

RAMKISHAN PANTHENA

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Education

Northeastern University, Boston, MA

May 2019

Master of Science in Data Science

Relevant Courses: Machine Learning, NLP, Information Retrieval, Algorithms, Parallel Data Processing in MapReduce/Spark

Awards: GE Aviation Hackathon - Won "[Most Real Impact Team](#)" Award for solving GE's data challenge problem

University of Mumbai, Don Bosco Institute of Technology (DBIT), India

May 2009

Bachelor of Engineering in Electronics and Telecommunication with First Class Honors

Technical Knowledge

Programming/Scripting Languages: Python, R, Shell Script, Java, Matlab, Scala, SQL, JavaScript, HTML

ML Tools/Frameworks: TensorFlow, NLTK, Scikit-Learn, Pandas, Gensim, Spark MLlib, Weka

Big Data/Cloud: Hadoop, Spark, MapReduce, Azure – Databricks/Storage, AWS – EMR/EC2/S3, Heroku

Databases: Teradata 15X/14X/13X, Elasticsearch, Oracle, Netezza, SQL Server, MongoDB, SQLite

Visualizations: Matplotlib, GGplot2, D3, SVG, Plotly, Seaborn, NetworkX, Tensorboard, Tableau

NLP algorithms implemented: Trigram Language Modeling, Part-of-speech tagging, Brown Clustering, Naïve Bayes

IR algorithms implemented: Document Indexer, Web Crawler, PageRank, Vector space and Language models

Research and Professional Experience

Northeastern University, Boston, MA

May 2018 – Present

Machine Learning/NLP Researcher

Master's Thesis: Word-vector Regularization for text classification algorithms (R&D – ML, NLP)

- Improved classification performance when there are useful signals present in synonymous but rare words
- Implemented a novel regularizer using TensorFlow that assigns similar weights to words with nearly the same meaning
- Outperformed logistic regression to achieve over 45% improvement in Set-Accuracy after testing with multiple datasets

Grantham Mayo Van Otterloo & Co., Boston, MA

May 2018 – Dec 2018

Data Science Development Co-op

Earnings Call Transcripts to detect Profit Warnings (R&D – NLP, ML, Big Data)

- Research project that parsed the language used in the earnings call using NLP techniques to determine linguistic patterns that systematically lead to higher or lower post-call profit-warnings
- Trained ML model with features like company's last quarter/last year performance, Sentiment expressed on forward-looking statements, Fog Index, Vocab Diversity on both the prepared management remarks and analyst QA section
- Achieved F1-score of 54% after extensive hyper-parameter tuning with GridSearchCV

EDGAR Topic Modelling (Production Deployment – NLP, ML, Big Data)

- Deployed LDA model in production using Azure, PySpark and Databricks to identify topics across SEC EDGAR archive on 10-K annual filings and compared topics of each company to detect other companies which discuss similar topics
- Compared topics generated by Python and Spark LDA models by computing the KL-divergence scores between both models given their topics and weights, reducing final model training time from 3 hours to 4 minutes
- Leveraged Pandas UDFs to run native Python code with PySpark, reducing run-time from over 60 minutes to 8 minutes

Start-up Success Prediction (R&D – ML, Interactive-Visualization) [GitHub](#)

- Designed and implemented an interactive web-based visualization using D3.js that allows end user to build a ML model to predict start-up success for US companies and visualize the predicted performance of start-ups across each state
- Developed a medium through which user can visualize model performance through an ROC curve; and allowed comparison between models with different hyper-parameters by juxtaposition of several ROC curves
- Connected client-side visualization via a REST API to server-side modeling in Python and deployed on [Heroku](#)

Fast Time Series (R&D – Big Data)

- Generated and wrote multiple-file HDF5 datasets in parallel using PySpark and Databricks to an Azure Storage Container to augment the current file caching solution, reducing file wait time from 20 minutes to 5 seconds
- Built a REST API with helper functions in MATLAB to cache the files locally from cloud

Teradata, Mumbai, India

June 2010 – Dec 2016

Technical Consultant

- Conducted statistical analysis on various systems, to ensure efficient system health, and resolved anomalies within the data in a timely manner, improving system performance by 30%
- Designed an automated 'Data Migration Tool' using Linux Shell Scripting and Teradata Utilities to facilitate effortless migration of data from one Teradata environment to another
- Developed Stored Procedures and User Defined Functions in SQL, C, Python to implement user specific requirements
- Conducted research project on loading and retrieving unstructured data (images/photos) using BLOB, JSON data types
- Created and optimized complex ETL/ELT jobs using Teradata utilities, Teradata Parallel Transport (TPT) and Viewpoint
- Designed ETL for implementation of Slowly Changing Dimension (SCD) Type1/Type2 loads
- **Awards:** Teradata ADC Employee of the Quarter (Q4 2014), ADC Project Long Service Award (June 2012 and June 2014)

Academic Projects

Northeastern University, Boston, MA

End-to-end Neural Architecture for Reading Comprehension [GitHub](#)

- Implemented a match-LSTM and Answer-Pointer model in TensorFlow for machine comprehension that predicts the start and end position of an answer span, given a question and passage
- Achieved an Exact Match score of 63% on the SQuAD Dataset

Vertical Search Engine

- Implemented a web crawler in Python that crawled over 20,000 web links to construct a collection of documents focused on a particular topic while adhering to politeness policy of the websites
- Stored the data in Elasticsearch and tied it up with UI to allow searching through crawled content
- Implemented PageRank algorithm to compute the PageRank for every page in the crawl

Foreground-Background Pixel Classification for Brain scans [GitHub](#)

- Classified a highly unbalanced dataset with over 99.46% data belonging to one class
- Improved training data diversity by performing rotations and mirroring in the X-Y plane; and reduced class imbalance by under-sampling background records
- Achieved a final accuracy of 99.74% using Random Forests and Boosted Trees

Movie Recommender System

- Built a system that examined the ratings of movies provided by users to predict movies that a user might like
- Used K-NN, K-Means, Matrix Factorization, Perceptron for comparison and achieved F1-score of 69.12%

Sentence Generation with Language Modelling [GitHub](#)

- Implemented trigram language model with unknown word handling and smoothing
- Generated plausible sentences and achieved perplexity of 79.8 on the test set using interpolation smoothing

Sentiment Analysis of IMDB Movie Reviews

- Detected the overall sentiment of a text review and achieved an F1-score of 81% on the test set
- Naïve Bayes, Multilayer Perceptron and LSTM using word vector embeddings were used for performance comparison