AKSHAY KULKARNI

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EXPERIENCE

Khoury College of Computer Sciences – *Research Assistant* **Boston, MA**
Vitek Lab – [MSstatsQC-ML] Jan 2020 - Present

- Collaborating with an international group of researchers to explore Machine Learning approaches to optimize quality control in mass spectrometry-based proteomics.
- Researching & implementing efficient ML models for the tool included as part of the open-source MSstatsQC R/Bioconductor package.
- Developing an interactive web interface for the MSstatsQC-ML tool to enable users to upload and analyze optimal performance of MS runs.

Northeastern University – *Teaching Assistant* **Boston, MA**
– CS3200 [Database Design] Sep 2019 - Dec 2019
– DS4100 [Data Collection, Integration and Analysis] Jan 2019 - May 2019

- Designed coursework and assignments evaluated submissions and mentored students in implementation of projects.
- Guided & tutored students in class or during office hours to help them master & reinforce learning concepts such as tidying, storing, analyzing data & employing Machine Learning techniques in R as well as designing databases in MySQL

Predikly **Pune, India**
– *Junior Data Analyst* Aug 2017 - May 2018

- Performed data cleaning, visualizations & contributed in development of dashboards & predictive analytics solutions with client-sourced data.
- Worked as part of the sentiment analysis team, assisting in mining and tokenization for large corpora of texts ranging from customer support incidents, product reviews, social media feeds, news articles, documents, and other sources.

Zio Technologies L.L.C **Dubai, U.A.E.**
– *Data Insights Intern* Aug 2015- Jan 2016

- Worked with the analytics team to analyze the sales of various AV components (Security, Digital signage) in different parts of the Gulf region.
- Directly worked with the managers to come up with strategies and take decisions to help maximize profit from the analysis.

SKILLS

- **Languages:** Python, R, SQL, Java, Scala, Bash, MATLAB, Octave, HTML, CSS
- **Tools & Platforms:** IDEA & PyCharm, RStudio, Jupyter, GSuite, Git, Anaconda, Tableau, PowerBI, MongoDB, Docker, AWS, GCP
- **Libraries & Frameworks**: SkLearn, NumPy, Pandas, TensorFlow, Keras, PyTorch, Django, Flask, RShiny, Lucene, Spark, MapReduce, H2O

PROJECTS

Distributed Matrix Factorization for Recommender Systems [Python, Scala, Spark, AWS-EMR] **Oct`19 – Dec`19**

- Developed a scalable parallelized algorithm to decompose a large sparse ratings matrix into lower k-dimensional user & item latent factor matrices using Alternating Least Squares algorithm in order to optimize large scale computation of recommendations in explicit collaborative filtering.
- Deployed the algorithm on varying sizes of clusters on AWS-EMR to execute the factorization achieving near linear speedup and scaleup.

Classification of chest radiographs using Convolutional Neural Networks [Python, Google Cloud Platform] **Oct`19 – Dec`19**

- Built CNN architectures to classify chest x-rays from the NIH Chest X-ray Dataset containing 112,120 patient records (~50 GB pre-sampling) into one of the 14 possible conditions (Cardiomegaly, Effusion, Pneumothorax etc.)
- Reduced computational overhead by training on pre-trained CNN architectures such as ResNet50 & InceptionV3 in Pytorch-FastAI & Keras.
- Employed techniques such as one-cycle-policy and cyclic momentum to tune the network optimally and allow for significantly faster convergence while training models in deep learning cloud VM instances to achieve ~80% validation accuracy on binary classification across all labels.

Decision Support/Multi-Objective Optimization & Visualization Tool [Python, DASH, MYSQL, Heroku] **Jun`19 – Aug`19**

- Deployed a re-usable database-agnostic decision support tool with a React front-end and the core components developed purely in Python to enable a user to perform trade-off analysis.
- Implemented functionality to fetch data to display a decision table & calculate the Non-Dominated set of objectives to aid the user with identifying the best min/max multi-objective solution.
- Incorporated methods to plot a spatial interactive Pareto Frontier/Curve for the selected features or objectives

Analytical Nature Quantification of occupations in O*NET Database - [R, SQLite, kernLab] **Mar`19 – Apr`19**

- Trained and Analyzed the performance of Gaussian Process Classifier on the O*NET database (sourced from U.S. Dept of Labor)
- Implemented other models like LDA, QDA & RandomForest on the same multidimensional data pertaining to over 974 unique occupations.
- Achieved 85%+ on all models with ~96% accuracy on the Gaussian process model for quantifying the analytical nature of an occupation.

EDUCATION

NORTHEASTERN UNIVERSITY **Boston, MA**
Khoury College of Computer and Information Sciences Sep 2018 - May 2020
[Master of Science] M.S. in Data Science (GPA: 3.713/4.0)
Courses: Algorithms, Data Management and Processing, DBMS, Information Retrieval, Large Scale Parallel Data Processing, Supervised & Unsupervised Machine Learning

BIRLA INSTITUTE OF TECHNOLOGY & SCIENCE, PILANI – DUBAI CAMPUS **Dubai, U.A.E.**
B.E. [Hons] in Electronics and Communications Engineering Aug 2012 - Jul 2016
Related Courses: Digital Image Processing, Communication Systems