Nishant Gurunath

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AREA OF WORK

Research and product development using Machine Learning and Natural Language Processing (NLP) to extract information, build knowledge and make inferences from text data.

EDUCATION

CARNEGIE MELLON UNIVERSITY (CMU)

Master of Science in Electrical and Computer Engineering
Graduated December 2019
Pittsburgh, PA
GPA: 3.78 / 4

INDIAN INSTITUTE OF TECHNOLOGY, BOMBAY (IIT BOMBAY)

Bachelor of Technology + Master of Technology in Electrical Engineering + Minor in Computer Science
Graduated June 2016
Mumbai, India
GPA: 8.57 / 10

COURSEWORK

CMU

Introduction to Machine Learning
Introduction to Deep Learning
Foundations of Computer Systems
Probabilistic Graphical Models
Computer Vision
How to Write Fast Codes
Machine Learning for Signal Processing

IIT BOMBAY

Data Structures and Algorithms
Probability and Random Processes
Data Analysis and Interpretation
Linear Algebra
Graph Theory

SKILLS

PROGRAMMING

Python • C/C++ • MATLAB

SOFTWARE & PACKAGES

Pytorch • AWS • Elasticsearch • FastAPI • RabbitMQ • Docker • Pyspark • k6.io • Neo4j • Flask • Github • MLflow • PyPI • Streamlit

WORK EXPERIENCE

ASSC DIRECTOR - MACHINE LEARNING | Moody's Analytics | New York, NY
Feb 2020 – Present | Machine Learning - Predictive Analytics

Commercial Real Estate (CRE) - News Pulse | Technical Lead

- Led a team of 5 engineers to deploy CRE - News Pulse on Moody's REIS website
- Designed an ML enrichment pipeline to provide real-time News around CRE markets
- Implemented the pipeline using a **Docker-based microservices** architecture; utilized **Rabbitmq** messaging and **Elasticsearch** database as part of the infrastructure
- Fine-tuned Transformer-based text classification models to **filter and enrich** (with CRE markets & sectors) relevant news articles; obtained greater than 85% F1-score
- Created **FastAPI** endpoints to provide real-time and trending news for CRE markets

Task Force on Climate-related Financial Disclosures | TCFD 2021

- Created a machine learning pipeline for climate-related **information extraction**; extracted climate-related disclosures from company annual and sustainability reports
- Implemented a **pdf text-extraction** model using PyMuPDF and AWS Textract
- Designed an embedding-based **text retrieval** service using a Distilroberta model
- Fine-tuned an Electra cross-encoder model for **text ranking** and a Roberta model for **text classification**; obtained more than 80% F1-score

Know Your Customer (KYC) | KYC - Machine Learning | Ongoing

- Evaluated **entity resolution (ER)** tools - Quantexa and Senzing; working to deploy a Transformer-based custom ER model that improves the business efficiency by 20%
- Implementing an enrichment pipeline to build **entity risk profiles** from news media; developed **multilingual NER**, **Keyphrase Extraction** and Risk Relevance models
- Contributed in building big-data ML models in Spark for risk-oriented **entity alert systems**; implemented **experiment tracking** and **model governance** using MLflow

Product Sales-Recommendation | Moody's Analytics Sales

- Created recommendation models for the Moody's Analytics sales team to acquire new customers and upsell products to existing customers
- Merged the company financials data with the sales history data to obtain the features
- Trained LSTM and Gradient Boosted models to recommend upsell and new sales opportunities respectively; added focus on **model interpretability & explainability**

RESEARCH ASSISTANT | Separabl: Disentanglement in Speech | CMU
January 2019 - Dec 2019 | Prof. Alan Black | Prof. Richard Stern

- Proved that multinode VAE can be used to separate speech and music in audio
- Experimentally determined the number of latent nodes required for **source separation**; showed that the same can be determined from the input data distribution
- Established improvement in Speech Synthesis performance using separated speech

ACADEMIC PROJECTS

HIERARCHICAL REINFORCEMENT LEARNING | CMU
Spring 2019 | Probabilistic Graphical Models | Prof. Eric Xing

- Proposed to learn policies simultaneously for two agents, manager and worker, working at different temporal scales to target environments with sparse rewards
- Demonstrated that method is applicable with all reinforcement learning algorithms
- Conquered sparse reward robotic environments - ReacherV2 and FetchReachV2 where standard/flat reinforcement learning methods fail completely

LISTEN, ATTEND AND SPELL: ATTENTION LANGUAGE MODEL | CMU
Fall 2018 | Introduction to Deep Learning | Prof. Bhiksha Raj

- Trained a **speech recognition** LAS model from scratch using cascaded LSTM networks
- Designed a pyramidal BiLSTM speech encoder to reduce computational complexity
- Modeled an attention-based LSTM transducer; obtained a WER of 75%