Sunil Kumar Narayanan

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↪ My Webpage
 Github   in Linkedin

Education

2023–2024   **Master of Science in Computer Science**, *Georgia Institute of Technology*.
Advisor: Dr. Lu Gan
GPA: 4.0/4.0

2017–2021   **Bachelor of Technology in Software Engineering**, *SRM Institute of Science and Technology*.
GPA: 80.2%

Publications

2026   Sunil Kumar Narayanan, Lingjun Zhao, Lu Gan, and Yongsheng Chen. Diffusion-denoised hyperspectral gaussian splatting. In *Proceedings of the International Conference on 3D Vision (3DV)*, 2026. To appear, Also available as arXiv:2505.21890.

2025   Gerry Chen, Sunil Kumar Narayanan, Thomas Gautier Ottou, Benjamin Missaoui, Harsh Muriki, Cédric Pradalier, and Yongsheng Chen. Hyperspectral neural radiance fields. In *CVPR Workshop on Neural Fields Beyond Conventional Cameras*, 2025. Spotlight Presentation. Also available as arXiv:2403.14839.

Research & Professional Experience

Aug 2023 – Present   **Research Assistant**, *Georgia Institute of Technology*, Atlanta, GA.
- Co-developed a novel Hyper-spectral 3D Reconstruction method **HS-NeRF** leveraging Neural Radiance Fields (NeRFs) with wavelength-conditioned rendering, achieving **500% higher spectral accuracy** for non-RGB novel view synthesis tasks. Enabled novel use cases in biology and recycling with enhanced wavelength-specific visualization; **Accepted to CVPR 2025: Neural Fields Beyond Conventional Cameras Workshop for a spotlight presentation.**
- Developed **DD-HGS**, a framework combining 3D Gaussian Splatting with diffusion modeling to mitigate sensor noise, achieving a 20 dB gain in PSNR and a 200% increase in rendering speed; **accepted to 3DV 2026**.
- Developed synthetic data generation pipelines using neural feature-map conditioned ControlNets for controllable adverse-weather simulation (e.g., rain, fog), enhancing spatial and semantic consistency across diverse training datasets for robust perception models
- Developed a LiDAR-based digital twin covering 20 km of the Atlanta Beltline using 3D reconstruction and semantic understanding techniques, enabling scalable simulation and analysis for urban planning and autonomous vehicle navigation

Jun 2024 – Aug 2024   **AI Research Intern**, *Shein AI*, Palo Alto, CA.
- Worked on 3D Virtual Try-on for the Shein Studio platform.
- Designed a multi-stage filtering system to detect excessively retouched product images using smoothness detection and geometric consistency checks.
- Enhanced low-quality image detection accuracy by 25% and reduced manual review overhead; system is currently **under review for a US Patent**.

Aug 2022 – Feb 2023   **Senior Research Scientist**, *Fastcode AI*, Bengaluru, India.
- Led a 500-person annotation team to build the first large-scale Indic fashion dataset; designed an entropy-based quality control framework that improved label consistency by 90%.
- Designed object detection and tracking models optimized for UAV-based autonomous drones, achieving 25% faster inference and 20% higher accuracy.

Sep 2021 – Aug 2022	***Computer Vision Engineer***, *VisionBox.ai*, Remote. ○ Developed deep learning models for disease and insect detection in agricultural drone imagery, improving field-level diagnostics. ○ Built analytics tools from sports video footage to extract game-specific features and player metrics. ○ Implemented image stitching and retrieval pipelines to extract spatial insights from high-resolution aerial datasets.
Jul 2021 – Dec 2021	***Computer Vision Intern***, *Sony Research India*, Bengaluru, India. ○ Researched and developed a novel cross-modal attention mechanism to model the interplay between vision, audio, and text features. ○ The resulting model surpassed state-of-the-art benchmarks and was successfully integrated into internal Sony platforms.

Fellowships & Awards

2020	Awarded **Bronze Medal** in the ***SIIC Melanoma Detection Challenge*** (Kaggle Competition) for achieving an F1 score of 0.938 in skin lesion classification.

Skills

Technical Skills	Python, C++, Bash, PyTorch, TensorFlow, Hugging Face, Diffusers, OpenCV, 3D Gaussian Splatting, NeRF, PyTorch3D, COLMAP, ControlNet, Object Detection, Segmentation, Multimodal Learning, Docker, Git, GCP, Linux, LaTeX

Peer Review

2025, 2026	**Reviewer**, International Conference on 3D Vision (3DV)

Teaching Assistantship

Aug 2023 – Dec 2024	**Teaching Assistant, OMSCS Academic Integrity**, *Georgia Institute of Technology*, Atlanta, GA.