Rishubh Parihar

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My research focuses on making vision-generative models more controllable by providing new interfaces to interact with these models. Along this theme, I have worked on several projects ranging from fine-grained image editing to mitigating biases in deep generative models and guiding generative models for synthetic data generation to train downstream models.

Education

Indian Institute of Science, Bangalore **2021 onwards**
Ph.D. student, Department of Computational Data Sciences ***9.70/10***

Indian Institute of Technology, Delhi **2014-2018**
Bachelor of Technology (B.Tech) in Mathematics and Computing ***8.51/10***

Relevant coursework

Deep Learning for Computer Vision, Advanced Image Processing, Pattern Recognition and Neural Networks, Computer Graphics, Advanced Deep Learning, Stochastic Models and Applications, Computational Methods for Optimization, Video Analytics

Publications

[1] PreciseControl: Enhancing Text-to-Image Diffusion Models with Fine-Grained Attribute Control
R Parihar*, Sachidanand VS*, S Mani, T Karmali, R Venkatesh Babu*
European Conference on Computer Vision (ECCV'24)

[1] Text2Place: Affordance Aware Human Guided Placement
R Parihar*, H Gupta, Sachidanand VS, R Venkatesh Babu*
European Conference on Computer Vision (ECCV'24)

[1] Balancing Act: Distribution-Guided Debiasing in Diffusion Models
R Parihar*, Abhijnya Bhat*, Abhipsa Basu, Saswat Mallick, Jogendra Kundu, R Venkatesh Babu*
Computer Vision and Pattern Recognition (CVPR'24)

[2] We never go out of Style: Motion Disentanglement by Subspace Decomposition of Latent Space
R Parihar*, R Magazine, P Tiwari, R Venkatesh Babu*
AI for Content Creation workshop (CVPRW'23)

[3] Exploring Attribute Variations in Style-based GANs Using Diffusion Models
R Parihar*, B Prasanna, R Magazine, Sarthak Vora, T Karmali, Varun Jampani, R Venkatesh Babu*
Workshop on Diffusion Models (NeurIPSW'2023)

[4] Strata-NeRF: Neural Radiance Fields for Stratified Scenes
Ankit Dhiman, R Srinath, Harsh Rangwani, ***Rishubh Parihar****, Lokesh R Boregowda, Srinath Sridhar, R Venkatesh Babu*
International Conference on Computer Vision (ICCV'23)

[5] Everything is there in Latent Space: Attribute Editing and Attribute Style Manipulation by StyleGAN Latent Space Exploration
R Parihar*, A Dhiman, T Karmali, R Venkatesh Babu*
ACM Conference on Multimedia (ACMMM'22)

[6] Hierarchical Semantic Regularization of Latent Spaces in StyleGANs
T Karmali, ***R Parihar****, S Agrawal, H Rangwani, V Jampani, M Singh, R Venkatesh Babu*
European Conference on Computer Vision (ECCV'22)

[7] FabSoften: Face Beautification via Dynamic Skin Smoothing, Guided Feathering, and Texture Restoration
S Velusamy, ***R Parihar****, R Prasad, A Rege*
NTIRE workshop (CVPRW 2020)

For complete publication results, please visit my Google Scholar profile.

Experience

Sharechat / Data Scientist Nov 2020 - Present

Multi-Modal content understanding

- Developed a multi-modal click-bait detection model for videos incorporating features from audio, video, and text modalities
- Adapted semi-supervised learning framework to deal with small set of labeled data and implemented mean teacher approach to propagate labels from a small set of manually labeled data to a large unlabeled dataset
- Experimented with various state-of-the-art deep networks for feature extraction for audio and video modalities and deployed the model on cloud for MOJ application (short video platform) for real time inference.

Samsung R&D Institute Bangalore / Research Engineer Jul 2018 – Oct 2020

Self-Supervised video representation learning

- Design a pretext task based on object motion boundary prediction for self-supervised representation learning from videos
- In the first stage, the network was trained on unlabeled videos from the UCF101 dataset or feature learning
- In the second stage, the network was fine-tuned on HMDB51 dataset for video action classification and video retrieval tasks
- Experimented with various state-of-the-art video architectures (S3D-G, TSM) and network training strategies

SingleTake: A core camera feature for Samsung Mobile devices

- Designed and developed a motion classifier built over TSM to classify motion energy and motion type for a given video
- Performed weight quantization and model-pruning to make the model suitable for near real time inference on mobile device
- Involved in the conceptualization, design, development and commercialization of *SingleTake* for Samsung Galaxy S20

Face beautification module for Samsung mobile devices

- Designed a wavelet-based face editing algorithm for skin texture enhancement which removes the non-uniformities in skin region while retaining fine-grained texture and deployed it to a range of Samsung mobile devices.
- Worked on various face beautification modules like skin region segmentation, lip segmentation and blemish removal
- Our framework provided personalized beautification based on gender, age and skin type and achieved superior quality results in overall appearance as compared to competitor mobile devices

Awards and Achievements

- Achieved **SGPA of 10** in the second semester of Ph.D. coursework
- Awarded **PMRF (direct entry)** in August 2021
- **Best presentation award at EECS - Symposium 2023**, IISc in visual analytics cluster
- Secured **All India Rank - 373** in JEE Advanced 2014 among 1,50,000 aspirants
- **IIT Delhi Semester Merit Award** (top 7% of the batch) for meritorious academic performance in the eighth semester
- Received **"Jury Special"** award for Best Demo at NIPUN 2018 (an annual tech fair) at Samsung R&D Institute, Bangalore
- Received **"Spot Award"** for development and commercialization of Smart Beauty Solution for Samsung Galaxy S10