Nikhil Akalwadi

Center of Excellence in Visual Intelligence
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Education

KLE Technological University

MS (Engg) by Research *(Advised by Prof. Uma Mudenagudi)* 2023-present

B.E. in Electronics and Communication 2018-2022

ICS Mahesh PU College

Pre-University 2016-2018

Academic Positions

KLE Technological University

Undergraduate Researcher 2021-2022

(Advised by Prof. Uma Mudenagudi, Ramesh Ashok Tabib)

Undergraduate Researcher 2020-2021

(Advised by Prof. Ujwala Patil, Ramesh Ashok Tabib)

Industry Experience

Research Assistant, **CEVI-KLETech.** *(Advised by Prof. Uma Mudenagudi)* July 2022-present

Computer Vision Researcher (Internship), **CEVI-KLETech.** Jan-May 2022

Hardware Design Engineer (Internship), **Eartkey Pvt. Ltd.,** Aug 2020-Mar 2021

Outreach and Services in the Community

Peer Reviewing

Women in Machine Learning *@ NeurIPS* 2024

Advances in Image Manipulation Workshop *@ ECCV* 2024

AI for Visual Arts Workshop and Challenges *@ ECCV* 2024

Out-of-Distribution Generalisation in Computer Vision Foundation Models *@ ECCV* 2024

Geometry-grounded Representation Learning and Generative Modeling *@ ICML* 2024

IEEE Transactions on Image Processing 2024

IET Image Processing 2025

Women in Computer Vision *@ IEEE/CVF CVPR* 2024

Women in Computer Vision *@ IEEE/CVF ICCV* 2023

Program Committee

MarineVision Restoration Challenge, MaCVi *@ IEEE/CVF WACV* 2025

IEEE Conference on Engineering Informatics 2024

Program Volunteer

ACM SIGGRAPH Asia Tokyo - Student Volunteer 2024

3D Vision Summer School, IIIT Bangalore 2024

Program Participant

3D Vision Summer School, CVIT-IIIT Hyderabad 2022, 2023

Conference Attendee

The 9th National Conference on Computer Vision, Pattern Recognition, Image Processing, and Graphics (**NCVPRIPG**) @ IIST, Thiruvananthapuram — 2024

Service as Judge

Smart India Hackathon (SIH), Internal hackathon, KLETech. — 2023, 2024

Teaching and Mentorship

Teaching Assistant

Generative AI (winter course), KLETech — 2024

(Elective course on Generative AI, hands-on trending GenAI Models)

AICTE ATAL Faculty Development Program (FDP), KLETech. — 2023

(Python, HandsOn Computer Vision and Machine Learning)

Summer School on Visual Intelligence, CEVI-KLETech. — 2022, 2023, 2024

Mentorship

Summer School on Visual Intelligence, CEVI-KLETech. — 2021, 2022, 2023, 2024

Projects and Research

1. **"AI-Driven Human Digitization and Scene Reconstruction for Enhanced Game Asset Generation"** *(SERB – INAE Online and Digital Gaming Research Initiative)*

   Under the guidance of Prof. Uma Mudenagudi, I am working on **digitizing human NPCs (Non-Player Characters) and PCs (Player Characters) for video games**, leveraging advanced techniques in object and scene reconstruction. The project focuses on **generating high-quality 3D game assets by integrating AI-based methods** to enhance realism, interactivity, and detail in both characters and environments. As part of this initiative, I have **developed a web-based tool for 3D asset generation**, enabling intuitive interaction and streamlined asset creation through an accessible browser interface. This tool supports the game development pipeline by **simplifying the generation and management of realistic assets**, ultimately enriching the gaming experience.

2. **"Multispectral Image Analysis Towards Precision Agriculture"**

   During my undergraduate program, I worked with Prof. Ujwala Patil on multispectral image analysis pipeline for precision agriculture. My work focused on processing spectral images to assess crop and soil health. I developed libraries for integrating spectral cameras and preprocessing captured data.

3. **"Image Restoration and Enhancement",** *(Dept. of Science and Technology-Digital Poompuhar)*

   In my academic pursuits, I focused on low-light image enhancement under the guidance of **Prof. Uma Mudenagudi.** I published ***"LightNet: Generative Model for Enhancement of Low-Light Images."*** to improve image quality in challenging low-light conditions and also achieved 13th rank in the ***NTIRE 2022 Challenge at CVPR***, sharing valuable insights with the research community. Additionally, my research interests extend to image denoising, restoration, and enhancement. My recent research paper, ***"HNN: Hierarchical Noise-Deinterlace Net Towards Image Denoising,"*** published in the CVPR 2024 workshop, addresses advanced techniques in image denoising. This paper introduces a hierarchical approach denoise images, contributing to the broader field of image restoration. Notably, HNN can be extended from image denoising to other image restoration tasks such as image dehazing, shadow removal, and image deblurring. These extensions are detailed in the challenge reports titled ***"NTIRE 2024 Image Shadow Removal Challenge Report"*** and ***"NTIRE 2024 Dense and Non-Homogeneous Dehazing Challenge Report",*** where we achieved notable 11th and 9th ranks (globally) respectively.

4. **"Image Annotation QC Tool"**

   In collaboration with the **CEVI-SEED (Student Ecosystem for Engineered Data) Lab**, this tool has been meticulously **developed to assess the quality of annotated images**. Leveraging the expertise of the lab, the tool serves as a valuable resource for evaluating the precision and accuracy of image annotations in diverse applications.

Technical Skills

Programming Languages: Python, C, C++, Java, MATLAB, C#, JavaScript
Frameworks: HTML, CSS3
Libraries: PyTorch, Tensorflow, Pandas, Numpy, Matplotlib, Sklearn, Scipy
Dev Tools: VSCode, Spyder, Jupyter, Git, GitHub, GIMP, Blender, Android Studio, Docker
OS: Linux, MacOS, Windows
Embedded Systems: Raspberry Pi, Arduino, 8051, ARM Cortex

Publications

Conferences

1. Ghosh, Sabyasachi, Nikhil Akalwadi, and Uma Mudenagudi. "Synthetic Radar Data Generation from RGB Images for Robotics and Autonomous Driving Applications." 2024 **International Symposium on Electronics and Telecommunications (ISETC). IEEE, 2024**. (Link)
2. Ghodesawar, Allabakash, Vinod Patil, Ankit Raichur, Swaroop Adrashyappanamath, Sampada Malagi, Nikhil Akalwadi, Chaitra Desai, Ramesh Ashok Tabib, Ujwala Patil, and Uma Mudenagudi. "DeFlare-Net: Flare Detection and Removal Network." In ***International Conference on Pattern Recognition and Machine Intelligence***, pp. 465-472. Cham: Springer Nature Switzerland, 2023. (Link)

Workshop Publications

1. Joshi, Amogh, Nikhil Akalwadi, Chinmayee Mandi, Chaitra Desai, Ramesh Ashok Tabib, Ujwala Patil, and Uma Mudenagudi. "HNN: Hierarchical Noise-Deinterlace Net Towards Image Denoising." In *Proceedings of the* ***IEEE/CVF Conference on Computer Vision and Pattern Recognition***, pp. 3007-3016. 2024. (Link)
2. Desai, Chaitra, Nikhil Akalwadi, Amogh Joshi, Sampada Malagi, Chinmayee Mandi, Ramesh Ashok Tabib, Ujwala Patil, and Uma Mudenagudi. "LightNet: Generative Model for Enhancement of Low-Light Images." In *Proceedings of the* ***IEEE/CVF International Conference on Computer Vision,*** pp. 2231-2240. 2023. (Link)

Challenge/Technical Reports

1. Vasluianu, Florin-Alexandru, Tim Seizinger, Zhuyun Zhou, Zongwei Wu, Radu Timofte, Yuanfei Bao, Xingbo Wang et al. "NTIRE 2025 ambient lighting normalization challenge report." In ***Proceedings of the Computer Vision and Pattern Recognition Conference***, pp. 1289-1300. 2025. *Top 10 Teams (ranked #9)* (Link)
2. Yang, Kangning, Jie Cai, Ling Ouyang, Florin-Alexandru Vasluianu, Radu Timofte, Jiaming Ding, Huiming Sun et al. "NTIRE 2025 challenge on single image reflection removal in the wild: Datasets, methods and results." In ***Proceedings of the Computer Vision and Pattern Recognition Conference***, pp. 1301-1311. 2025. *Top 10 Teams (ranked #5)* (Link)
3. Sun, Lei, Hang Guo, Bin Ren, Luc Van Gool, Radu Timofte, and Yawei Li. "The tenth ntire 2025 image denoising challenge report." In ***Proceedings of the Computer Vision and Pattern Recognition Conference***, pp. 1342-1369. 2025. *Top 10 Teams (ranked #9)* (Link)

4. Chen, Zheng, Zongwei Wu, Eduard Zamfir, Kai Zhang, Yulun Zhang, Radu Timofte, Xiaokang Yang et al. "Ntire 2024 challenge on image super-resolution (x4): Methods and results." In *Proceedings of the **IEEE/CVF Conference on Computer Vision and Pattern Recognition***, pp. 6108-6132. 2024. *Top 10 Teams (ranked #9)* (Link)
5. Vasluianu, Florin-Alexandru, Tim Seizinger, Zhuyun Zhou, Zongwei Wu, Cailian Chen, Radu Timofte, Wei Dong et al. "NTIRE 2024 image shadow removal challenge report." In *Proceedings of the I**EEE/CVF Conference on Computer Vision and Pattern Recognition***, pp. 6547-6570. 2024. *Top 15 Teams (ranked #11)* (Link)
6. Ancuti, Codruta O., Cosmin Ancuti, Florin-Alexandru Vasluianu, Radu Timofte, Yidi Liu, Xingbo Wang, Yurui Zhu et al. "NTIRE 2024 dense and non-homogeneous dehazing challenge report." In *Proceedings of the I**EEE/CVF Conference on Computer Vision and Pattern Recognition***, pp. 6453-6468. 2024. *Top 15 Teams (ranked #13 and #15)* (Link)
7. Ren, Bin, Yawei Li, Nancy Mehta, Radu Timofte, Hongyuan Yu, Cheng Wan, Yuxin Hong et al. "The ninth NTIRE 2024 efficient super-resolution challenge report." In *Proceedings of the **IEEE/CVF Conference on Computer Vision and Pattern Recognition***, pp. 6595-6631. 2024.
8. Dai, Yuekun, Chongyi Li, Shangchen Zhou, Ruicheng Feng, Qingpeng Zhu, Qianhui Sun, Wenxiu Sun et al. "MIPI 2023 Challenge on Nighttime Flare Removal: Methods and Results." In *Proceedings of the **IEEE/CVF Conference on Computer Vision and Pattern Recognition,*** pp. 2852-2862. 2023. *Top 10 Teams (ranked #8)* (Link)
9. Ershov, Egor, Alex Savchik, Denis Shepelev, Nikola Banić, Michael S. Brown, Radu Timofte, Karlo Koščević et al. "NTIRE 2022 challenge on night photography rendering." In *Proceedings of the **IEEE/CVF Conference on Computer Vision and Pattern Recognition,*** pp. 1287-1300. 2022. *Top 15 Teams (ranked #12)* (Link)

Posters/Extended Abstracts

1. Malagi, Sampada, Nikhil Akalwadi, Amogh Joshi, Chaitra Desai, Ramesh Ashok Tabib, Ujwala Patil, and Uma Mudenagudi. "ViD: Vision in Dark" In *the **IEEE/CVF Computer Vision and Pattern Recognition***. *Accepted as Poster*

2. Desai, Chaitra, Nikhil Akalwadi, Amogh Joshi, Sampada Malagi, Chinmayee Mandi, Ramesh Ashok Tabib, Ujwala Patil, and Uma Mudenagudi. "LightNet: Generative Model for Enhancement of Low-Light Images." In *the **IEEE/CVF Computer Vision and Pattern Recognition***. *Accepted as Poster*