Neeraj Nagar

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Education

University of Waterloo, Canada Sep 2023 - Aug 2025
MASc (thesis, computer software) in Electrical and Computer Engineering Waterloo, Ontario
Scholarship: Graduate research studentship, International Master's Award of Excellence (IMAE)

Indian Institute of Technology (IIT) BHU, India Jul 2016 - May 2020
Bachelor of Technology in Electronics Engineering Varanasi, India

Experience

Software Engineer, Camera Team, Samsung R&D – India Feb 2021 – Jul 2023

- Developed and optimized camera software for Samsung smartphones, focusing on image stabilization, deblurring, and macro photography. This improved user experience and elevated image quality across multiple models.
- Optimized the hyper-lapse video stabilization feature on flagship Samsung devices, delivering smoother, more stable video capture, strengthening the product's competitive edge in the market.
- Enhanced low-light photography performance by 20% by optimizing camera processing algorithms, reducing noise and improving image clarity in challenging lighting conditions, thereby boosting overall camera efficiency.
- Integrated camera firmware updates for Android 12 & 13 on Galaxy S21 and S22, ensuring compatibility and performance.

Software Engineer Intern, Samsung R&D – India May 2019 – Jul 2019

- Developed a model using OpenCV and TensorFlow to transfer style between images based on semantic categories.
- Optimized style transfer algorithms, boosting efficiency, accuracy, and ensuring high-quality output with faster processing.
- Trained a model on MIT ADE20K, optimizing 27 classes for faster segmentation and improved performance.

Publications

Methods and Systems for Enhancing an Image (Patent) 2021
Published, First Examination Report (FER) Issued Application no. 202211002117

Enhanced Adaptive Equalization based on User Behavior using Clustering (Research Paper) 2022
Published in IJACEN, Volume-10, Issue-10, DOI

System and Method for Generating a Wide Field of View Image (Patent) 2022
Published, Under Examination, Application no. 202211072053

System and Method for Frame Selection and Sensors Data Correction for Image Deblurring (Patent) 2023
Published, Under Examination, Application no. 202311044055

Enhancement of Macrophotography for Mobile Devices (Patent) 2023
Request for Examination (RQ) Filed, Application no. 202311062053

Projects

Pattern Mining of Time Series Data

- Developed a novel method to identify distinct and recurring patterns in a given time series. The primary focus of this approach is to ensure high coverage of the time series.
- Used Stumpy library to compute the matrix profile and MiniZinc framework for constraint solving.

Emergency Vehicle Detection Using YOLOv8 for Enhanced Driver Assistance

- Developed a real-time emergency vehicle detection system using YOLOv8, improving siren identification accuracy to 78%.
- Labeled and augmented 2600+ images, enhancing model robustness and real-world detection performance.
- Optimized YOLOv8 for real-time use in resource-limited environments, ensuring high-speed and efficient detection.

Autonomous Vehicle with Image Processing

- Developed an autonomous vehicle using color segmentation for object detection and Dijkstra's algorithm for optimized path planning, integrating Arduino with Python for real-time processing to improve navigation, control, and efficiency.
- Achieved a 20% reduction in route computation time, improving navigation accuracy, task efficiency, and overall system performance.

Technical Skills

Programming Languages: C, C++, Python
Machine Learning & AI Frameworks: TensorFlow, PyTorch, Keras, Scikit-learn, Stumpy, Pandas, NumPy, Matplotlib
Software Tools: MATLAB, GitHub, Jupyter Notebook, Google Colab, Visual Studio, MiniZinc (OR-Tools, Gurobi), Perforce
Certifications: Deep Learning: Image & Face Recognition, Data Structures (UCSD), Neural Networks & Deep Learning
Coursework: Algorithm Design & Analysis, Operating Systems, Machine Learning, Artificial Intelligence