

Ketul Shah

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Research Interests

Robust Action Recognition, Synthetic Data, Domain Adaptation, 3D Vision

Education

- Johns Hopkins University** **2020–Present**
• *Ph.D. in Electrical and Computer Engineering* *Baltimore, MD, USA*
Advisor: Prof. Rama Chellappa
- University of Maryland, College Park** **2018–2020**
• *M.S. in Electrical and Computer Engineering; GPA: 3.67/4.0* *College Park, MD, USA*
- Indian Institute of Technology, Madras** **2013–2018**
• *B.Tech & M.Tech in Electrical Engineering; GPA: 8.30/10.0* *Chennai, India*
• Minor in Operations Research
Advisor: Prof. Kaushik Mitra

Current Work

- **MV2MAE: Multi-View Video Masked Autoencoders**
Ketul Shah, Robert Crandall, Jie Xu, Peng Zhou, Marian George, Mayank Bansal, Rama Chellappa
Under submission
- **Ground-to-Air Generalization for Human Action Recognition via Synthesis and Masked Alignment**
Ketul Shah, Anshul Shah, Arun Reddy, Aniket Roy, Arushi Sinha, Celso M. de Melo, Rama Chellappa
Under submission
- **Cap2Aug: Caption guided Image to Image data Augmentation**
Aniket Roy, **Ketul Shah***, Anshul Shah*, Anirban Roy, Rama Chellappa
Under submission
- **DiffNat: Improving Diffusion Image Quality Using Natural Image Statistics**
Aniket Roy, Maitreya Suin, Anshul Shah, **Ketul Shah**, Jiang Liu, Rama Chellappa
Under submission
- **Unsupervised Video Domain Adaptation with Masked Pre-Training and Collaborative Self-Training**
Arun Reddy, William Paul, Corban Rivera, **Ketul Shah**, Celso M de Melo, Rama Chellappa
Under submission

Publications

- **Multi-View Action Recognition using Contrastive Learning**
Ketul Shah, Anshul Shah, Chun Pong Lau, Celso M. de Melo, Rama Chellappa
WACV 2023
- **Synthetic-to-Real Domain Adaptation for Action Recognition: A Dataset and Baseline Performances**
Ketul Shah*, Arun Reddy*, William Paul, Rohita Mocharla, Judy Hoffman, Kapil D. Katyal,
Dinesh Manocha, Celso M. de Melo, Rama Chellappa
ICRA 2023
- **Improved Modeling of 3D Shapes with Multi-view Depth Maps**
Ketul Shah*, Kamal Gupta*, Susmija Jabbireddy*, Abhinav Shrivastava, Matthias Zwicker
3DV 2020 (Oral Presentation)
- **HaLP: Hallucinating Latent Positives for Skeleton-based Self-Supervised Learning of Actions**
Anshul Shah, **Ketul Shah***, Aniket Roy*, Shlok Mishra, David Jacobs, Anoop Cherian, Rama Chellappa
CVPR 2023

- **FeLMi : Few shot Learning with hard Mixup**
Aniket Roy, Anshul Shah, **Ketul Shah**, Prithviraj Dhar, Anoop Cherian, Rama Chellappa
NeurIPS 2022
- **Photorealistic Image Reconstruction from Hybrid Intensity and Event based Sensor**
Prasan A Shedligeri, **Ketul Shah**, Dhruv Kumar, Kaushik Mitra
arXiv

Professional Experience

- **Amazon Just Walk Out** **Summer 2023**
Applied Scientist Intern. Mentor: Dr. Robert Crandall Seattle, WA
 - Worked on large-scale pre-training using multi-view videos.
- **Amazon Web Services** **Summer 2021**
Applied Scientist Intern. Mentors: Dr. Kaustav Kundu, Dr. Xinyu Li Seattle, WA (Remote)
 - Worked on using self-supervised representation learning for improving batch active learning.
- **University of Maryland** **Summer 2019**
Research Assistant under Prof. Rama Chellappa College Park, MD
 - Worked on spatio-temporal action detection in untrimmed videos, specifically for infrared videos. Improved performance of the proposal-based method by 13.5% on infrared modality. Exploring GAN formulations for leveraging multiple modalities available at training time.
- **NVIDIA Graphics Pvt. Ltd.** **Summer 2016**
Software Engineering Intern Bengaluru, India
 - Part of a multi-team venture to extract usage data of CPU farm from logged data; streamlined load allocation to the CPU farm, also incorporated peak load times.

Teaching and Volunteer Experience

- **Reviewer**
ICLR '[22,24]', NeurIPS '[22,24]', WACV '24, ECCV '20
- **Course Assistant** **Fall 2022, Fall 2020**
Machine Perception Johns Hopkins University
- **Teaching Assistant** **Spring 2019**
Advanced Data Structures University of Maryland, College Park
- **Teaching Assistant** **Spring 2018**
Advanced Electrical Engineering Lab IIT Madras
- **Teaching Assistant** **Fall 2017**
Digital Signal Processing IIT Madras

Relevant Courses

Computer Vision, Machine Learning: Probabilistic Models for the Visual Cortex, Advanced Techniques for Visual Learning and Recognition, Machine Learning for Computer Vision, Deep Learning for Image Processing, Image Understanding, Advanced Computer Graphics, Computational Linguistics I, Foundations of Reinforcement Learning, Statistical Pattern Recognition

Mathematics and others: Information Theory, Introduction to Game Theory, Random Processes for Communication and Control, Linear Algebra for Engineers, Probability Foundations for EE

Programming Skills

- **Libraries and Tools:** PyTorch, Amazon SageMaker, PyTorch Lightning, Weights & Biases, Tensorboard, Caffe, TensorFlow, OpenAI Gym, Linux, LaTeX, Bash, OpenCV, Blender, AWS
- **Languages:** Python, C, C++, MATLAB, Java