DHRUV NARAYAN

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EDUCATION

NORTHWESTERN UNIVERSITY — Evanston, IL, USA
Master of Science – Artificial Intelligence — CGPA: **4.0/4.0** — Sep 2021 – Jan 2023
Coursework: Machine Learning, Data Science, Advanced Deep Learning, Natural Language Processing, Computer Vision

VELLORE INSTITUTE OF TECHNOLOGY — Vellore, India
Bachelor of Technology – Electronics & Communication Engineering — CGPA: **8.61/10** — Jul 2014 – Jun 2018

MOOCs: Udacity- ML Nanodegree, Coursera- Machine Learning, Deeplearning.ai, Codecademy- Intro to Data Analysis with Python

PROFESSIONAL EXPERIENCE

Company: **WIPRO TECHNOLOGIES** — Bangalore, Karnataka, India
Position: *Software Engineer* — July 2018 – Apr 2021
Major Projects:

- **Anomaly Detection using Unsupervised ML on AWS**
  - Research on unsupervised ML algorithms (Open-source and Commercial) to predict anomalies in time-series data
  - Responsible for entire project development of Data Science pipeline and deployment on AWS platform for customer
  - Key experience navigating Machine Learning projects on AWS SageMaker and Cloud Artifacts – S3, Kinesis, Lambda, EC2
- **Autonomous Valet Parking (AVP)**
  - Research on Computer Vision application – Deep Learning algorithms for Last Mile Autonomous Parking Perception Module
  - Designed the Software Requirements document for Autonomous Valet Parking project
- **ADAS Self Driving Car (Computer Vision Team)**
  - Worked for the Computer Vision / AI team for customer focussed on Python, Image Processing (OpenCV) and Deep Learning
  - Applied Deep Learning Algorithms using Caffe and PyTorch to implement CNNs (derived from Pelee SSD and Spatial CNN)
  - Worked with C++ code for deployment of Perception Algorithms – Object Detection, Lane Line Segmentation
  - Received *Wipro Pragati Award* twice for bringing innovation in execution of the project

ACADEMIC PROJECTS

Project 1: **Weather Classifier / Storm Detection System for AWS Hackathon @ Northwestern**
- Developed and compared performance of Deep CNN based Networks for the task of weather classification (4 output classes)
- Worked on Data Gathering, Image Pre-processing, Creating Models leveraging Transfer Learning, Optimization to improve Accuracy and Recall. Developed in Keras. Best model (derived from InceptionV3) had Test Accuracy – **93.75**%

Project 2: **Identifying Customer Segments with Unsupervised Machine Learning Algorithms**
- Applied unsupervised ML techniques like *K-Means* clustering algorithm and PCA (ensuring *Explained Variance Ratio* of **86.2%**) to identify segments of the population data that form the core customer base for a mail-order sales company
- Performed Data Cleaning, Feature Selection, tested customer data on the trained model to identify segments and performed inverse PCA to identify the relationships between members of the same cluster

Project 3: **Development of an Image Classifier using Deep Learning with PyTorch**
- Experimented with different hyperparameters and regularization techniques – Data Normalization, Data Augmentation, Batch Normalization, Dropout Regularization, Gradient Optimization Algorithms – SGD, Batch GD, ADAM
- Model received Test Accuracy of **74.2%** on a dataset with 100 classes (target feature)

Project 4: **Develop a Supervised ML model to Predict Annual Income**
- Implemented supervised learning ML Algorithms – *Logistic Regression, AdaBoost Ensemble and Gradient Boosting Ensemble* to accurately model individuals' income using data collected from the 1994 U.S. Census
- For optimization, ran a Grid Search on hyperparameters like learning rate, number of estimators and max depth of the estimator and selected the most suitable model for prediction (Gradient Boosting Ensemble)
- Explored the feature importance in the best estimator to get an idea of which features best describe our target (income)

ADDITIONAL INFORMATION

Skills: Python (Scikit-Learn, NumPy, Pandas, Matplotlib, SciPy), C++, SQL, Machine Learning, Deep Learning Tools (PyTorch, TensorFlow, Keras, Caffe), AWS Cloud ML, Git, Docker

Research Paper: *Co-Author,* **DWT based Audio Encryption Scheme** Published in 2018 *Second* **Institute of Electrical and Electronics Engineers (IEEE),** *International Conference on Electronics, Communication and Aerospace Technology* (ICECA)

Work Eligibility: Eligible to work in the U.S.; will require Visa Sponsorship