CHARAN KUMAR SELVAM

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TECHNICAL SKILLS

Coding Languages: C, C++, C#, CUDA C++, JavaScript, Python
Libraries: PyTorch, Pytorch Lightning, PyTorch3D, Kaolin, Diffusers, NumPy, SciPy, Pandas, PySpark, Matplotlib, Keras, Scikit-Learn, Open3D, OpenGL, OpenCV, FastAPI, Flask, PyTest
Databases: SQL, PostgreSQL, InfluxDBv2
Tools and Frameworks: LangChain, LangSmith, Dockers, WandB, Unity, Blender, Grafana, Git, AWS Sagemaker
Cloud Technologies: Amazon AWS, Microsoft Azure
Relevant Skills and Courses: Machine Learning, Deep Learning, Computer Vision, Generative AI/LLM, Image Processing, 3D Processing, Data Structures and Algorithms

EXPERIENCE

Hypothetic **May 2023 – Jan 2024**
ML Research Intern (3D Computer Vision Focus) *Vancouver, Canada*

- Worked on a research project aimed at developing and fine-tuning a **Deep Neural Network** architecture for predicting **Topological features** like Vertices, Edges, and Faces of 3D models.
- Developed a Deep Learning model leveraging diverse modalities to predict 3D model orientations with a **97%** accuracy. Further, developed a **Dockerized API** integrating the model in **ONNX** format for CPU deployment.
- Enhanced a 3D alignment model by reducing intermediate **VGG-16** embedding size used for alignment correction, and reduced processing time by **40%** thereby improving efficiency and overall performance.

Extreme Networks **Aug 2019 – Aug 2022**
Associate Software Engineer *Bengaluru, India*

- Contributed to the development to integrate **6GHz** band(**Wi-Fi 6E**) support into modules within WingOS, for deployment on Access Points and Controllers. Also supported maintenance and resolved Customer-reported Defects.
- Played a key role in the development of **WIPS** feature aimed at termination of **WPA3** connections using Role-based Firewalls.
- Enhanced **SNMP** operations by implementing caches to expedite bulk response time when paired up with intensive network monitoring tools like **Statseeker**.
- Supported Synthetic NICs on **Cloud Controllers** when deployed on **Microsoft Azure** and **Hyper-V** instances.
- Designed and Prototyped an **pipeline** to harvest **network statistics** from APs and transmit them to InfluxDB using **Telegraf** for comprehensive real-time Network monitoring.

Renovus Vision Automation **Dec 2018 – Mar 2019**
ML Research Intern *Bengaluru, India*

- Integrating **Object Detection(YOLO)** algorithms for high-speed quality inspections, resulting in an **18%** reduction in processing time.
- Conducted research and survey on techniques for inspecting **3D Point Cloud** data and **defect detection**, inorder to overcoming occlusion and depth estimation challenges in 2D imagery.
- Developed a system to **estimate dimensions** of objects using Point Clouds after **PointNet++** Part Segmentation. Also gathered the Point Cloud Data, Labelled, and **Augmented** 3D data for training.

PROJECTS

CUDA Image PreProcessing | *CUDA C++* **June 2023**

- Implemented a few basic Image processing methods like edge detection, Gaussian blurring on **GPU using CUDA**.

StyleGAN Latent Vector Interpolation for Facial expression Editing | *Python, PyTorch, SVM* **Apr 2023**

- Identified an **SVM** Hyperplane in StyleGAN's Latent Vector feature Space separating Facial Expressions.
- Performed **latent vector interpolation** across hyperplane to modify facial expressions while preserving facial features.

Point Cloud Compass | *C++, OpenGL* **July 2019**

- Developed a software system capable of visualizing Point Clouds, enabling **user-directed** navigation over its surface and accurately estimating dimensions of the 3D object.

Staging Diabetic Retinopathy(DR) using Retinal Images | *Python, OpenCV, K-NN* **Apr 2019**

- Designed a classifier model to assess DR severity from retinal images using Neural architecture and Image Processing achieving **94%** accuracy.

EDUCATION

M.Sc., Professional Computer Science - Visual Computing **Sep. 2022 – Apr. 2024**
Simon Fraser University *Burnaby, BC Canada*

B.E. in Information Science and Engineering **Jul. 2015 – Aug. 2019**
PES University *Bangalore, Karnataka, India*