Aakanksha

Image Processing and Computer Vision Lab
IIT Madras, Chennai, India 600036
aakankshajha30@gmail.com, Phone: +91 8011507903
https://scholar.google.com/citations?user=cE-6Zh8AAAAJ&hl=en

RESEARCH INTEREST

Image Processing, Computer Vision, Deep Learning, Multi-modal Learning for Vision Tasks, Robustness in Deep Learning, Data Augmentation, Image Restoration, Document Restoration

EDUCATION

Indian Institute of Technology Madras, Chennai, India — July 2018 - Present
MS+PhD in Image Processing and Computer Vision
Research Advisor: Prof. A.N.Rajagopalan
(*On Medical Leave : Aug 2019 - Dec 2019*)
CGPA: 8.03

Indian Institute of Information Technology Guwahati, India — July 2014 - May 2018
B.Tech in Electronics and Communication Engineering
CGPA: 9.39

WORK EXPERIENCE

Dense Text Recognition in Document Images with Distortions — **July 2024 – Feb 2026**
(Advisor: Dr. A.N. Rajagopalan)
Designed and developed a dataset incorporating geometric and photometric distortions for dense text data extracted from publicly available sources. Also benchmarked the state of the art performances on it.

Depth-consistent Motion Blur Generation and Deblurring — **October 2024 –December 2025**
Developed a depth-consistent motion blur generation strategy and also a weakly supervised deblurring paradigm to deblur it.

Video-based characterization of the bounce of a spinning ball, — **May 2021 – December 2024**
Centre of Excellence for Sports Science and Analytics-IITM (*https://cessa.iitm.ac.in/*)
(Advisors: Dr. A.N. Rajagopalan, Dr. M. Panchagnula)
Working on an approach to develop a low-cost Decision Review System (DRS) using asynchronous consumer-grade video cameras. In particular, involved in the design and development of the imaging setup, and the development of an algorithm for a video-based robust estimation of the 3D spin of a ball.

Blurred Image Segmentation, IPCV Lab, IITM — **July 2022 – November 2022**
(Advisor: Dr. A.N. Rajagopalan)
Developed a class-centric augmentation strategy using segmentation annotations to simultaneously model dynamic scene and camera motion blur which gives state-of-the-art performance for segmentation of blurred images.

Weak Supervision for Monaural-to-Binaural audio conversion, IPCV Lab, IITM
(Advisor: Dr. A.N. Rajagopalan) — **September 2020 – March 2021**
Collaboratively developed an approach to leverage the location of a sound source as weak supervision to impart spatial binaural quality to monaural audio using a significantly lesser number of real monaural-binaural pairs.

Robustness in Super-Resolution, IPCV Lab, IITM — **June 2020 - August 2020**
(Advisor: Dr. A.N. Rajagopalan)
Collaboratively developed an approach to obtain robust and faithful super-resolved images for multiple low-resolution images corresponding to the same high-resolution image by extracting latent features similar to the clean low-resolution image.

Watermark Detection in Frequency Domain, IIT Patna — **June 2016 – July 2016**
(Advisor: Dr. Rajib K. Jha)
Improved the detection of randomly generated, invisible watermarks in the frequency domain using Suprathreshold Stochastic Resonance leading to a publication.

TEACHING EXPERIENCE

- Served as teaching assistant for Deep Learning, Image Signal Processing, Modern Computer Vision courses under Prof. A.N. Rajagopalan and Prof. Kaushik Mitra.
- Also served as teaching assistant for Image Signal Processing and Modern Computer Vision courses offered by Prof. A.N. Rajagopalan on NPTEL.

AWARDS

- Women Leading IITM (WLI) Grant towards completing her PhD in 2025.
- Google Travel Grant and CVPR DEI Grant to attend CVPR'23.
- Prof. Malathi Veeraraghavan (MV) scholar for 2021.
- *Chairman's Medal* for Outstanding Performance in Electronics and Communication Engineering (2018).

PUBLICATIONS	[1] Aakanksha*, Sujal Burad*, Rajagopalan A.N. and Sumit "ENet-GP: Unified Document Image Restoration," *(under review)* [2] Aakanksha, and Rajagopalan A.N., "DaMBA: Depth-aware Motion Blur Augmentation for Robust Scene Understanding," (*under review)* [3] Aakanksha, and Rajagopalan A.N., "Annotation-free Dynamic Scene Motion Blur Synthesis," (*under review*) [4] Aakanksha, Ashish Kumar and A. N. Rajagopalan, "Ball Trajectory and Spin Analysis from Asynchronous Videos," in IEEE Sensors Letters, 2025 [5] Aakanksha, and A. N. Rajagopalan. "Improving Robustness of Semantic Segmentation to Motion-Blur using Class-Centric Augmentation." Proceedings of IEEE/CVF Conference on Computer Vision and Pattern Recognition. 2023. [6] Rachavarapu, Kranthi Kumar, Aakanksha, Vignesh Sundaresha, and A. N. Rajagopalan. "Localize-to-Binauralize: Audio Spatialization from Visual Sound Source Localization." Proceedings of the IEEE/CVF International Conference on Computer Vision. 2021. [7] Saurabh Goswami, Aakanksha and A. N. Rajagopalan, "Robust Super-Resolution of Real Faces using Smooth Features," Workshop on Adversarial Robustness in the Real World, European Conference on Computer Vision Workshops (ECCV W) 2020. [8] S. Kumar, R. K. Jha and Aakanksha, "Characterization of Supra-threshold Stochastic Resonance for Uniform Distributed Signal with Laplacian and Gaussian Noise," *2017 International Conference on Noise and Fluctuations (ICNF)*, Vilnius, 2017, pp. 1-4, doi: 10.1109/ICNF.2017.7986027
SKILLS	Programming: Python, MATLAB, C/C++ Libraries: PyTorch, Tensorflow, OpenCV
RECENT COURSEWORK	Image Signal Processing, Computational Photography, Geometry & Photometry-Based Computer Vision, Introduction to Machine Learning, Fundamentals of Deep Learning, Linear Algebra, Probability Foundations
CO-CURRICULAR	- Reviewer for CVPR'23, WomenInCV@ CVPR'23, NeurIPS'23, ICPR'24, TPAMI'24, CVPR'26, WAD @ CVPR'26. - Attended the workshop - *Summer School on Computer Vision* organised by CVIT, IIIT Hyderabad (2019) - Attended the first '*Perspective Series*' interdisciplinary workshop titled '*The Mind Matters: Language, Cognition and Other Correlations*' at IIIT Guwahati (2017).
EXTRA-CURRICULAR	- Invited to deliver a talk to first-year students at IIIT Guwahati as part of their Induction Programme 2022. - Participated in the E-Yantra Robotics competition sponsored by MHRD. - Volunteered as a member for the organizing committee of the Cultural Fest at IIIT Guwahati. Participated and won prizes in Short Story Writing and Group Dance. - Helped organize the first 'Perspective Series' interdisciplinary workshop titled 'The Mind Matters: Language, Cognition and Other Correlations' in 2017.

REFERENCES

Prof. A.N. Rajagopalan
Professor
raju@ee.iitm.ac.in
Department of Electrical Engineering
Indian Institute of Technology Madras

Prof. Mahesh Panchagnula
Professor
mvp@iitm.ac.in
Department of Applied Mechanics
Indian Institute of Technology Madras

Prof. Kaushik Mitra
Associate Professor
kmitra@ee.iitm.ac.in
Department of Electrical Engineering,
Indian Institute of Technology Madras