Himanshu Maurya

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Education

University of Edinburgh — Edinburgh, Scotland
Master of Science in Speech & Language Processing — *Sept. 2022 - Aug. 2023*

IIITDM Jabalpur — MP, India
Bachelor of Technology in Computer Science & Engineering — *Aug. 2013 - Aug. 2017*

Experience

Quantiphi Inc. (Applied Science Team) — London, UK
Machine Learning Engineer - Part Time — *Oct 2022 - Jan 2023*

- Developed a python package for finding optimal routes with stops for optimal *Vehicle Routing* by simultaneously optimizing for *Capacity*, *Time* and *Distance* constraints using Google OR-tools.

iSchoolConnect Technologies Pvt. Ltd. — Mumbai, IN
Lead Machine Learning Engineer — *Jan 2020 - August 2022*

- Lead a team of 5 ML Engineers. Worked on team's planning and strategy, focusing on feature development to be integrated as part of iSchoolConnect's service offerings.
- **Document Writing Analyzer**: Worked on *Essay Scoring, Coherence, Discourse Structure Identification* for college admission essays
  - Trained **Adapter Transformers** (*Adapter Fusion*, *Parallel Adapter*, *Mix-n-match Adapters*) for low-resource model training and tackling data-scarcity by leveraging learning from data-rich classes. Effectively reduced deployed model parameters by one-eighth.
  - **Patent:** *MAURYA, Himanshu et al.* Machine Learning System for Analysing the Quality and Efficacy of Essays for Higher Education Admissions. US Application No. 17/453,416
- **Online Exam Proctoring Engine (Acquired by Turnitin)**: Monitoring suspicious activities in an online exam, providing both Human-in-Loop and AI-enabled proctoring
  - Lead the implementation of *Job Processing Module*, *Human-In-The-Loop system*, *Integrity Breach Detection Models*, *Proctoring Report Generation*, *Data Processing Pipelines*
  - Designed & Implemented the *Proctoring Engine* using *Docker-Compose* to orchestrate 6 underlying models. Scaled the system to process over *1.5 Million Exams/month*

Quantiphi Inc. (iSchoolConnect Team) — Mumbai, IN
Machine Learning Engineer — *Dec 2018 - Dec 2019*

- **Document Writing Analyzer**: System analyses *Statement of Purpose & Admission Essays* for content quality and coverage of important aspects, grammatical correctness, and providing actionable feedback on improvement of applicant's essays

Staqu Techonologies Pvt. Ltd. (R&D Team) — Gurugram, IN
Jr. Research Engineer — *June 2017 - October 2018*

- **News Intelligence Engine**: Implemented NER for Indian languages, similar news clustering and machine translation modules. These modules enabled semantic search capabilities in *PINE*, an advanced AI data aggregation and search engine

Udacity Inc. — Remote
Independent Consultant — *May 2018 - Present*

- Student Mentor and Code Reviewer at *Udacity School of Artificial Intelligence*
- Awarded Elite Mentor badge for being consistently one of the highest performing student mentors at Udacity

Oracle India Pvt. Ltd. — Bengaluru, IN
Software Development Engineering Intern — *June 2016 - Nov 2016*

- **Oracle Retail Cloud**: As a part of the early stage development team of Oracle Retail I worked on building cloud platform to provide PaaS for hosting *Oracle Retail Applications* on *Oracle Cloud*

Research and Development Projects

Speech Projects

TTS, Deep Learning

- **TTS-Speaking-Style Modeling**: Aligning latent space of speaking style with human perception using a re-embedding strategy. (MSc. Dissertation Project - In Progress)
    - Manipulate the latent prosody space using light-supervision from human annotators. Re-embed synthesised utterances that human annotators have tuned acoustically to match a target speaking style and fine-tune the bank of global style tokens for better style modeling.
    - Exploring a framework to make meaningful edits to speech that which can avoid the drawbacks of iterative methods such as Gibbs Sampling. Using FastSpeech2 with hierarchical prosodic features at word, utterance level with additional variance adaptor for spectral tilt.
- **Speaker Emotion Recognition**: Implemented using *Spectrogram (2D CNNs)* and *Phoneme Embedding (LSTMs)* trained on USC's IEMOCAP Dataset

NLP Projects

Text Processing, Deep Learning

- **Essays Analysis**: Multi-aspect analysis of college admission essays for content coverage and quality. Suggestion for areas of improvement of essay, resulting in best possible essay as per applicants writing potential
    - **Content Classification**: Identification of the presence of important aspects such as *Future Goals*, *Work Experience* etc. using *stacking ensemble* of custom multi-label machine learning and deep learning algorithms
    - **Grammar Correction**: Identification of incorrect use of grammar, identification of voice, grammatical errors such as *Verb Errors, Logical Confusion, NOT Problem, Unclear Pronouns, Contractions etc.*
    - **iSCLinguisticLib**: Built and maintained an inhouse library for building textual features such as *Coherence, Discourse, Psycholinguistic etc.* to be consumed for model training
- **Named Entity Recognition Engine**: Extracted person, organization, location, miscellaneous entities from the text in *English, Hindi, Urdu, Bangla & Punjabi* language
    - Implemented a *Bidirectional LSTM-CRF* model using both word and characters as features
    - Achieved **0.92 F1-Score** on CoNLL-2003 test set (English) and **0.87 F1-Score** on self-curated Hindi dataset
- **Stance Detection**: Automatically detecting if the author of a piece of text is in favor or against of a target
    - Implemented a *Multi-Head Attention Transformer Model* with an attention based decoder for language model training and classifier head for classification of stance labels.

Achievements

- *A Beautiful Mind* award for *Commitment to Innovation* for H2 2020 by *iSchoolConnect*, April 2020
- Qualified for Kharagpur & Amritapuri Regionals, and received a *Certificate of Achievement, ACM International Collegiate Programming Contest*, India, 2014
- Received the *Prime Minister's Scholarship Welfare and Rehabilitation Board, Ministry of Home Affairs of India,* November 2016

Certifications

- **Personalized Recommendations at Scale**: End-to-End Large Scale Recommender System at Scale
- **Udacity Data Streaming Nanodegree**: Data Streaming using *Apache Kafka & Apache Spark*
- **Udacity Artificial Intelligence Nanodegree**: Specialization in *NLP, Computer Vision & Speech Processing*
- **Udacity Deep Learning Foundation Nanodegree**: Implemented Neural Networks – *CNNs, RNNs*, NLP, Machine Translation, *GANs*

Programming Skills

Database:	MongoDB, PostgresSQL, Neo4j
Application Servers:	Tornado, Flask
Programming Languages:	Python, Core Java, C++
Natural Language Processing:	NLTK, Spacy, Gensim, FastText
ML & DL Frameworks:	Tensorflow, PyTorch, Scikit-Learn
Data Processing Tools:	Apache Spark, Apache Kafka
System & Platform Tools:	GCP, AWS, Docker, Docker Compose