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Arsal Syed

Education

Sept '17 - July '21 **PhD**, Electrical Engineering, University Of Nevada Las Vegas (UNLV).
Jan '14 - Dec '15 **MS**, Electrical Engineering, New York Institute of Technology (NYIT).
Aug '08 - July '12 **BS**, Engineering Science, Ghulam Ishaq Khan Institute (GIKI), Pakistan.

Skills

ML/DL: RNN/LSTM, GAN, VAE, Transformers, Logistic Regression, Random Forest
Computer Vision: Semantic Segmentation (SegNet, PSP-Net), Object Detection (Yolo, RCNN)
Programming: Python(Tensorflow, Keras, Pytorch, Scikit-Learn), Matlab, R
Autonomous Vehicle Datasets: CamVid, Cityscapes, NuScenes, Lyft, ApolloScapes, Agroverse
AWS and MLOps: Redshift, S3, Kinesis, Lambda, EC2, Flask, Kafka, Spark Streaming, Kubernetes.

Experience

Sep'17 - Present **Graduate Research Assistant, Realtime Intelligent Systems Lab | Las Vegas, NV**

- Develop baseline deep learning models based on RNN/LSTM, GAN and VAE to forecast pedestrian motion. Leverage computer vision techniques such as semantic segmentation to incorporate visual features into forecasting model reducing prediction error by **12%**
- Modeled pedestrian interaction using Spatio-Temporal Graph Convolution Neural Networks and applied attention mechanism using Transformers which further reduced trajectory prediction error
- Building deep learning based real time trajectory prediction system to be deployed on AWS for pedestrian behaviour analysis at road intersections.

Jan'20 - July'20 **Research Intern, Automotive Products Lab, Hitachi America | Detroit, MI**

- Implemented end-end machine learning solution to develop eco-friendly routing technology for connected and automated vehicles. Managed entire life cycle from developing proof of concept to model deployment.
- Set up PostgreSQL database on Linux server to store vehicle odometer and routing information. Performed feature engineering, forecast speed using LSTMs to estimate fuel consumption. Optimized DL model using TensorRT and deployed on Nvidia Xavier. Built R-Shiny dashboard to visualize fuel efficient routes

Jun'19 - Aug'19 **Applied Scientist Intern, Payments and Products, Amazon.com | Seattle, WA**

- Responsible for prescriptive and predictive modeling for **UK Branded Credit Cards**. Performed exploratory analysis to develop 400 features and built logistic regression model to predict customer conversion probability with accuracy of **93%**
- Provided incentives by targeting high quality customers through segmentation which resulted in **30k** approvals in **2 months**

Apr'16 - Sep'17 **Controls Systems Specialist, Fulfilment Centers, Amazon.com | Avenel, NJ**

- Initiated data driven practices to evaluate sortation equipment downtime. Developed anomaly detection model to predict redundant alarms saving **10hrs** downtime and **33%** production losses
- Created dashboards using Tableau to visualize sensor alarms and share insights with operation managers

Jan'15 - Dec'15 **Research Assistant, New York Institute of Technology | NY**

- Received research funding of **USD 160,000** from **UTRC** for traffic density estimation modeling
- Developed data collection methodology through in-vehicle sensors and cellular infrastructure.
- Forecast traffic density using discretized Lighthill-Whitham-Richards traffic flow Model

Open Source Projects

Credit Card Fraud Detection using Unsupervised Machine Learning

- Predicted fraudulent credit card transactions using unsupervised machine learning algorithms such as Isolation forest, One Class SVM and deployed using Flask application
- Set up data ingestion pipelines using spark and kafka for realtime model inference. The model is deployed using Flask, Docker and Kubernetes.

Product Sales Forecasting using ML/DL Techniques

- Used forecasting techniques (LSTM and VAR) to predict sales of multiple products across different stores.

Publications

July '21 **32nd IEEE Intelligent Vehicle (IV) Symposium, Nagoya, Japan, 2021**
STGT: Forecasting Pedestrian Motion using Spatio Temporal Graph Transformers (Submitted)

Jun'20 **15th International Symposium on Visual Computing (ISVC), San Diego, USA, 2020**
CNN,Segmentation or Semantic Embeddings: Evaluating Scene Context for Trajectory Prediction

Jun'19 **30th IEEE Intelligent Vehicle (IV) Symposium, Paris, France, 2019**
SSeg-LSTM: Semantic Scene Segmentation for Trajectory Prediction

Nov'16 **19th IEEE Intelligent Transportation Systems Conference (ITSC), Rio, Brazil, 2016**
Prediction of Traffic Density From Wireless Cellular Data

Conferences/Talks

Nov' 15 ITS Travel Information System and Mobile Application for Enhanced Transportation Workshop

Dec' 15 4th Connected and Autonomous Vehicles Symposium at SUNY Polytechnic, Albany NY

Dec' 14 Symposium of University Research and Creative Expression (SOURCE) NYIT, NY