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*]

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**, *accepted 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*