Kartik Narayan

LinkedIn | Github | Google Scholar
https://kartik-3004.github.io/portfolio/

Email: kartiknarayan1@gmail.com
Mobile: +1 667 219 1138

Summary

I am a 2nd year Ph.D. student in the Computer Science Department at Johns Hopkins University. My research is primarily focused on computer vision and face analysis, with a particular emphasis on multimodal LLMs and video generation.

Education

Johns Hopkins University — Baltimore, MD
Ph.D. Computer Science, Advisor: Dr. Vishal M. Patel — *2023 - Present*

Indian Institute of Technology Jodhpur — Jodhpur, India
Bachelors in Computer Science and Engineering — *2019 - 2023*

Publications

1. **FaceXFormer: A Unified Transformer for Facial Analysis**
Kartik Narayan, *Vibashan VS*, *Rama Chellappa*, *Vishal M. Patel*
Proceedings of the IEEE/CVF International Conference on Computer Vision (ICCV 2025)

2. **SegFace: Face Segmentation of Long-Tail Classes**
Kartik Narayan, *Vibashan VS*, *Vishal M. Patel*
Association for the Advancement of Artificial Intelligence (AAAI 2025)

3. **DF-Platter: Multi-Face Heterogeneous Deepfake Dataset**
Kartik Narayan, *Harsh Agarwal*, *Kartik Thakral*, *Surbhi Mittal*, *Mayank Vatsa*, *Richa Singh*
Proceedings of the IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR 2023)

4. **FaceXBench: Evaluating Multimodal LLMs on Face Understanding**
Kartik Narayan, *Vibashan VS*, *Vishal M. Patel*
Under Review. [arXiv]

5. **PETALface: Parameter Efficient Transfer Learning for Low-resolution Face Recognition**
Kartik Narayan, *Nithin Gopalakrishnan Nair*, *Jennifer Xu*, *Rama Chellappa*, *Vishal M. Patel*
IEEE/CVF Winter Conference on Applications of Computer Vision (WACV 2025) (Oral)

6. **FaceMoE: Mixture of Experts for Low-resolution Face Recognition**
Kartik Narayan, *Vishal M. Patel*
Under Review. [paper]

7. **Training-Free Stylized Abstraction**
*Aiman Rahman**, ***Kartik Narayan****, *Vishal M. Patel*
Under Review. [arXiv]

8. **Investigating Social Biases in Multimodal LLMs**
*Malsha Perera**, ***Kartik Narayan****, *Vishal M. Patel*
2025 19th IEEE International Conference on Automatic Face and Gesture Recognition (FG 2025). [paper]

9. **Improved Representation Learning for Unconstrained Face Recognition**
*Nithin Gopalakrishnan Nair**, ***Kartik Narayan****, *Maitreya Suin*, *Ram Prabhakar*, *Jennifer Xu*, *Soraya Stevens*, *Joshua Gleason*, *Nathan Shindman*, *Rama Chellappa*, *Vishal M. Patel*
2025 19th IEEE International Conference on Automatic Face and Gesture Recognition (FG 2025). [paper]

10. **RestoreVAR: Visual Autoregressive Generation for All-in-One Image Restoration**
Sudarshan Rajagopalan, ***Kartik Narayan***, *Vishal M. Patel*
Under Review. [arXiv]

11. **INFER: Implicit Neural Features for Exposing Realism**
Dhananjaya Jayasundara, ***Kartik Narayan***, *Vishal M. Patel*
Under Review. [paper]

12. **Hyp-OC: Hyperbolic One Class Classification for Face Anti-Spoofing**
Kartik Narayan, *Vishal M. Patel*
2024 18th IEEE International Conference on Automatic Face and Gesture Recognition (FG 2024)

13. **DeePhyNet: Towards Detecting Phylogeny in Deepfakes**
Kartik Thakral, *Harsh Agarwal*, ***Kartik Narayan***, *Surbhi Mittal*, *Mayank Vatsa*, *Richa Singh*
IEEE Transactions on Biometrics, Behavior, and Identity Science (T-BIOM)

14. **DeePhy: On Deepfake Phylogeny**
Kartik Narayan, *Harsh Agarwal*, *Kartik Thakral*, *Surbhi Mittal*, *Mayank Vatsa*, *Richa Singh*
2022 IEEE International Joint Conference on Biometrics (IJCB 2022)

15. **DeSI: Deepfake Source Identifier for Social Media**
Kartik Narayan, *Harsh Agarwal*, *Surbhi Mittal*, *Kartik Thakral*, *Suman Kundu*, *Mayank Vatsa*, *Richa Singh*
Proceedings of the IEEE/CVF Conference on Computer Vision and Pattern Recognition Workshops (CVPRW 2022)

16. **Using Epidemic Modeling, Machine Learning & Control Feedback Strategy for Policy Management of COVID-19**
Kartik Narayan, *Heena Rathore*, *Faycal Znidi*
IEEE Access 10 (2022): 98244–98258

17. **Leveraging Ambient Sensing for the Estimation of Curiosity-Driven Human Crowd**
Anirban Das, ***Kartik Narayan***, *Suchetana Chakraborty*
2022 IEEE International Systems Conference (SysCon 2022)

Research Experience

Apple Inc. Seattle, WA
Ph.D. Research Intern *Summer 2025*

- Multimodal LLMs for knowledge-intensive and information seeking questions
- Equipping MLLMs with web-search agent and enabling MLLM reasoning for web-search calls.
- Incentivizing MLLM for self-correction and self-verification after initial response.

Johns Hopkins University Baltimore, Maryland
Research Assistant, Vision and Image Understanding Lab advised by Dr. Vishal M. Patel *2023 - Present*

- Leading research efforts for the IARPA BRIAR grant, focusing on face recognition in extreme scenarios.
- Worked on designing a multi-task model for multiple face analysis tasks.
- Evaluated Multimodal LLMs on face understanding, and explored future directions such as SFT and tools use.
- Currently working video diffusion models for physics-aware video generation.
- Tackling fundamental issues in T2V models such as text-rich video generation.

Indian Institute of Technology Jodhpur Jodhpur, India
Student Researcher, IAB Lab advised by Prof.Richa Singh and Prof.Mayank Vatsa *2022 - 2023*

- Worked on deepfake video generation, with a special emphasize on multi-face, low-resolution, and occluded videos.
- Introduced the concept of phylogeny (evolution) in deepfake video generation by sequentially swapping multiple faces.
- Developed the DeSI algorithm, capable of detecting deepfake videos on the Twitter platform and predicting their spread.

Academic Services

- **Invited Reviewer**: CVPR, ICCV, ECCV, AAAI, NeurIPS, TPAMI, WaCV, IJCB, TIFS, TBIOM, IJCV, PR

Skills Summary

- **Programming**: Python, C/C++, JavaScript
- **ML/DL**: PyTorch, TensorFlow, Keras, OpenCV, Sklearn, Numpy, Pandas, Matplotlib,
- **Development**: HTML, CSS, React.js, Node.js, Bootstrap, Firebase, MongoDB, ReactNative
- **Tools**: Docker, Kubernetes, GIT, AWS

Teaching Experience

Teaching Assistantship: Assisted in teaching by conducting weekly lab sessions, holding special doubt-clearing sessions, preparing quizzes, and grading assignments for the following courses:

- Deep Learning [*Spring 2023*]
- Introduction to Machine Learning [*Fall 2022*]
- Pattern Recognition and Machine Learning [*Spring 2022*]

Co-curricular Activities

- **Internship Head, CSE at the placement cell of IIT Jodhpur** [*2021 - 2022*]
  Coordinated with companies to invite them for campus internships and placements.
- **Head of technical events in Prometeo, IIT Jodhpur** [*2021 - 2022*]
  Led a team of 50+ students to organize technical competitions, attracting over 1,500 participants from across India.
- **Secretary of PHEME, The IITJ Newsletter Club** [*2020 - 2021*]
  Managed a club of 80+ members responsible for creating newsletters, reports, conducting surveys, etc.
- **Student Guide at Student Wellbeing Committee, IITJ** [*2020 - 2023*]
  Mentored 10 freshmen from diverse backgrounds to support their transition into college, guiding them in both academic and non-academic pursuits.