

ADARSH PURI

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EDUCATION

North Carolina State University

Aug 2019 - May 2021

Master of Science in Electrical Engineering

GPA: 3.93/4.00

Course Work: Computer Vision, Pattern Recognition & Machine Learning, Neural Networks, Mechatronics, Random Processes, Algorithms & Optimization, Automated Learning & Data Analysis, Computer Networks, Experimental Statistics, Image Systems

National Institute of Technology, Kurukshetra, India

Jul 2012 - Jun 2016

Bachelor of Technology in Electronics & Communication Engineering

GPA: 4.00/4.00

TECHNICAL SKILLS

Proficient with: C++, MATLAB, Python (OpenCV, Pandas, Scikit-Learn, Numpy, Seaborn), SQL, Keras, PyTorch, Fast.ai, Decision Trees, CNNs, RNNs, LSTM, GANs, XGBoost, SVM, PointNets, Clustering, Prediction, Classification, Simulink, Auto-Encoders, Supervised and Unsupervised Learning, TensorFlow, CUDA, PowerBI, LaTeX, Welch's t-test, Time Series Modelling, GCP

Miscellaneous: Strong Mathematical Background (Probability theory, Linear Algebra, Statistics, Vector Calculus), Graph Theory, DS

EXPERIENCES AND INTERNSHIPS

Sozzani Lab (Plant & Microbial Biology), NC State University (Machine Learning Research Assistant)

April 2021 - Present

- Collaborating with a team of Biologists to design, train and deploy a machine learning model into production to predict the binding relationship between Transcription Factors and Genome Sequences.

EcoPRT Lab (Autonomous Driving), NC State University, Raleigh (Graduate Research Assistant)

Jan 2020 – March 2021

- Worked on the PointNet implementation for Object Detection and Classification in Autonomous Driving using Pointpillars, outperforming the VOXELNET and YOLO models in speed and accuracy by 5-10% in different scenarios.

Tata Motors Limited, India (Senior Manager-Automation Engineer)

Aug 2016 - Dec 2017

- Managed a team of 10 members and 3 summer interns that installed the First Digital Picking System at the kitting area using Mitsubishi PLCs and AIOI's controllers with MES integration leading to its plant level implementation.
- Upgraded and tuned the PID microcontroller and its integration with Siemens PLCs throughout the plant sites to reduce process cycle time and throughput time by 12.48%.

ACADEMIC PROJECTS

Quora Question Pair Classification (Natural Language Processing Models) | TensorFlow

Aug 2020 - Oct 2020

- Explored a data mining problem using the Kaggle Dataset by pre-processing the data and performing the Feature extraction obtaining features like Bag of words, n-grams, TF-IDF, Word2Vec and Glove Embeddings.
- Classified the duplicate question pairs on these features, using the Multinomial Bayes, Logistic Regression, XGBoost, LSTM, TD-CNN Statistical Models, reaching the best testing accuracy of 83%.

Leaf Wilting Detection in Soybean | Python, Keras, FastAI

Jan 2020 - Apr 2020

- Build a Deep Convolutional Neural network using transfer learning approach with FastAI and Resnet-50 to predict the leaf wilting, preventing further crop failure getting a test accuracy of 59.88%
- Performed data augmentation using SMOTE for Imbalanced data, improving accuracy by 20%

Face Classification- Statistical Modelling, Viola Jones Algorithm and CNN | Pytorch

Jan 2020 - Apr 2020

- Prepared the dataset (subset of WiderFace Dataset) by parsing annotations and cropping considering the IoU.
- Build and compared the performance of Single Gaussian, Mixture of Gaussian, t-Distribution, Mixture of t-Distribution, Factor Analyzer and Mixture of Factor Analyzer based on ROC curve, Classification rates, accuracy (70-90%), F1 score.
- Implemented the Viola Jones algorithm from scratch by extracting Haar features and observed performance by varying the number of weak classifiers in the ensemble. Got 97.60% testing accuracy on the data.
- Further build a feed forward CNN based LeNet5 architecture reaching accuracy of 98.79%.

Trained a Multilayer Perceptron (MLP) for digit recognition using the MNIST dataset | Python

Jan 2020

- Trained the network with 3,000 samples in training, 10,000 samples in validation and 10,000 samples in testing.
- Modified Hyperparameters and recorded the Validation and training loss values and accuracy values.

SIFT Key Descriptor- Blob detection in images | Python

Nov 2019

- Constructed a Laplacian Scale space by varying image size which helped increase the speed, and Harris' Non-Max Suppression for blob detection to highlight the key points(blobs) with circles of corresponding radii.
- Implemented a frequency domain filtering for the images from scratch to speed up convolution to 0.016 milliseconds.

Monte Carlo Simulator | Python

Sep 2019

- Designed a Monte Carlo Simulator for Bit Error Rate Estimation, learned the method of calculating confidence interval.

Compute shortest route between two cities in North Carolina | Python

Aug 2019

- Assuming pixel values in an Image matrix to represent each city, utilized OpenCV and python to execute A* algorithm for finding shortest route, where any pixel intensity value other than that of the road was considered an obstacle.

Energy efficient clustering (EC) solution for Wireless Sensor Networks | MATLAB

Oct 2015

- Modified the EC algorithm improving the efficacy by 10%, comparing the performance of EC clustering algorithm with HEED and UCR.