Raihan Rafeek

rafeekrn@mail.uc.edu | linkedin.com/in/raihan-rafeek | github.com/rai1975 | rai-1975.com

Education

University of Cincinnati, Cincinnati, OH GPA: 3.96
Bachelor of Science in Computer Science *May 2027*

Experience

AI & Data Science Intern Jan 2025 - Present
Exelixi AI *Dubai, UAE*
- Develop AI and ML models to address specific customer requirements, leveraging tools like scikit-learn and PyTorch
- Design and implement interactive visual dashboards for model transparency, showcasing key-feature contributions and more
- Create high-quality, engaging demos to present at multiple conferences across the UAE
- Collaborate in a dynamic startup environment, working cross-functionally to deliver projects on time

Undergraduate Research Assistant Aug 2024 - Present
University of Cincinnati *Cincinnati, OH*
- Develop and optimize algorithms to extract features from high-dimensional datasets using Topological Data Analysis (TDA)
- Investigate and implement dimensionality reduction techniques, such as PCA, t-SNE, and UMAP for downstream tasks
- Enhance computational efficiency by reducing time and space complexity, enabling faster data processing for larger datasets
- Conduct experiments to evaluate and validate algorithms informed by research insights

LeopardSAT - 1 Aug 2024 - Present
CubeCats - University of Cincinnati *Cincinnati, OH*
- Create simulation software for Passive Attitude Determination and Control Systems (ADCS) for CubeSats (partnering with NASA and nanoracks), utilizing Pandas, NumPy, and SciPy for data analysis and calculations
- Apply physical models of magnetic materials and hysteresis curves to simulate magnetic torques into the CubeSat's detumbling algorithm, improving the efficiency and stability of the attitude control system
- Integrate data pre-processing pipeline for synthetic dataset with over 6,000,000 data points to reduce runtime for the hysteresis model
- Collaborate with interdisciplinary teams to refine simulation models and ensure alignment with mission objectives

Software Engineering Intern Fall 2023, Summer 2024
Idaho National Laboratory *Idaho Falls, ID*
- Contributed to the development of safety-critical software for nuclear inventory management using Ruby on Rails and PostgreSQL, ensuring compliance with strict regulatory standards and minimizing risk
- Implemented major changes to improve search result filtering speed by optimizing queries through a database migration and implementing caching
- Resolved 30+ critical bugs, including new features, and UI/UX inconsistencies ensuring smooth and reliable application functionality
- Collaborated with engineers in an Agile environment, assisting continuous improvement while receiving mentorship from experienced professionals

Projects

WhiteBox | *Python, Neo4j, Llama 3.1, HuggingFace, Docker, ReactJS* Sep 2024 - Present
- Develop architecture for RAG using GraphDB to store and navigate concept maps of text data
- Design database with over 70,000 nodes with 140,000 edges to enable conceptual queries beyond raw vector searches
- Create a pipeline leveraging fine-tuned large language models (LLMs) to visualize relationships between entities
- Implement advanced querying techniques for efficient data retrieval in the GraphDB framework
- Won Best Hack at the Midwestcon - Future of Data Hackathon with over 70 teams

Memento | *Python, OpenAI, Flask, React, PostgreSQL* Feb 2024 - Mar 2024
- Contributed to an AI-based journaling app for caregivers and patients with Alzheimer's and Dementia
- Implemented Retrieval-Augmented Generation (RAG) techniques using a vectorized Tembo database to minimize AI hallucination
- Assisted in front-end development with React and creating a RESTful API with Flask
- Achieved 3rd Place Overall, Best Social Impact Hack, Best Use of Tembo, and MedPace Award at RevolutionUC

Technical Skills

Languages: Python, Ruby, JavaScript, TypeScript, C++, Java
Frameworks & Libraries: Flask, Rails, Angular, ReactJS, Pandas, NumPy, Matplotlib, Scikit-learn, SciPy
Databases & Query Languages: MySQL, Postgres, Cypher
AI & Machine Learning: BERT, LLaMA, OpenAI, Torch, TensorFlow, HuggingFace Transformers
Creative & Hardware Skills: Video & Photo Editing, Digital Audio Workstation (DAW), 3-D Printing, Digital Marketing

Achievements

CEAS International Outreach Scholar: Scholarship awarded by UC for outstanding international students
Awards: Dean's List, 3x Hackathon Winner, Raised $500 at UC Startup Weekend 2024