Alekhya Duba

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Education

Texas A&M University, College Station — **Aug. 2021 – May. 2023**
*M.S. in Computer Engineering (CSE Dept) (**CGPA- 3.66/4**)* — *College Station, TX, USA*

Indian Institute of Science — **Jan. 2020 – May. 2020**
CCE- Proficiency in Machine Learning and Reinforcement Learning — *Bengaluru, KA, India*

Bhilai Institute of Technology, Durg — **Aug. 2010 – Aug. 2014**
*B.E. in Electrical and Electronics Engineering **(CGPA- 9.26)*** — *Drug, CG, India*

Technical Skills

Languages: Python, C#, SQL
Developer Tools: PyCharm, Visual studio, Jupyter, GitHub, TFS
Machine Learning Libraries: Numpy, Pandas, Keras, PyTorch, TensorFlow

Projects

Auto Drive Challenge — **Oct. 2021 – Present**
Perception, Computer Vision, YOLO, OpenCV — *NetBot Labs*

- Experimenting to find efficient ways to enable an autonomous vehicle to detect the speed signs in real time accurately.
- Identify the speed sign and read the speed limit and pass the information to the system.

Fast Traffic Light Detection and State Classification — **Oct. 2021 – Dec. 2021**
Computer Vision, YOLO, CNNs, OpenCV, Darknet — *Robotics and Spatial Intelligence*

- Used Bosch traffic light dataset to train a YOLOV4 framework to detect and classify **8** traffic light states for traffic light signal sizes as small as **20x20 pixels** and tried different data augmentation techniques for robust model training.
- Created a pipeline to extract **11k** bounding boxes from the Bosch dataset using the YOLOv4 Darknet framework, crop and match the bounding boxes with the ground truth, to feed into a classification model that gave **91%** accuracy.
- The CNN classifier on cropped images outperformed YOLOv4 classification accuracy by **10%** and was **15%** faster.

Maximum Bandwidth Path - Graph Theory — **Nov. 2021 – Dec. 2021**
Graph Theory, Kruskals, Dijkstra, Heaps, Object Oriented Program (OOPs) — *Algorithms and Analysis*

- Engineered a class to simulate random dense graphs representing real-world networks with user-defined density. It can generate a graph of **5000** nodes with **1000** as the average degree of vertices to simulate a dense network, within **8secs**.
- Implemented a custom Priority Queue using Max Heap with operations having **O(log n)** time complexity. This was used to determine Max Bandwidth Path in Dense and Sparse graphs using large-scale Dijkstra and Kruskals algorithms.

AdaBoost with CNNs for Class Imbalance in multi class dataset — **Nov. 2021 – Dec. 2021**
AdaBoost, CNN, Keras, Tensorflow, CIFAR-10 — *Pattern Recognition*

- Developed a method to extract imbalanced sub dataset from a given balanced dataset for realistic tests.
- Implemented AdaBoost with CNNs as the base classifiers and compared the results with a single CNN network.
- Analyzed the observations of AdaBoost with CNN's performance specifically for imbalanced multi class dataset.

Experience

Siemens Advanta — **May. 2017 – Jun. 2021**
Senior Software Engineer | Test Owner, Test Automation, C# — *Bengaluru, KA, India*

- Led a team of **3** manual and automation testers to test an intricate innovation line SCADA sub system.
- Designed and developed sub framework for test automation and delivered automated projects for new user stories.
- Collaborated with **3** scrum teams for cross platform testing and reduced production issues by **33%**.

Awards and Recognition

- **Fellowship scholarship award** for 2021-2022 from CSE department at *Texas A&M University, College Station, TX.*
- **Key player award** for quick learning and providing outstanding contributions in creating TA user stories. *(Siemens).*
- **SPOT award** for Out-of-Box thinking skills and reporting critical defects. *(Siemens).*
- **Merit Award** for 8th Rank (EEE discipline). *CSVTU*