Nithin Gopalakrishnan Nair

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Social Networks:

Research Interests

I work on problems in Computer Vision. My research focus is on developing scalable computer vision algorithms. My research experience and interests are on generative models for video and image, Multimodal LLMs, Image foundation models and 3D perception.

Education

Johns Hopkins University — **Baltimore, USA**
Ph.D. in Electrical and Computer Engineering — *2021 - Present*
Advisor: Dr Vishal. M. Patel

Indian Institute of technology, Madras, — **Chennai, India**
B.Tech and M.tech dual degree program, Electrical Engineering — *2015 - 2020*
CGPA: 9.0/10.0

Research Experience

Research Engineer- Apple — *June 2025-Present*
Working on multi agent systems for human interaction understanding

Research Experience

Google - Project Starline — *Dec 2024- March 2025*
Training a transformer-based large 3D reconstruction model to synthesize novel views for scenes.
Research on adapting a scaling up 3D synthesis using synthetic data.
Paper accepted at ICCV 2025
Hosts: Jungyeon Park, Srinivas Kaza

Nvidia Research — *April-Dec 2024*
Research on 3D perception using vision Foundations models and Multimodal LLMs
Mentors: J.P. Lewis, Ming-Yu Liu

Adobe Inc — *May-Aug 2023*
Research on Diffusion-based Image Editing
Developed a training-free pipeline for interactive Image Editing
Mentor: Yuqian Zhou

Mitsubishi Electric Research Labs — *May-Aug 2022*
Research on Energy-based Conditional Generation
Developed a generalized framework for Plug & Play generation using unconditional diffusion models
Mentors: Tim Marks, Anoop Cherian

Publications

- **Nithin Gopalakrishnan Nair***, Amandeep Kumar*, Vishal M Patel, Scale-Wise VAR is Secretly Discrete Diffusion, *Under Review*, (**2025**)
- **Nithin Gopalakrishnan Nair**, Srinivas Kaza, Xuan Luo, Jungyeon Park, Stephan Lombardi, Vishal M Patel, Scaling Transformer-based Novel View Synthesis Models with Token Disentanglement and Synthetic Data, *Proceedings of the IEEE international conference on computer vision*, (**ICCV 2025**)

- **Nithin Gopalakrishnan Nair**, Fangyin Wei, Tsung-Yi Lin, Zekun Hao, Xian Liu, Ming-Yu Liu, Vishal M Patel, JP Lewis, SmartTagger: Part Segmentation & Physical Property Assignment for 3D Assets, *Under review*, **2024**
- Sudarshan Rajagopalan, **Nithin Gopalakrishnan Nair**, Jay Paranjape, Vishal M Patel, GenDeg: Diffusion-Based Degradation Synthesis for Generalizable All-in-One Image Restoration, *Proceedings of the IEEE conference on computer vision and pattern recognition*,(**CVPR 2025**)
- **Nithin Gopalakrishnan Nair**, Jeya Maria Jose Valanarasu, Vishal M Patel, Max Fusion: Plug&Play Multi-Modal Generation in Text-to-Image Diffusion Models., *European Conference on Computer Vision*, (**ECCV 2024**)
- Yasiru Ranasinghe, **Nithin Gopalakrishnan Nair**, Wele Gedara Chaminda Bandara, Vishal M Patel, Diffuse-Denoise-Count: Accurate Crowd-Counting with Diffusion Models, *Proceedings of the IEEE conference on computer vision and pattern recognition*, (**CVPR 2024**)
- **Nithin Gopalakrishnan Nair**, Anoop Cherian, Suhas Lohit, Toshi Akino, Ye Wang, Vishal M Patel, Tim Marks, Steered Diffusion: A Generalized Framework for Plug-and-Play Conditional Image Synthesis, *Proceedings of the IEEE/CVF international conference on computer vision*, (**ICCV 2023**)
- **Nithin Gopalakrishnan Nair**, Wele Gedara Chaminda Bandara, Vishal Patel, Unite and Conquer: Cross Dataset Multimodal Synthesis using Diffusion Models, *Proceedings of the IEEE conference on computer vision and pattern recognition*, (**CVPR 2023**)
- Kartik Narayan,**Nithin Gopalakrishnan Nair**, Jennifer Xu, Rama Chellappa, Vishal M Patel, PETAL-face: Parameter Efficient Transfer Learning for Low-resolution Face Recognition (**WACV 2025 Oral-Top 5%)**
- **Nithin Gopalakrishnan Nair**, Kangfu Mei, Vishal Patel, Bi-Noising Diffusion: Towards Conditional Diffusion Models with Generative Restoration Priors, (**WACV 2025**)
- **Nithin Gopalakrishnan Nair**,Wele Gedara Chaminda Bandara,,Vishal Patel, DDPM-CD: Remote Sensing Change Detection using Denoising Diffusion Probabilistic Models, (**WACV 2025**)
- **Nithin Gopalakrishnan Nair**, Kangfu Mei, Vishal Patel, AT-DDPM: Restoring Faces degraded by Atmospheric Turbulence using Denoising Diffusion Probabilistic Models, *IEEE/CVF Winter Conference on Applications of Computer Vision* , (**WACV 2023**)
- **Nithin Gopalakrishnan Nair**, Vishal Patel, T2V-DDPM: Thermal to Visible Face Translation using Denoising Diffusion Probabilistic Models, *IEEE International Conference on Automatic Face & Gesture Recognition*, 2023
- **Nithin Gopalakrishnan Nair**, Kangfu Mei, Vishal Patel, A comparison of different atmospheric turbulence simulation methods for image restoration, *IEEE International Conference on Image Processing (ICIP)*, 2022
- Malsha Perera, **Nithin Gopalakrishnan Nair**, Wele Gedara Chaminda Bandara, Vishal Patel, SAR Despeckling using a Denoising Diffusion Probabilistic Model, *IEEE Geoscience and Remote Sensing Letters*,2023
- **Nithin Gopalakrishnan Nair**, Rajeev Yasarla, Vishal Patel, NBD-GAP: Non-Blind Image Deblurring Without Clean Target Images, *IEEE International Conference on Image Processing (ICIP)*, 2022
- **Nithin Gopalakrishnan Nair**, Rajeev Yasarla Vishal Patel, Confidence Guided Network For Atmospheric Turbulence Mitigation, *IEEE International Conference on Image Processing (ICIP)*, 2021
- Mahesh Mohan MR, **Nithin Gopalakrishnan Nair**, AN Rajagopalan, Deep Dynamic Scene Deblurring for Unconstrained Dual-Lens Cameras, *IEEE Transacations in Image Processing (TIP)* 2021
- Jay N Paranjape, **Nithin Gopalakrishnan Nair**, Shameema Sikder, S Swaroop Vedula, Vishal M Patel, Adaptivesam: Towards efficient tuning of sam for surgical scene segmentation, *MIUA 2023*
- **Nithin Gopalakrishnan Nair**, Kartik Narayan, Maitreya Suin, Ram Prabhakar, Jennifer Xu, Soraya Stevens, Nathan Shnidman, Rama Chellappa, Vishal M Patel, Improved Representation Learning for Unconstrained Face Recognition , *IEEE FG*, 2025

References

Dr. Ming-Yu Liu
Vice President of Research, NVIDIA
Email: mingyul@nvidia.com

Dr. Soraya Stevens
Principal Software Engineer, STR
Email: soraya.stevens@str.us

Dr. Anoop Cherian
Principal Research Scientist, MERL
Email: cherian@merl.com

Dr. JP Lewis
Research Scientist, Nvidia Research
Email: jpl@nvidia.com

Portfolio of most relevant projects

BRIAR	IARPA's face recognition program. Built the world's best face recognizer
LIGO data analysis	UC Berkeley, Implemented an FIR band-pass filter using Remez exchange algorithm
EMISAT	India's surveillance satellite, Built a Down-sampler and FFT-based Signal Analyzer

Awards and Scholastic Achievements

- All India Rank 454 in IIT-JEE Advanced 2015 from 1.5 million candidates.
- State rank 4 in KEAM 2015 from over 200,000 candidates.
- Awarded certificate for being among the top 0.1% in AISSCE 2015 by Central Board of Secondary Education, India.
- Awarded Kishore Vaigyanik Protsahan Yojana Scholarship 2014, by the Government of India, given to top 1000 from 300,000 candidates to pursure study in Sciences.
- All India Topper in NPTEL Analog Electronic Systems, 2018.

Services

National Service Scheme 2015	Worked on Enriching Malayalam Wikipedia
National Service Scheme 2016	Worked on Suyam Project, aimed at preliminary education for students in rural villages in India
Invited Reviewer:	ICLR' 24, NIPS' 24, ECCV'24 CVPR' 24, NIPS' 23, ICCV'23 , CVPR' 23, PAMI, TMI, TIP