Sandeep Mishra

Ph.D Student, University of Texas at Austin

Advisor: ***Prof. Alan C. Bovik***

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Webpage

Research Interests: Image/Video/3D Generative AI, Image/Video Quality Assessment and Enhancement

Education

University of Texas at Austin
Graduate Student Researcher - Electrical and Computer Engineering *2021 - Present*
Anticipated graduation - 12/2025

Indian Institute of Technology Kharagpur, India
B.Tech(E & ECE) + M.Tech Dual Degree in Visual Information & Embedded Systems *2014 - 2019*
Minor in Computer Science & Technology

Publication

YouDream: Generating Anatomically Controllable Consistent Text-to-3D Animals
Sandeep Mishra*, Oindrila Saha*, Alan C. Bovik*
Neural Information Processing Systems (NeurIPS), 2024

C3DAG: Controlled 3D Animal Generation using 3D pose guidance
Sandeep Mishra*, Oindrila Saha*, Alan C. Bovik*
AI for 3D Generation @ CVPR 2024

LIVE-ASL: Subjective and Objective Quality Assessment of American Sign Language Videos
Sandeep Mishra*, Shashank Gupta, Ramit Pahwa, Margaret H. Pinson, Alan C. Bovik*
IEEE Transactions on Image Processing - under review (2024)

Subjective and Objective Analysis of Indian Social Media Video Quality
Sandeep Mishra*, Mukul Jha, Alan C. Bovik*
IEEE Transactions on Image Processing - under review (2024)

Perceptual Video Quality Assessment: The Journey Continues!
Avinab Saha, S. K. Pentapati, Zaixi Shang, Ramit Pahwa, Bowen Chen, Hakan Emre Gedik, ***Sandeep Mishra****, Alan C Bovik*
Frontiers in Signal Processing, 2023

Re-IQA : Unsupervised Learning for Image Quality Assessment in the Wild
Sandeep Mishra*, Avinab Saha, Alan C. Bovik*
Conference on Computer Vision and Pattern Recognition (CVPR), 2023

RecSal : Deep Recursive Supervision for Visual Saliency Prediction
Sandeep Mishra *and Oindrila Saha*
British Machine Vision Conference (BMVC), 2020

Industrial Experience

- **ByteDance** San Jose, CA
  Research Intern, TikTok Intelligent Creation Team *Summer 2024*
  - ▷ Built a spatial video database of 178 videos for blind spatial video quality assessment (BSVQA).
  - ▷ Conducted human study to acquire ground truth human opinions for quality of pristine and distorted video sequences.
  - ▷ Creating an open-source Blind Spatial Video Quality Assessment metric. GitHub Repository

- **SRIB - Samsung R&D Institute Bangalore** Bangalore, India
  Lead Research Engineer, Visual Intelligence Group (VIG) *2019 - 2021*
  AI Gallery Zoom
  - ▷ Designed a low complexity ($\approx 2K$ parameters) CNN based Image Super-Resolution software pipeline.
  - ▷ Trained three different networks configurations and developed classification and detection modules to handle different sources of images in Gallery to produce artifact free super-resolved images under all scenarios.
  - ▷ Commercialized in more than 10 latest Samsung Mid-Tier mobile phones and flagship mobile devices in 2021.

▷ Awarded **Samsung Citizen Award** and **Spot Award** for remarkable contribution and successful commercialization.

AI Video Super Resolution

▷ Developed a Video SR solution (on top of optical zoom of 4x) for Samsung smartphones.

▷ Implemented unsupervised Cycle-GAN for transferring wide-lens images to Tele-lens domain (self captured).

▷ SR networks when trained on this synthetic data produced outputs with highly enhanced details, sharpness and reduced noise levels as compared to the existing solutions (using conventional datasets) without introducing any artifacts.

▷ Awarded **Spot Award** for remarkable contribution in validating PoC and achieving high quality Super-Resolution on videos captured through Tele-Lens.

- **SRIB - Samsung R&D Institute Bangalore** Bangalore, India
  Research Intern, Visual Intelligence Group (VIG) *Summer 2018*
  ▷ Developed a deep CNN based 3D Human Pose estimation model using a single RGB camera without a depth sensor.
  ▷ Implemented VNect decoder along with MobileNetV2 encoder and ResNet50 encoder and evaluated their performance.
  ▷ Achieved real time applications with a significantly small sized model that could be implemented on a mobile device.

Skills

- Programming: Python, C/C++
- Scientific: Pytorch, TensorFlow, MATLAB

Awards and Honors

- Honored with **Samsung Citizen Award** and **Spot Award** for excellent technical contribution in Samsung for the year 2020
- Secured All India Rank **487** in **JEE ADVANCED**-2014 (**secured 99.7 percentile**)
- Secured All India Rank **158** in **JEE MAINS**-2014 conducted by CBSE (**secured 99.99 percentile**)
- Secured All India Rank **102** in **Kishore Vaigyanik Protsahana Yojana**-2013 conducted by IISc, Bangalore and received scholarship for the same from Department of Science and Technology, Government of India
- Received **National Talent Search Examination** Scholarship from Ministry of Human Resource Development, India

Responsibilities

- **Teaching Assistantship**: Department of Electronics and Electrical Communication Engg., IIT Kharagpur
  ▷ Introduction to Electronics Lab: *Prof. Chetna Singhal & Prof. Shailendra Kumar Varshney* *2018*
  ▷ Image Processing Lab: *Prof. Sudipta Mukhopadhyay* *2019*
- Mentored a 4 week web development course organized by EduSpectrum for freshmen of IIT Kharagpur *2016*
- Awarded the Best NSS Volunteer (National Service Scheme, under Ministry of Youth Affairs & Sports, India) for excellent service towards education and development in villages near IIT Kharagpur *2014-16*