

Programming — Python, C++, CUDA (basic), Embedded C, MATLAB, LaTeX