

SHAIK ASAADUDDIN KHWAJA

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EDUCATION

University of Cambridge, United Kingdom

Oct 2021 - Jun 2024

Bachelor of Arts (Hons) in Natural Sciences - Physics

- Relevant Coursework: Computational Physics, Statistics, Mathematical Methods

TECHNICAL SKILLS

Programming Languages: Python, SQL, HTML, CSS, JavaScript, LaTeX, VBA

Libraries, Frameworks, & Tools: Numpy, Pandas, Scikit-learn, Git, Docker, Flask, Django, dbt, Cloud Services (AWS: Bedrock; Google: Google Maps Platform, BigQuery)

Certifications: Coursera ML Specialisation, AWS Cloud Practitioner Essentials, dbt Fundamentals

WORK EXPERIENCE

Software Engineer (Freelance)

Oct 2024 - Present

Altair Engineering Inspections Pte Ltd, Singapore

- Conceptualised a web application to enable inspection results from industrial assets to be visualised on the asset's digital twin; currently in the process of implementing a minimum viable product

Undergraduate Research Intern

Jun 2023 - Sep 2023

Cavendish Laboratory: Department of Physics, University of Cambridge, United Kingdom

- Refined the department's experimental physics teaching resources, conceptualizing 2 new projects and implementing improvements in 3 existing projects
- Developed 2 new Python demonstrations and re-factored 2 existing demonstrations to effectively explain and demonstrate concepts such as Fast Fourier Transforms and Diffraction
- Conducted thorough data analysis of 3 existing experiments to identify over 4 previously undocumented sources of error and devised modifications to fix these errors

Software Engineer Intern

Aug 2022 - Sep 2022

Hackbridge, United Kingdom

- Implemented Google Maps APIs with Python as part of a startup's proof-of-concept carpooling app to generate optimal meeting points for drivers and passengers; obtained an approximately 2x speedup over the existing manual matching process
- Formulated different methodologies for matching passengers and drivers to minimise the cost of making API requests, reducing the number of API calls by about 50%

PROJECTS

Options Pricing Using Monte-Carlo and Black-Scholes Model

- Developed and implemented the Monte Carlo and Black-Scholes models for pricing European options in Python, leveraging implied volatility data to compare model predictions with actual market prices of AAPL equity options
- Optimised the Monte Carlo simulation using NumPy vectorisation, obtaining about a factor of 10 decrease in simulation time
- Analyzed the volatility smile of AAPL options and compared it against theoretical expectations

Binary Prediction of Poisonous Mushrooms

- Cleaned and set up pre-processing pipelines using Scikit-Learn for a Kaggle competition dataset containing 21 categorical and numerical features for poisonous and edible mushrooms
- Trained and evaluated Logistic Regression and Decision Tree models using cross-validation, obtaining a public MCC score of 0.96 with the Decision Tree model for the binary classification of edible and poisonous mushrooms on test data

A Custom ChatGPT Chatbot That Provides Employment-Related Legal Assistance

- Led a team of lawyers in Cambridge's LLM x Law Hackathon to carefully curate legal data and optimise the prompt structure to develop a chatbot that can ask legally relevant follow-up questions to the user before suggesting potential legal claims the user has grounds for
- Utilised few-shot prompting to improve the relevance and accuracy of the chatbot's responses to users' queries
- As an extension, implemented the same chatbot by setting up a retrieval augmented generation pipeline with the LLAMA 3 8B model hosted on AWS Bedrock

LEADERSHIP

Co-President, Cambridge University Scientific Society

May 2023 - Apr 2024

- Directed the planning and publicity of over 10 social and academic events annually, including the annual Garden Party which was held in collaboration with 4 other societies and attended by about 90 guests