

EDUCATION

North Carolina State University, GPA:3.89

Raleigh, NC

Master of Science - Electrical Engineering

Aug 2021-May 2023(Expected)

Coursework: Computer Vision, Pattern Recognition, Neural Networks & Deep Learning, Digital Imaging systems, Probability and Random process, Robotic computer vision system for autonomous operations.

Amrita Vishwa Vidyapeetham, GPA: 3.9

Kollam, India

Bachelor of Technology - Electrical & Electronics Engineering

Jul 2015-May 2019

SKILLS

Languages: Python, MATLAB, Java, C++

Libraries and OS: TensorFlow, Pytorch, Keras, OpenCV, Numpy, Pandas, Linux, Windows, ROS, PCL, Open3D

Tools: Git, SQL, Simulink

WORK EXPERIENCE

Software Engineer, Continental AG, Bangalore, India

Oct-Jun 2021

- Coded safety critical intelligent velocity control system for Adaptive cruise control and Emergency break assist
- By Implementing Kalman filter, estimated line detection in case of shadowing, line fading & illumination changes
- Optimized the legacy code and enhanced the performance for SRR600 sensor by 20%
- Designed and developed 28 ISO26262 dynamic test scenarios for vehicle dynamics and implemented them in python
- Automated HPC simulation for multiple test environments and effectively saved approximately 300-man hours

SELECTED PROJECTS [<https://github.com/Mahathi-I>]

3D vision-based automatic welding robotic system

- Extracting point cloud information for a potential welding seam using open3D, passed 3D coordinates to a Kinova Robotic manipulator to perform welding. Explored RGBD data for joint location and performed scene segmentation using DeepLabV3
- Attached the robotic arm to a UGV to automatically navigate to welding seam location using Lidar & Orb SLAM point cloud maps

Applications of Image processing and computer vision

- Wrote convolution and image padding functions from the scratch to handle RGB images for operations like smoothening, sharpening, and blurring
- Implemented Gaussian and Laplacian pyramids using nearest-neighbor interpolation and performed image blending
- Using non-max suppression and LoG filter, performed blob detection
- Performed motion magnification and texture synthesis in videos based on phase shifts in two different frames
- Developed a Lukas-Kanade optical flow algorithm from scratch, to estimate dense motion between a pair of images
- Using ORB features in two images, developed an algorithm to perform panoramic stitching for overlapping photos
- Reconstructed 3D scene captured by a pin-hole camera using affine 3D geometry transformations
- Conducted extensive literature survey on noise reduction in images with various state-of-the-art technologies

Unsupervised optical flow estimation with temporal smoothing

- Designed an unsupervised version of the flownet-C architecture for optical flow estimation
- Formulated a temporal smoothing loss term which penalizes large changes in consecutive optical flow maps
- Generated temporarily smoother optical flow maps producing more temporally consistent warped images

Human Activity Recognition (HCR) on time series data

- Handling imbalanced terrain dataset with classes designated to directions of walking straight, upstairs, and downstairs, based on IMU sensor values from accelerometers and gyroscopes by generating synthetic samples through window warping techniques
- Trained the model on a Random Forest classifier as baseline and improved on the model performance with a Bi-LSTM and dense layers in Keras achieving F1 score of 89%

EXTRACURRICULARS

- Interned with AIESEC at Cairo, Egypt as a part of Unicorn Start-ups project in developing Battery management system for 20 prosthetic arms for handicapped people within a span of 45 days.