Prasanth Bathala

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EDUCATION

Georgia Institute of Technology, Atlanta, GA Aug 2022 - May 2024
Masters in Electrical Engineering and Computer Science - Machine Learning and AI *GPA: 4.0/4.0*

Courses : *Natural Language Processing (Research), Statistics and Machine Learning, Deep Learning, Adv. Programming Techniques, Computer Vision, Advanced Data Structures and Algorithms*

PROFESSIONAL EXPERIENCE

Applied Scientist Intern | Amazon Sept 2023 - Jan 2024
*Worked at AGI (Alexa AI) for improving **text generation** in **LLMs** for conversational agents.* *Bellevue, WA*

- Developed a robust pipeline to run **multi-node** batch training and inference on Sagemaker. Evaluated and tested for fine-tuning (**SFT**, **LoRA**) Alexa LLM (**7B, 13B, 30B**), **Llama v2**, **Flan - T5** for Query Rewriting (**CQR**) task.
- Introduced **COGIT**, a novel approach of tailoring extreme scale **LLM** with **policy adapters** to optimize for arbitrary task objectives. Surpassed pre-trained models in three challenging language tasks.
- Enhanced performance of COGIT with contrastive loss, significantly outperforming fully **supervised fine-tuned (SFT)** model and **Quark** fine-tuned model.

Artificial Intelligence (AI) Engineer Intern | RadicalX June 2023 - Aug 2023

- Led a 5-member team in developing a potent anti-cheat and anti-fraud system, blending **SVM** and **BERT** models.
- Built a robust **Zero-Shot** intent classifier based on **BLINK** architecture for career coach chatbot based on **GPT-4**.

Software Engineer | Infosys Nov 2020 – Aug 2022

- Streamlined CRUD extraction with **Python** and **SQL** automation, saving over 4 days of manual effort.
- Contructed Python scripts for data migration and cleaning, particularly for **Teradata** and **IBM DB2** transfers.

RESEARCH EXPERIENCE

Graduate Research Assistant | Pathology Dynamics Lab Jan 2023 – Present
Guide: [Prof. Cassie S. Mitchell, Department of Biomedical Engineering](), Georgia Tech *Atlanta, GA*

- Involved in curation of new text dataset of 10K records for comprehensive data analysis and model development.
- Optimized multi-label text classifiers using **RoBERTA** and **active learning** achieving 60% F-1 score with limited labeled data.
- Worked on Information Retrieval for meta-analysis using LLMs based on **Open AI API** like **ChatGPT** and **GPT-3**.
- Developing a **Multi-label Hierarchical Contrastive learning** approach for Biomedical Entity Linking.

NLP Research Assistant | Janus Lab Feb 2023 – May 2023
Guide: [Prof. Hsiao-Wen Liao, Department of Psychology](), Georgia Institute of Technology *Atlanta, GA*

- Conducted Exploratory Data Analysis (EDA) on **1K+** text files using regex, pandas and stemming.
- Implemented transfer learning on transformer models like **BERT**, **Spacy** to detect racial bias in each document.
- Enhanced a text summarization model utilizing **BART** to visualize insights from interview transcripts.

PROJECTS

Alzheimer Detection and Progression on ADNI | *Multimodal data, 3D CNN, TCN* Jan 2023 – May 2023

- Built **3D CNN** model based on **RESNET18** for detection of Alzheimer's achieving 88.58% accuracy.
- Implemented Encoder-decoder network with **TCN** and **BiLSTMs** achieving 75% F1 score for risk prediction.
- Created user-friendly applications using **streamlit** for deploying ML models. [*Code*]

3D Point Cloud Classification | *CV, PointNet, DGCNN* Jan 2023 – May 2023

- Conducted extensive evaluation and ablation study on **PointNet** and **DGCNN** architectures on what factors actually influence the accuracy using diverse datasets[*Code*]

Depression Detection through Audio, Visual & TextualData | *SVM, CNN, LSTM* Dec 2022 – Dec 2022

- Programmed a multimodal depression detection model using **SVM, CNN, and LSTM**.
- Achieved a **70%** improved F-1 Score with early fusion of audio, video, and textual data using **LSTM** [*Report*].

Personalized Hotel Finder with Customer Reviews | *Bayes, GMM, K-means, BERT*   Aug 2022 – Dec 2022
- Developed and deployed a personalized hotel recommendation system, extracting Noun-Adjective pairs from 515k reviews using **BERT** and **Spacy**, clustering aspects with **unsupervised learning**, and computing sentiment for 1267 hotels, hosted on **Vercel** for seamless user experience[*Report*, *Website*].

Chatbot Application using DialoGPT | *DialoGPT, RL*   Apr 2022 - Jul 2022
- Designed a chatbot application based on pre-trained model, **DialoGPT**, and fine-tuned using PPO.

Music Title Recommendation System | *Collaborative Filtering, Autoencoders*   Aug 2022 – Dec 2022
- Implemented Content-Based and Collaborative Recommender Systems for music titles, leveraging techniques like pivot tables, similarity scores, matrix factorization, and AutoEncoder (AE) with Restricted Boltzmann Machines (RBM) for enhanced recommendations [*Code*].

TECHNICAL SKILLS

Programming: Python, SQL, C/C++, MATLAB, CUDA, Java, HTML/CSS
Frameworks: Pytorch, Tensorflow, Deepspeed, hf-Accelerate, Node.js
Libraries: NumPy, Pandas, Matplotlib, Scikit-Learn, NLTK, Spacy, Gensim, OpenCV, Keras, HuggingFace, Scipy
Developer Tools: Git, Amazon Web Services (AWS), Docker, AWS S3, Amazon Sagemaker, VS Code, Visual Studio

PUBLICATIONS

- **BioSift: A Dataset for Filtering Biomedical Abstracts for Drug Repurposing**, *published at SIGIR 2023*

- **A Comprehensive Evaluation of Biomedical Entity Linking Models**, *published at EMNLP 2023*

- **Controlled Text Generation at Inference Time (COGIT): Efficiently Tailoring Large Language Models with Policy Adaptors**, *Under Review at Amazon*

- **A Hierarchical Contrastive Learning approach for Biomedical Entity Linking**, *Working Paper*

- **Reducing Hallucination in Vision Language Models (VLM) via NL feedback**, *Working Paper*

ACHIEVEMENTS

- Attained **Rookie of the Quarter** award among top 1% of rookies at Infosys in entire Chennai DC office.

- Received 3 **INSTA Rise** awards for outstanding **Kaizen** contributions and led team activities for 100+ members.

- Earned **Best Paper** award in Power and Energy Track at INDICON 2020 Conference among 100+ presentations.