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Maitreya Suin

Work Experience

2024 – Present **Senior Researcher**, AI Research, *Samsung AI Center*, Toronto.
- *Working on research and commercial projects focused on camera ISPs, image super-resolution, and quality enhancement.*

2022 – 2024 **Postdoctoral Researcher**, Computer Vision, *Johns Hopkins University*, USA, Research Advisor: Prof. Rama Chellappa.
- *Worked on diffusion models and their application for extreme image/video quality enhancement for downstream detection and recognition tasks, personalized generation from prompts, and perceptual quality improvement. Included in the deliverables for multiple IARPA projects (BRIAR and WRIVA).*

Education

2017–2022 **MS + PhD**, Image Processing and Computer Vision, *Indian Institute of Technology*, Madras, Research Advisor: Prof. A.N.Rajagopalan.
CGPA - 8.59

2012–2016 : **Bachelor of Technology**, *Electronics and Communication Engineering*, Institute of Engineering and Management, Kolkata.
CGPA - 9.04

Research Areas

- Diffusion Model, Personalized Image Generation, Image and Video Editing, Face Restoration, Face Recognition, Biometric, Camera ISP, RAW Processing, Adaptive Neural Network Design, Image and Video Enhancement, Image Inpainting, Deep/Deep-Reinforcement Learning.

Publications

Under Review Aniket Roy, **Maitreya Suin**, Rama Chellappa, *Zero-shot Customizing of Objects via Textual Inversion*.

IJCAI-2024 **Maitreya Suin** and Rama Chellappa, *CLR-Face: Conditional Latent Refinement for Blind Face Restoration Using Score-Based Diffusion Models*.

Under Review Aniket Roy, **Maitreya Suin**, Anshul Shah, Prithviraj Dhar, Ketul Shah, Rama Chellappa, *DiffNat: Fine-tuning text-to-image diffusion model with natural image statistics*.

Under Review **Maitreya Suin**, Kuldeep Purohit and A.N. Rajagopalan, *Spatially-Attentive Patch-Hierarchical Network with Adaptive Sampling for Motion Deblurring*.

WACV-2024 **Maitreya Suin**, Nithin Gopalakrishnan Nair, Chun Pong Lau, Vishal M. Patel and Rama Chellappa, *Diffuse and Restore: A Region-Adaptive Diffusion Model for Identity-Preserving Blind Face Restoration* , Winter Conference on Applications of Computer Vision (WACV), 2024.

IJCB-2023 Chun Pong Lau, **Maitreya Suin**, and Rama Chellappa, *ATDetect: Face Detection and Keypoint Extraction at Range and Altitude*, IEEE International Joint Conference on Biometrics, 2023.

TCSVT Praveen Kandula, **Maitreya Suin** and A.N. Rajagopalan, *Illumination-adaptive unpaired low-light enhancement*, IEEE Transactions on Circuits and Systems for Video Technology.

ECCVW-2022 Snehal S. Tomar, **Maitreya Suin** and A.N. Rajagopalan, *Hybrid Transformer based Feature Fusion for Self-Supervised Monocular Depth Estimation*, European Conference on Computer Vision Workshop (AIM), 2022.

ICCV-2021 **Maitreya Suin**, Kuldeep Purohit and A.N. Rajagopalan, *Distillation Guided Image Inpainting*, International Conference on Computer Vision, 2021.

ICCV-2021 Kuldeep Purohit, **Maitreya Suin**, A.N. Rajagopalan and Vishnu Naresh Boddeti, *Spatially-Adaptive Image Restoration using Distortion-Guided Networks*, International Conference on Computer Vision, 2021.

CVPR-2021 **Maitreya Suin** and A.N. Rajagopalan, *Gated Spatio-Temporal Attention-Guided Video Deblurring*, Conference on Computer Vision and Pattern Recognition, 2021.

CVPR-2020 **Maitreya Suin**, Kuldeep Purohit and A.N. Rajagopalan, *Spatially-Attentive Patch-Hierarchical Network for Adaptive Motion Deblurring*, Conference on Computer Vision and Pattern Recognition, 2020.

AAAI-2020 (Oral) **Maitreya Suin** and A.N. Rajagopalan, *An Efficient Framework for Dense Video Captioning*, Thirty-Fourth AAAI Conference on Artificial Intelligence, 2020.

JSTSP **Maitreya Suin**, Kuldeep Purohit and A.N. Rajagopalan, *Degradation Aware Approach to Image Restoration Using Knowledge Distillation*, IEEE Journal of Selected Topics in Signal Processing. Impact Factor: 6.856

ICCVW-2019 Kuldeep Purohit, **Maitreya Suin**, Praveen Kandula and A.N. Rajagopalan, *Depth-guided Dense Dynamic Filtering Network for Bokeh Effect Rendering*, International Conference on Computer Vision Workshop, 2019.

Co-Authored Workshop Proceedings

CVPRW NTIRE 2021 Challenge on Depth Guided Image Relighting: Report.

CVPRW NTIRE 2021 Challenge on Image Deblurring: Report.

ECCVW AIM 2020 challenge on rendering realistic bokeh.

ECCVW AIM 2020 challenge on image extreme inpainting.

ECCVW AIM 2020 challenge on efficient super-resolution: Methods and results.

ECCVW AIM 2020: Scene relighting and illumination estimation challenge.

CVPRW NTIRE 2020 challenge on image and video deblurring: Report.

ICCVW AIM 2019 Challenge on Real-world Super-resolution: Methods and Results.

ICCVW AIM 2019 Challenge on Image Extreme Super-Resolution: Methods and Results.

ICCVW AIM 2019 Challenge on Image Demoireing: Methods and Results.

ICCVW AIM 2019 Challenge on Bokeh Effect Synthesis: Methods and Results.

CVPRW NTIRE 2019 Challenge on Image Colorization: Report.

CVPRW NTIRE 2019 Image Dehazing Challenge Report.

Awards and Achievements

- Received Institute Research Award from IIT Madras for PhD Thesis.
- Our research work has been featured on *Ministry of Education, India* and *News Websites* .
- Our team from IPCV Lab, IITM developed Mixed-reality segment for the *2020 Virtual Convocation of IIT Madras*..
- Winner of the Image Colorization Challenge in **NTIRE**: New Trends in Image Restoration and Enhancement, **CVPR** 2019.
- 1^{st} Runner up of the Bokeh Effect and Image SR Challenges, AIM workshop **(ICCV)** 2019.
- 2^{nd} Runner up of the Image Relighting challenge (Track 3) of AIM Workshop (**ECCV**) 2020.
- Received **travel grant from Google Research** to attend the Thirty-fourth AAAI Conference on Artificial Intelligence (**AAAI**), 2020, New York, USA.

Experiences

- Invited talk at Indian Institute of Technology, Madras.
- Served as a reviewer in CVPR, TPAMI, IJCV, AAAI, TIP, TMI.
- Attended WACV-'24, ICCV-'23, CVPR-'23, ICCV-'21, CVPR-'21, CVPR-'20, AAAI-'20 conferences.
- Attended workshop on Computational Brain Research by CCBR, IIT Madras (2019).
- Served as a teaching assistant for Deep Learning, Image Signal Processing, Modern Computer Vision courses under Prof. A.N. Rajagopalan and Prof. Kaushik Mitra..

Skills

Programming	Python, C/C++, CUDA programming, MATLAB.
Libraries	PyTorch, Tensorflow, Torch, OpenCV, Gym-OpenAI, Caffe (Familiar).

Recent Course-works

- Reinforcement Learning, Deep Learning, Image Processing, Geometry and Photometry-based Computer Vision, Linear Algebra, Probability Foundations, Digital Signal Processing, Adaptive Signal Processing.

References

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