Devadharshini Ayyappan

+1(984)-683-3370 | dayyapp@ncsu.edu | www.linkedin.com/in/devadharshini-ayyappan | https://github.com/devadharshini97

EDUCATION

North Carolina State University, Raleigh, NC — Aug2022 - May 2024 (Anticipated)
Masters, Electrical Engineering — GPA: 4 / 4
Anna University, Chennai, India — Aug 2015 - May 2019
Bachelors, Electronics and Communications Engineering — CGPA: 8.94 / 10

WORK EXPERIENCE

ARoS Lab - NC State University, *Research Assistant (3D Computer Vision)*, Raleigh, NC **April 2023 - Present**

- Collaborated on research involving innovative DL-driven algorithms, merging **structure from motion**, NeRF, and **bundle adjustment** using COLMAP and NeRFStudio to reconstruct 3D objects with **perspective geometry**.
- Achieving high-fidelity point clouds design from 2D plant images, enabling accurate extraction of complex structural parameters emphasizing synthetic images from unreal engines to advance plant phenotyping.
- Successfully executed 3D reconstruction for microscopic images of foraminifera using NeRF technology.
- Currently working on enhancing 3D reconstructions by **optimizing camera parameters** without relying on COLMAP and minimizing photometric errors for superior reconstruction outcomes.

EcoPRT Lab – NC State University, *Graduate Lab Assistant*, Raleigh, NC **August 2023 - Present**

- Utilizing **3D MMDetection** and **PointNet++** to advance the development of an autonomous campus vehicle for robust **detection** and classification tasks using the **Stereo** and **Lidar** data for V2X applications.
- Spearheading efforts to enhance inference efficiency through the utilization of **TensorRT** on **Nvidia GPUs**.

USDA ARS Western Regional Research Center, *AI / Data Science Research Intern*, Albany, CA **May 2023 - July 2023**

- Leveraged **Langchain** and **LLM**s to optimize the database structure and enhance data accessibility and insights in pan-genome database dashboard for wheat, barley, rye, and oat crops created using Drupal and **PostgreSQL**.
- Applied ML/AI techniques to analyze genome signals and develop advanced querying strategies, contributing to a deeper understanding and interpretation of genomic data.

NC State University, *Graduate Teaching Assistant*, Raleigh, NC **Jan 2023 – May 2023**

- Worked under Dr. Wong for ECE 301 Signal Processing in preparing assignments, exams, discussions and grading.

Robert Bosch, *Software Engineer*, Coimbatore, India **Sept 2019 – July 2022**

- Engineered **automated** software analyzer processes, boosting efficiency by **30**% through streamlined integration.
- Managed the developmental and testing phases of powertrain **embedded software** functional components for 12V gasoline systems to ensure robust software quality. Fostered seamless **cross-team collaboration** for timely deliverables.
- Integrated intricate software modules and executed comprehensive pre-delivery checks for Daimler ECUs and proficiently conducted System level Tests in HIL LABCARs, affirming software robustness and performance.
- **Led** the onboarding of freshers into the **SDLC**, **CI/CD** practices and coordinated cross-functional knowledge sharing.

SELECTED PROJECTS

Deepfake Detection Model | Tensorflow | XceptionNet | LSTM | Metric Learning | Deep Learning

- Devised **MTCNNs/LSTMs** achieving 92% real vs. fake video accuracy, 94% for DC**GAN**-made fake images. Enhanced accuracy by 10% on low-res videos via metric learning.

3D Tumor Segmentation | U-netR| ViT| Monai| PyTorch | Matplotlib| itkwidgets | Open3D

- Implemented 3D tumor segmentation using **UnetR** architecture, a combination of **ViT** and Unet, to improve localization of tumor classes and visualized and rendered the predictions in 3D.

CVAE Image Morphing | Pytorch | Scikit-learn| PIL | Matplotlib | NumPy | Neural Networks

- Developed and trained a **CVAE** model using the Celeb-A dataset to encode and manipulate images. Implemented image morphing by generating new samples through the linear interpolation of latent mean vectors extracted.

Credit Card Fraud Detection System | PyTorch | Seaborn | Pandas | NumPy | Machine Learning

- Created the system using **Smote** and **Adasyn** resampling techniques to balance data and implemented Random Forest, DNN and regression techniques for detection and evaluated performance using **F1 Score** and **AUC**.

SKILLS

Languages	**:**	Python, MATLAB, C++, Embedded C, SQL
Frameworks	**:**	OpenCV, Numpy, Open3D, Pandas, Keras, Pytorch, Tensorflow, XGBoost, Scikit-learn, Matplotlib
Software Tools	**:**	Jira, Blender, AUTODESK, ASCET, Git, GitHub, Drupal, Docker, EKS (Kubernetes), AWS, Linux

PUBLICATIONS

- Authored a research paper **"**Statistical Approach For The Development Of Driving Support System Based On Pixel Classification Algorithm**"** which is published in **International Journal of Applied Engineering Research (Nov 2019)**