

NIRMAL AMIRTHALINGAM

Blacksburg, VA | +1 (262) 674-6464 | nirmal25198@gmail.com | linkedin.com/in/nirmal-amirth | github.com/nirmal-25

SUMMARY

- Motivated Computer Engineering graduate student highly adept in Python; familiar with C/C++
- Proficient in predictive modeling, data visualization, and exploratory data analysis
- Strong academic standing in Computer Vision/Image Processing; demonstrated experience in developing Deep Learning models in PyTorch and TensorFlow

EDUCATION

Virginia Tech, Blacksburg, VA

May 2023

Master of Engineering in Computer Engineering

GPA: 3.96/4

Coursework: Advanced Machine Learning, Deep Learning, Computer Vision, Data Analytics, Information Visualization

Amrita Vishwa Vidyapeetham, Coimbatore, India

June 2020

Bachelor of Technology in Electronics and Communication Engineering

GPA: 8.57/10

Coursework: Pattern Recognition, Optimization Techniques, Image Processing, Probability and Random Processes

TECHNICAL SKILLS

Programming: Python, C/C++, MATLAB, SQL, JavaScript

Frameworks/Tools: PyTorch, TensorFlow, Tableau, D3.js, AWS, Azure ML, Firebase, Flask, Postman, Docker, PostgreSQL, Git, GitLab

Libraries: OpenCV, Numpy, SciPy, Keras, Scikit-learn, Pandas, Matplotlib, Seaborn

PROFESSIONAL EXPERIENCE

Machine Learning Intern

Jun 2022 - Aug 2022

AreaProbe

Washington, DC

- Developed Catalyst - an object detection model for pedestrians and vehicles based on **YOLOv5** in PyTorch
- Deployed the model for **35 RTSP camera** feeds installed in parking lots and housing communities of the **Anacostia** neighborhood in Washington, DC
- Implemented an audio detection pipeline based on **YAMNet** (MobileNet architecture) and created a trigger mechanism to detect gunshots in real-time
- Facilitated the storage of object counts along with **color recognition for vehicles** and integrated with **gunshot detection** and deployed the model on AWS EC2 instances using Amazon SageMaker

Graduate Teaching Assistant

Aug 2021 - Present

Virginia Tech

Blacksburg, VA

- Assisted students with programming assignments and course projects in ML/CV for 3 courses – **Digital Image Processing**, **Advanced Computer Vision**, and **AI Innovation and Machine Learning**

ACADEMIC PROJECTS

Document Parsing for Electronic Theses & Dissertations (ETDs)

Aug 2022 - Dec 2022

- Developed an end-to-end object detection pipeline for **information extraction** from **Virginia Tech's ETD** repository
- Used **YOLOv7** and **Faster R-CNN (Detectron2)** algorithms to extract text and image objects from ETDs
- Implemented post-processing rules to filter detections and parse information to a structured format and developed read/write APIs to interact with the database in **PostgreSQL**
- Integrated the model with an **information retrieval and search** system that supports up to **50k ETDs** by providing **Dockerized** services with **CI/CD** capabilities

Hierarchical Multitask Learning in Non-Euclidean Space

Mar 2022 - Apr 2022

- Developed **few-shot** image classification models for **Omniglot** and **mini-ImageNet** datasets using Non-Euclidean manifolds, and evaluated using **Stiefel**, **Hyperbolic** and **Riemannian** optimizers for faster convergence
- Achieved an improvement in test accuracy by **3%** using Hyperbolic models for 5-way 5-shot learning task on Omniglot

Advanced Driver Assistance Systems (ADAS)

June 2019 - Mar 2020

- Developed an accurate Faster R-CNN + ResNet-101 model in TensorFlow for the **Bosch Small Traffic Light** and **TT100K Traffic Sign** datasets using background thresholding for training different datasets with overlapping instances
- Implemented a joint training pipeline for traffic light, traffic sign detection and car distance estimation using **3 datasets** consisting of over **50 classes** which led to **better qualitative results**

PUBLICATIONS

- Evaluating the Scalability of a Multi-Object Detector Trained with Multiple Datasets May 2021
- A Combined Wavelet and Variational Mode Decomposition Approach for Denoising Textured Images Dec 2020
- A Comparative Study between State-of-the-Art Object Detectors for Traffic Light Detection Feb 2020