AAYUSH MANDHYAN

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Education

Rutgers University, New Brunswick **September 2018 – May 2020**

- **Master of Science** in **Data Science**, CGPA – 3.75/4
- **Relevant Coursework:** Machine Learning, Reinforcement Learning, Introduction to Artificial Intelligence, Data Interaction and Visual Analytics, Massive Data Storage and Retrieval, Probability and Statistical Inference.

SRM University, NCR Campus, Ghaziabad, India **August 2012 – May 2016**

- **Bachelor of technology** in **Computer Science and Engineering,** CGPA – 8/10

Skills

- **Algorithms**: Q-Learning, Neural Networks, LSTM, RNN, CNN, Auto-Encoders, XGBoost, SVM, Random Forest, Decision Trees, Logistic Regression, Lasso Regression, Ridge Regression, KNN, etc.
- **Languages**: Python, R, Java, HTML, JavaScript
- **Libraries**: TensorFlow, PyTorch, Keras, Scikit-learn, XGBoost, NumPy, Pandas, Matplotlib, CuPy, Numba, OpenCV, PySpark, NLTK, Gensim, Flask, R Shiny.
- **Tools**: MySQL, NoSQL, MongoDB, REST API, Linux, Git, Jupyter, AWS, GCP, Openstack, Docker.
- **Technologies**: Deep Learning, Reinforcement Learning, Machine Learning, Computer Vision, Natural Language Processing, Time Series Analytics, Data Mining, Data Analysis, Predictive Modelling.

Work Experience

Exafluence Inc., Data Scientist Intern **February 2020 – May 2020**

- **Anomaly Detection System** (*Anomaly Detection, Python, KMeans, One-C SVM, GMM, R Shiny*)**:**
  - Designed and built Anomaly Detection ML Model using KMeans to achieve 0.9 F1 Score.
  - Implemented Deep Auto-Encoder Gaussian Mixture Model using TensorFlow from scratch (paper).
  - Designed and Developed a demo application in RShiny - Demo

Rutgers University, Research Intern **May 2019 – September 2019**

- **Adaptive Real Time Machine Learning Platform** - ARTML (*Python, CUDA, TensorFlow, CuPy, Numba, PyTorch*)**:**
  - Designed and Built GPU modules for ARTML using CuPy library, with 50% performance boost over CPU modules.
  - Optimized CPU modules by leveraging Vectorization technique to achieve performance improvement by 90%.
  - Benchmarked computation performance of GPU modules created using TensorFlow, CuPy, Numba and PyTorch.

Cognizant, Programmer Analyst **August 2016 – May 2018**

- **Openstack Cloud Platform** (*Cloud Computing, IAAS, Time Series Analytics, Python, ARIMA, Linux Servers*):
  - Deployed, Troubleshooted, Maintained & Administered OpenStack cloud platform on Linux servers at Cognizant DC's.
  - Created a **Time Series Model** using ARIMA to predict future resource requirement of Openstack Cloud, based on 1.5-year usage pattern. Resulting in addition of another 20% compute resource to existing Cloud platform.
- **Video Analytics** (*Python, OpenCV, SIFT, Object Detection, Object Tracking*):
  - Built a Python module to reduce frame count of a video by 99% using Brute-Force Matching with SIFT Descriptors in OpenCV
  - Built **Object detection** & **Object tracking** system which took an image (object/person) and track their time in each video.

Academic Projects

Stock Trading Agent - Repo (*Reinforcement Learning, Python, TensorFlow, Q-Learning, Time Series Analytics*)**:**

- Trained Stock Trading Agent using Reinforcement Learning (Q-Learning) on simulated stock data using GBM to perform profitable trades, which earned average of $5k profit on $10k investment on 100 evaluation runs.
- Implemented various combination of Deep Q-Learning Network (DQN), Double DQN, Actor-Critic DQN, Replay Memory DQN with Deep Neural Network and CNN's (as DQN architecture) to build trading agents.

Bank Transaction Categorizer, Industrial Project (*Python, XGBoost Classifier, NLP, Flask Web Framework, GCP*)**:**

- Built an ensemble classification model based on XGBoost to achieve 90% accuracy on categorizing bank transactions. Built a Python base full-stack web application to provide an interface to the user. Leveraged various **NLP**-techniques to incorporate ~95000 description tokens as 17 feature input to ML models.

Airbnb Visual Analytics System - Demo (*R, R Shiny, Plotly, Leaflet*)**:**

- Designed and Developed Geospatial Interactive & Visual Analytical Platform using RShiny, to visualize Airbnb listings in a hierarchical clustered fashion.

Amazon Digital Music Recommendation System (*Python, Recommendation System, Collaborative Filtering, KNN*):

- Built a recommendation engine to predict product rating by a user, by leveraging KNN model with 0.44 MAE and 0.72 RMSE. Then recommending top products to the new user using KNN classification model.

Colgate Product Price Prediction - Repo (*Python, XGBoost Regressor, NLP*)**:**

- Built XGBoost regressor model to predict unit price based on location, brand and ingredients. Reduce feature set from ~10000 to 50 and achieved 1.38 MAE. Also, used NLP techniques to incorporate 9000 ingredients as 30 feature input to the model.

Certifications & Awards

- Won **Colgate Data Set challenge** at HackRU Fall 2019 (Rutgers Hackathon – Devpost) **October 2019**
- **Deep Learning** Specialization on Coursera. **July 2018**
- Rising Star of the year (Top 10 performer in batch of 6000 Cognizant recruits in 2016). **February 2017**