Kartik Narayan

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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, unified vision models, parameter-efficient fine-tuning, face segmentation, and representation learning.

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

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

3. **Kartik Narayan**, Vibashan VS, Rama Chellappa, Vishal M. Patel. **FaceXFormer: A Unified Transformer for Facial Analysis**. *Under Review.* [arxiv]

4. **Kartik Narayan**, Vibashan VS, Vishal M. Patel. **SegFace: Face Segmentation of Long-Tail Classes**. *Under Review.* [paper]

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

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

7. Nithin Gopalakrishnan Nair, **Kartik Narayan**, Maitreya Suin, Ram Prabhakar, Jennifer Xu, Soraya Stevens, Joshua Gleason, Nathan Shindman, Rama Chellappa, Vishal M. Patel. **Improved Representation Learning for Unconstrained Face Recognition**. *Under Review.*

8. Kartik Thakral, Harsh Agarwal, **Kartik Narayan**, Surbhi Mittal, Mayank Vatsa, Richa Singh. **DeePhyNet: Towards Detecting Phylogeny in Deepfakes**. *IEEE T-BIOM.* [paper]

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

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

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

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

Research Experience

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.
- Currently developing an evaluation suite and an instruction-tuning dataset to benchmark multimodal LLMs on face understanding tasks.

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.

University of Texas, San Antonio Remote
Research Intern under Dr.Heena Rathore *2021 - 2022*

- Predicted optimal constraints for the SIR differential equation to improve the forecasting of COVID-19 case numbers.

Academic Services

- **Invited Reviewer**: CVPR, ECCV, AAAI, NeurIPS, TPAMI, TIFS, TBIOM, IJCV

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.