Ruthvik Penumatcha . Jarvis Consulting

I hold a Bachelor's degree in Computer Engineering with a specialization in Software Engineering, and a Master's degree in Electrical and Computer Engineering with a specialization in Artificial Intelligence from Toronto Metropolitan University (formerly Ryerson University). My academic background has equipped me with deep technical expertise and problem-solving skills. Throughout my academic journey, I developed a keen interest in Data Engineering, DevOps, and Software Development, and I have gained hands-on experience in these areas by working on both academic and personal projects. I worked as a research assistant at Toronto Metropolitan University, where I contributed to the development of a novel bias measurement metric for Large Language Models. I utilized tools and technologies such as Python, PyTorch, NumPy, Pandas, and Matplotlib to process, analyze, and implement the solution. Additionally, I have worked on various personal projects where I used tools such as FastAPI, Pandas, and Spark SQL to analyze data extracted from web sources. These projects have enhanced my skills in data analysis, data manipulation, and building scalable systems. I am currently seeking opportunities in Data Engineering, DevOps, or back-end development, where I can apply my technical skills, passion for continuous learning, and collaborative spirit to solve complex technical challenges.

Skills

Proficient: Java, Python, JavaScript, Node.js, Express.js, Linux/Bash, RDBMS/SQL, NoSQL/MongoDB, HTML, CSS, Agile/Scrum, Maven, Git, REST APIs

Competent: Spark, Hive, Hadoop, Docker, React, Google Cloud Platform (GCP), Next.js, Postman

Familiar: MATLAB, C, Jenkins, RabbitMQ, gRPC, VHDL, LaTeX

Jarvis Projects

Project source code: https://github.com/jarviscanada/jarvis_data_eng_RuthvikPenumatcha

Cluster Monitor [GitHub]: The Linux Cluster Monitoring Resource app is a Minimum Viable Product (MVP) that has been developed for the Linux Cluster Administration (LCA) team at Jarvis. It has been developed to allow the client to monitor the system specifications and resource usage information of 10 Linux clusters, which communicate with each other through a network switch. This project has been implemented by creating a PostgreSQL database instance on a Docker container to store hardware specifications and resource usage information. Shell scripts were then created to handle various tasks, such as creating a Docker container and inserting data into SQL tables. Moreover, the crontab feature on Linux has been used to automate the process of executing a shell script to store resource usage information of a Linux cluster every minute. Finally, Git has been used for Version Control.

Highlighted Projects

Big Data Analysis of Used Car Sales in Europe: Performed analysis of used car sales in Europe over the past 20 years using Google Cloud Platform (GCP) and Spark SQL. Sourced a dataset containing over 3 million rows from Kaggle. Conducted data cleaning to remove irrelevant columns and rows containing null or empty values. Wrote Spark SQL queries to identify trends such as the most popular car makes and models across various price ranges, and determined the least preferred vehicles by users over the past 5, 10, and 20 years.

Schema-Tune: Noise-Driven Bias Mitigation in Transformer-based Language Models [GitHub]: Co-authored the research paper and helped successfully implement the Schema-Tune framework to reduce biases in large language models. The framework introduces curated and adapted noises to the input embeddings of language models to challenge the model's embedded stereotypes. I utilized various tools such as Python, PyTorch, Pandas, NumPy, and Matplotlib to help train the models and evaluate the performance of the models. The paper has been published at the ACML 2024 conference.

Binary Semantic Segmentation of Drone Images: Developed a binary semantic segmentation model using the U-Net architecture to accurately identify foreground and background components. The model was successfully trained on a dataset of drone images and their respective ground truth. The model obtained high training, validation, and testing accuracy of over 98%, showing its effectiveness.

Full-Stack E-commerce Platform [GitHub]: Developed a full-stack E-commerce website using Node.js, Express.js, MySQL, and vanilla JavaScript with HTML/CSS. Implemented User Authentication (Login/Signup), product browsing and search, shopping cart functionality, and a checkout process. Designed a MySQL database to store user accounts,

product inventory, and transaction history, including the purchase quantities, dates, and total price. Built RESTful APIs for front-end and back-end integration, ensuring seamless data flow and dynamic content rendering.

Professional Experiences

Software Developer, Jarvis (April 2025-present): As a software developer, I contribute to multiple projects using technologies such as Linux, Bash scripting, PostgreSQL, Docker, and Git. I play an active role in designing, implementing, and deploying scalable solutions that meet client needs. I collaborate closely with a cross-functional team in an Agile/Scrum environment, participating in sprint planning, daily stand-ups, sprint reviews, and retrospectives.

Research Assistant, Toronto Metropolitan University (September 2024-December 2024): Collaborated with a research team to develop an innovative bias measurement metric that addresses the limitations of existing metrics to improve fairness in AI models. Implemented the project utilizing tools and technologies such as Python, PyTorch, Pandas, and NumPy. Incorporated quantum computing principles, including superposition and interference, to evaluate bias. Conducted extensive evaluations on popular LLMs, including GPT-2 and BERT, demonstrating the metric's effectiveness in detecting nuanced biases.

Education

Toronto Metropolitan University (2018-2023), Bachelor of Engineering, Computer Engineering - Graduated with Distinction - Dean's List (2018-2019, 2020-2021, 2021-2022) - CGPA: 3.74/4.33

Toronto Metropolitan University (2023-2024), Master of Engineering, Electrical and Computer Engineering - CGPA: 4.08/4.33

Miscellaneous

- Badminton Enthusiast: Played badminton regularly with friends from middle school through university during my free time. It's a sport that helps me relax and stay mentally focused.
- Cycling: Passionate about cycling during the summer months, using it as an opportunity to stay active, explore my neighborhood, and discover new local spots.