



PRANAV M KOUNDINYA

+91-9108259724 ✉ email  [LinkedIn](#)  [GitHub](#)

Education

National Institute of Technology Karnataka, Surathkal
Bachelor of Technology in Electronics and Communication Engineering

2020 – 2024
CGPA - 8.77

Research Interests

Signal Processing, Image Processing, Deep Learning, Computer Vision

Experience

Project Assistant **Jan 2024 – Present**
SPECTRUM Lab, Indian Institute of Science, Bangalore

- Working on Adversarial Regularization(AR) for solving inverse imaging problems.
- Implementing data-driven approaches such as AR for biomedical imaging applications including CT reconstructions.
- Deploying the Euler-Lagrange Analysis to AR to solve for the regularizer in analytical closed-form.

Summer Research Intern **May 2023 – July 2023**
SPECTRUM Lab, Indian Institute of Science, Bangalore

- * Worked on the analysis and applications of state-of-the-art anomaly detection algorithms for industrial and biomedical applications.
- * Applied unsupervised feature-embedding-based algorithms, including PaDiM and PatchCore, and fine-tuned SAM for classification and segmentation of anomalies in industrial and biomedical images.
- * Worked on implementing the CLIP embedding backbone as a feature extractor for the Patch Distribution Modeling(PaDiM) algorithm.

Technical Skills

Relevant Coursework: Signals and Systems, Digital Signal Processing, Digital Image Processing, Pattern Recognition, Machine Learning, Optimization, Deep Learning, Compressed Sensing, Sparse Signal Processing, Digital System Design
Languages: Python, MATLAB, C, C++, Verilog, ARM Assembly, Arduino
Technologies/Frameworks: PyTorch, TensorFlow, SciPy, OpenCV

Projects

ASIC Design Implementation of FFT Algorithm | *Verilog, OpenLane* **February 2023 - April 2023**

- Worked on the Verilog implementation of 32-bit 8-point Fast Fourier Transform of digital signals.
- Worked on implementing a custom ASIC Design of the algorithm in Openlane using the Skywater 130nm Process Design Kit(PDK).

Low Light Image Enhancement using MIRNet | *Python, Tensorflow, TensorFlow Lite* **November 2022 - April 2023**

- Implemented a deep learning model to enhance images taken in low-light conditions.
- The model is based on the MIRNet architecture by Zamir. et. al(2019)
- Attempted to implement the trained model on an embedded device, the Arduino Nano 33 BLE Sense for real-time image enhancement.

Image Restoration without Denoised Priors | *Python, Tensorflow* **August 2022 - November 2022**

- Implemented a deep learning model to denoise images as formulated in the paper 'Noise2Noise' by MIT-CSAIL, nVIDIA and Aalto University.
- Trained the model of noisy data pairs instead of clean images for the ground truth values. This approach has claimed to work when the noise follows a certain distribution.
- Implemented the algorithm for two architectures- REDNet and UNet, and trained the models to denoise Gaussian and Poisson noise.

Real-Time Lane Detection for Self-Driving Cars | *Python, OpenCV* **April 2022 - July 2022**

- Deployed edge-detection techniques such as Canny Edge Detection and Hough Line Transform on each video frame to create a real-time lane detector.
- Explored Gaussian filtering to facilitate efficient edge detection.

Brain Image Analysis | *Python, TensorFlow* **November 2021 - April 2022**

- Explored the various techniques, and classification and segmentation algorithms that can be used for early detection of Alzheimer's Disease and Brain Tumour Segmentation

- Used MRI images of the brain to classify Alzheimer's Disease into early, mid and late stages using CNN architectures such as DenseNet, ResNet, InceptionNet and MobileNet.
- Segmented tumored parts of the brain to predict its severity using the UNet architecture.

Audio Fingerprinting System | *Python, Jupyter Notebook, MySQL*

Jan 2021 - June 2021

- Developed software to recognize a song from a piece of recording of audio file
- Incorporated audio processing techniques such as FFT and STFT to generate spectrograms of the audio files
- Implemented the algorithm developed by Shazam Inc. for song recognition by making use of audio fingerprints of the spectrogram peaks.

Extracurricular

IEEE NITK | *Chairperson, Signal Processing Society*

April 2023 - Present

IEEE NITK | *Secretary, Signal Processing Society*

April 2022 - April 2023

- Coordinated a team in organizing Impulse 2023 - a 24-hour signal processing hackathon.
- Participated in organizing Dishaspoorthi - an outreach event to teach the basics of electronics to school children at the NITK Kannada Medium School.

Achievements

- Successfully presented a project proposal for the launch of Atal Tinkering Laboratory in school, and was granted a funding of INR 25 Lakh by the Govt. of India in the year 2016-17
- Ranked 6854 in JEE Advanced-2020, and 8311(99.26 percentile) in JEE Main-2020