AMAN WAOO

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EDUCATION

North Carolina State University, Raleigh — **Aug 2022 – May 2024 (anticipated)**

Master of Science, Electrical and Computer Engineering — *GPA – 4.0/4.0*

Coursework: Computer Vision, Pattern Recognition, Digital Imaging Systems, Advanced Machine Learning, Automated Learning and Data Analysis, Data Science, Neural Networks and Deep Learning, Mechatronics, Object Oriented Design and Development

National Institute of Technology Bhopal, India (NIT-B) — **Jul 2016 – Jun 2020**

Bachelor of Technology, Electrical Engineering — *GPA – 7.9/10*

Coursework: OOP in C++, MATLAB, Modern Control Systems, Digital Signal Processing, Electrical Measurement and Instrumentation, Industrial Electronics

TECHNICAL SKILLS

Programming Languages: Python, SQL, C++, MATLAB, R Programming, HTML5, CSS, JavaScript

Frameworks & Libraries: PyTorch, TensorFlow, Keras, OpenCV, scikit-image, scikit-learn, Pandas, Seaborn, Matplotlib, NumPy

OS & Tools: Linux (Ubuntu), PowerBI, Roboflow, Dataiku DSS, JMP, ROS, Git, Docker, Kubernetes, REST API, Jupyter Notebook, Trello, Agile/Scrum Methodology

Miscellaneous: Experienced in statistical analysis and conveying narratives through data visualization. Knowledge of machine learning concepts, computer vision algorithms and strong mathematical skills in statistics, probability theory, and geometry.

PROFESSIONAL AND RESEARCH EXPERIENCE

ML Research Intern — **Oct 2023 – Present**

Sozzani Lab NCSU — *Raleigh, North Carolina*

- Spearheaded the development of **CNN and BiLSTM** models, while demonstrating resilience against data overfitting. Achieved robust performance in predicting transcriptional Activation Domains (ADs) within Arabidopsis gene expression, surpassing established benchmarks.
- Initiated ongoing Exploratory Data Analysis (**EDA**) on **50,000+** diverse protein sequences and genomic data samples using SQL and Python. Effectively communicated the efficacy of generated models through data-based results (**Explainable AI**).
- Contributed to the research paper-style documentation (**publication in-review**), outlining used algorithms and learning methodologies.

Data Science Intern — **May 2023 – Aug 2023**

Schlumberger Limited (SLB) — *Houston, Texas*

- Improved predictive maintenance workflows for Remaining Useful Life (**RUL**) of electronic sensor boards on oil drilling tools, by implementing **classical machine learning models** (XGBoost, Random Forest, GBM) with exceptional accuracy and recall scores of approximately **92%.**
- Enhanced dataset balancing using **SMOTE** oversampling and Generative Adversarial Network (**GAN**). Leveraged advanced statistical features (histograms, quantiles, probability mass function) to integrate **data-driven insights** with domain knowledge.
- Applied **clustering and processing techniques**, such as K-means, Interactive Clustering, and Anomaly Detection, to analyze datasets from **1,500+** electronic channels. This effort identified meaningful correlations across these channels, contributing to improved decision-making.

Research Volunteer — **Feb 2023 – May 2023**

EcoPRT NCSU — *Raleigh, North Carolina*

- Assisted in implementation of **PointPillar** feature encoder for 3-D object classification and segmentation, employing training using **LiDAR point clouds** and photogrammetry. Hands-on experience with **ZED camera** and ROS within the autonomous vehicle research group.
- Helped in developing a classification system with the **PointNet++** architecture and comparing the performance with PointNet model for runtime optimization.

System Engineer — **Aug 2020 – May 2022**

Larsen & Toubro Limited (L&T) — *Vadodara, India*

- Utilized data analysis and visualization techniques using **RStudio and PowerBI** to conduct relay coordination studies. Identified and implemented optimal protective configuration settings in thermal power plants using **PLCs**, resulting in a substantial **30% reduction** in operational downtime.
- Orchestrated seamless collaboration with **cross-functional teams** spanning various engineering departments, and with third-party suppliers. Coordinated Factory Acceptance Tests (**FAT**) for various customers. Implemented data-driven optimizations, yielding substantial **cost savings** across **6 unique projects** in India.
- Facilitated the creation of **automatic sizing and calculation sheets** for electrical and instrumentation packages such as UPS battery packs, plant illumination, switchgears, and SCADA, lowering the potential for human error. Additionally, conducted **root cause analysis** for failures in electrical and mechanical systems.
- Demonstrated proficient **leadership** skills to guide and mentor prospective hires of engineering and procurement departments.

ACADEMIC PROJECTS

- **Deep Learning – Deepfake Images Detection Algorithm** | Python (PyTorch, sklearn) — **Feb 2023 – May 2023**
  - Generated **120,000** fake images from CelebA real images dataset for different **GANs** (DCGAN, PGGAN, WGANs) and trained a combined **Siamese Network** (Common Fake Feature Network + Classification Network) for fake/real images annotations.
  - Utilized **CUDA High Performance Computing** to expedite model training and achieved impressive accuracy of 99.37% and recall of 99.31%.
- **Machine Learning – 2-D Object Detection for Autonomous Vehicle** | Python (TensorFlow, Keras) — **Jan 2023 – Feb 2023**
  - Trained **YOLOv3** model with DarkNet-53 architecture as codebase and for MSCOCO dataset with **10,000+** car dashcam images.
  - Surpassed model performance over other algorithms in terms of Frames Per Second **(FPS)** and mean Average Precision **(mAP)** scores.
- **Computer Vision – SIFT Key Descriptor – Blob Detection in Images** | MATLAB — **Nov 2022 – Dec 2022**
  - Engineered frequency domain filtering in images from scratch, to speed up the process of convolution to mere **20 milliseconds**.
  - Constructed Laplacian scale space for multiple images and implemented **Harris' Non-Max Suppression** for effective blob detection.
- **Mechatronics – EV3 Robot for Path Tracking, Platooning and Parking** | MATLAB — **Oct 2022 – Dec 2022**
  - Designed and built EV3 robot featuring in-house developed **color and ultrasonic sensors**, attaining 95% accuracy in path tracking and 98% in parking.
  - Implemented **PID controller** to compute error signals with a precision rate of 99%, significantly improving the bot's functionality and efficiency.

CERTIFICATIONS AND EXTRACURRICULARS

- Secured 3rd place in the Machine Learning track at the annual N.C. PSI **Hackathon** as a member of team of four students.
- Dataiku DSS – "Machine Learning Practitioner", "Core Designer", NVIDIA – "Deep Learning Fundamentals", "Image Segmentation Techniques"
- Vice Chairperson (Administration) – IEEE MANIT Student Branch – Won **Darrel Chong Activity Award** (Gold Category).