Shashikant **Verma**

Ph.D. Scholar · Computer Vision Imaging & Graphics Lab

Indian Institute of Technology (IIT) Gandhinagar, Gujarat, 382355, India

(+91) 6352826351 | shashikant.verma@iitgn.ac.in | shash29-dev.github.io | shash29-dev | shashikant-verma297 | Scholar

Research Interests

3D-aware generative modeling with a special focus on creating realistic and animatable virtual humans. I am also interested in motion understanding across human and non-human species.

Broad Areas Computer Vision | Computer Graphics | Deep Learning | Volumetric & Differentiable Rendering | Generative AI.

Education

PhD in Electrical Engineering

2020 - Present

IIT Gandhinagar — *Gujarat, India*

- Advised by: Prof. Shanmuganathan Raman
- Thesis Submitted : "Towards Realistic 3D Digital Humans and Multi-Species Motion Understanding" | CPI: 9.09/10

MTech in Electrical Engineering

2017 - 2019

IIT Gandhinagar — *Gujarat, India*

- Advised by: Prof. Shanmuganathan Raman
- Thesis Defended : "Fast Semantic Features Extraction using Superpixels for Image Segmentation" | CPI: 7.60/10

BTech in Electronics & Communication Engineering

2012 - 2016

SRMCEM Lucknow — *Uttar Pradesh, India*

- Advised by: Prof. Rahul Verma
- Thesis Defended : "Pitch Based Security System" | Percentage: 70.10 %

Higher Secondary Certificate, CBSE Board

2011 - 2012

Central Academy, Lucknow — *Uttar Pradesh, India*

Percentage: 75.80 %

Publications

PUBLISHED

- **Shashikant Verma**, and Shanmuganathan Raman. "SemFaceEdit: Semantic Face Editing on Generative Radiance Manifolds." In International Conference on Pattern Recognition 2025. **[ICPR]**
- Soumyaratna Debnath*, Harish Katti*, **Shashikant Verma**, and Shanmuganathan Raman. L3D-Pose: Lifting Pose for 3D Avatars from a Single Camera in the Wild," In IEEE International Conference on Acoustics, Speech and Signal Processing 2025. **[ICASSP]**
- **Shashikant Verma**, Aman Sharma, Roopa Sheshadri, and Shanmuganathan Raman. "GraphFill: Deep Image Inpainting using Graphs." In Proceedings of the IEEE/CVF Winter Conference on Applications of Computer Vision 2024. **[WACV]**
- **Shashikant Verma**, Subramanian Sankaranarayanan, and Shanmuganathan Raman. "POPs: Pluck Out the Petals." In International Conference on Signal Processing and Communications 2024. **[SPCOM]**
- **Shashikant Verma***, Aalok Gangopadhyay*, and Shanmuganathan Raman. "DMD-Net: deep mesh denoising network." In International Conference on Pattern Recognition 2022. **[ICPR]**
- **Shashikant Verma**, Rajendra Nagar, and Shanmuganathan Raman. "Fast semantic feature extraction using superpixels for soft segmentation." In International Conference on Computer Vision and Image Processing 2019. **[CVIP]**
- **Shashikant Verma**, and Shanmuganathan Raman; DARTs: Deformable Animation Ready Templates for Clothing Humans". To Appear at International Conference on Image Processing 2025. **[ICIP]**
- **Shashikant Verma**, Nicu Sebe, and Shanmuganathan Raman; GMOT-Mamba: Mamba Based Model Prediction for Generic Multiple Object Tracking". To Appear at the International Conference on Image Processing 2025. **[ICIP]**

UNDER REVIEW

- **Shashikant Verma**, Soumyaratna Debnath, Harish Katti, Yamuna Swamy, and Shanmuganathan Raman "STEP: Simultaneous Tracking and Estimation of Pose for Animals and Humans." arXiv preprint arXiv:2503.13344. Under Review at International Journal of Computer Vision 2025. **[IJCV]**
- **Shashikant Verma**, and Shanmuganathan Raman; PanoHair: Detailed Hair Strand Synthesis on Generative Volumetric Heads. Under review at British Machine Vision Conference (BMVC) 2025. **[BMVC]**

Experience

Visiting Research Scholar
Feb. 2024 - Aug. 2024

University Of Trento | Advisor: Prof. Nicu Sebe *Trento, Italy*

- Designed a Vision Mamba-based multi-object tracker that predicts weights dynamically to track up to 10 objects simultaneously in a single shot, reducing cumulative inference latency compared to traditional single-object tracking pipelines.
- Achieved 10% improvement in inference speed over transformer-based models, with 26% fewer parameters (37M vs. 50M), via a Vision Mamba-based tracking architecture.

Research Intern
July 2022 - Jan. 2023

Samsung Research Institute Bangalore (SRIB) | RM: Roopa Sheshadri *Bangalore, India*

- Developed GraphFill, a GNN-based coarser-to-finer image inpainting framework with a lightweight generative backbone. (WACV 2024)
- Real-time on-device inference for image inpainting on Samsung Galaxy S23 with a 4.5M parameter model, running at 105 ms inference and 13 ms loading time.
- Achieved a 20× reduction in model size (4.5M vs. 100M+ parameters) with only 6% FID drop, enabling efficient image inpainting comparable to state-of-the-art generative models, and deployable in real-time on mobile hardware.

Independent Researcher
Jan. 2023 - Apr. 2023

PMDCB Lab, IIT Gandhinagar | Advisor: Subramanian Sankaranarayanan *Gujarat, India*

- Proposed POPs, a generalized approach to automatically segment out individual petal instances for any flower species.
- Achieved 2% error in automatic petal count estimation across 20 diverse flower species (4 to 100+ petals), validating the method's accuracy and reliability against human ground truth. (SPCOM 2024)
- Developed an interactive FloraSeg tool, allowing manual supervision to rectifying inaccuracies, ensuring precise phenotyping of flowers.

Junior Research Fellow
Aug 2019 - Aug. 2020

CVIG Lab, IIT Gandhinagar | Advisor: Shanmuganathan Raman *Gujarat, India*

- Developed DMDNet, an end-to-end deep learning framework using Graph neural networks to denoise a 3D mesh. (ICPR 2022)
- Implemented 3D scanning configurations for large-scale scanning of three Dholavira Heritage Sites and two Temples of Dwarka of Archaeological importance. Established scanning setups at the museums of Lothal and Dholavira for 3D digitization of historical artifacts.
- Created an interactive web repository for scanned artifacts using Three.js and large-scale scanned heritage sites (each 300+ m^2) using Potree.

Technical Skills

Programming Languages	Python (Proficient), C++, C
Deep Learning Frameworks	Pytorch, Tensorflow
Graphics Tools & Scripting	Blender (Python), Autodesk Maya (Python), Unity Engine (C#)
Architecture & Models	Neural Radiance Fields (NeRF), Gaussian Splatting, GANs, Diffusion Models, GNNs, Vision Transformers (ViT)
Others	LiDAR Scanning, Cura (3D printing), Autodesk Inventor, Git, Latex

Relevant Coursework

Computer Vision & Graphics. Digital Image Processing, Artificial Intelligence, Pattern Recognition And Machine Learning, 3D Computer Vision, Computer Graphics, Medical Imaging Systems, Learning with Graphs, Advanced Signal Processing, Nature Inspired Computing.

Mathematics. Mathematical Foundations for Computer Vision & Graphics, Basic Algebra, Advanced Numerical Methods.

Professional Activities

Teaching Assistant

2017-2018	**Complex Analysis**, Instructor: Prof. Atul Dixit, Mathematics Department, IIT Gandhinagar
2018-2019	**Electrical Lab**, Instructor: Prof. S. Rajendran, Electrical Engineering, IIT Gandhinagar
2020-2022	**3D Computer Vision**, Instructor: Prof. Shanmuganathan Raman, CVIG Lab, IIT Gandhinagar
2022-2024	**Deep Learning**, Instructor: Prof. Shanmuganathan Raman, CVIG Lab, IIT Gandhinagar
2024-2025	**Matrix Methods**, Instructor: Prof. Shanmuganathan Raman, CVIG Lab, IIT Gandhinagar

Peer Review Service

From 2020	**Reviewed 20+ manuscripts**, IEEE TIP, ICASSP, ICPR, CVIP, ICVGIP, IJCNN.