Nikhil Akalwadi

Center of Excellence in Visual Intelligence
KLE Technological University

Portfolio: https://nikhilakalwadi.github.io
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Education

KLE Technological University
MS (Engg) by Research — 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 Uma Mudenagudi, Ramesh Ashok Tabib)
Undergraduate Researcher — 2020-2021
(Advised by Ramesh Ashok Tabib, Ujwala Patil)

Industry Experience

Research Assistant, **CEVI-KLETech.** — 2022-present
Computer Vision Researcher (Internship), **CEVI-KLETech.** — Jan-May 2022
Hardware Design Engineer (Internship), **Eartkey Pvt. Ltd.,** — Aug 2020-Mar 2021

Professional Activity

Reviewing
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 Modelling *@ ICML* — 2024
IEEE Transactions on Image Processing — 2024
Women in Computer Vision *@ IEEE/CVF CVPR* — 2024
Women in Computer Vision *@ IEEE/CVF ICCV* — 2023

Program Volunteer
3D Vision Summer School — 2024

Program Participant
3D Vision Summer School — 2022, 2023

Teaching and Mentorship

Teaching Assistant
AICTE ATAL Faculty Development Program, KLETech. — 2023
(Python, HandsOn Computer Vision and Machine Learning)
Summer School on Visual Intelligence, CEVI-KLETech. — 2022,2023

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

Publications

Conferences

1. 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.

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.

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.

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*

Challenge/Technical Reports

1. 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)*
2. 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* ***IEEE/CVF Conference on Computer Vision and Pattern Recognition***, pp. 6547-6570. 2024. *Top 15 Teams (ranked #11)*
3. 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* ***IEEE/CVF Conference on Computer Vision and Pattern Recognition***, pp. 6453-6468. 2024. *Top 15 Teams (ranked #13 and #15)*
4. 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.
5. 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)*
6. 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)*

Technical Skills

Programming Languages: Python, C, C++, Java, MATLAB, C#, JavaScript
Frameworks: HTML, CSS3
Libraries: PyTorch, Tensorflow, Pandas, Lumpy, 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

Projects and Research

1. **"AI-Driven Human Digitization and Scene Reconstruction for Enhanced Game Asset Generation"**

   In my latest project, under the guidance of Prof. Uma Mudenagudi, I am exploring the digitization of human NPCs (Non-Player Characters) and PCs (Player Characters) for video games. This involves advanced techniques in object and scene reconstruction and generation, aimed at creating high-quality game assets. I am also integrating AI into game asset generation to enhance the realism and interactivity of game environments. The goal is to improve game development by providing more realistic and detailed characters and environments, thereby enhancing the overall 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"**

   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.