Blessings Mambwe

linkedin.com/in/bleymambwe
 github.com/bleymambwe
 bleymambwe@gmail.com
 +26 076 1233 907
 (GMT+2) Lusaka, Zambia

SKILLS

- **Languages </>:**   ◇ Dart   ◇ Python   ◇ Javascript
- **Frameworks:**   ◇ Flutter   ◇ Docker   ◇ FastAPI   ◇ Pytorch/Tensorflow   ◇ Google Cloud   ◇ AWS   ◇ SQL

OPEN-SOURCE ENGAGEMENT AND INDEPENDENT RESEARCH PROJECTS

- **Hyvert AI**: Designed a plant condition prediction system through prompt engineering of an extensive language model, enabling accurate predictions based on plant names. Simultaneously, developed a high-traffic website to facilitate seamless interaction and engagement, accommodating thousands of visitors.
- **MTN Mobile Money Hackathon**: Deployed a customer support LLM agent independently, utilizing retrieval-augmented generation on custom MTN data with Python and LangChain, leveraging the ChatGPT API. Ensured AI safety standards through prompt engineering within its domain. Created a visually appealing user interface in Dart with Flutter and hosted the app on a Google Engine instance.
- **Absa Bank Data Science Hackathon** : Was shortlisted for the Data Science hackathon. In under 24 hours, I utilized Python to analyze and predict customer churn from big data. Developed code for data visualization, correlation matrices, and SVM algorithm implementation. See [report]
- **Predicting Fluid Flow with Operator Learning**: Researched the field of operators. Wrote code in Python using PyTorch to extract DMD modes and predict fluid flow. Wrote a report discussing theory & algorithm.
- **Estimating Solubility of Chemical Elements using GraphSAGE**: Used Python with PyTorch to deploy the GraphSAGE model to classify proteins from big datasets of proteins. It archived accuracy of over 80%, wrote a report which included essential graph algorithms. See [report].

EXPERIENCE

- **Absa Bank Innovation Hub**   Nov 2023 – Present | Remote
  Machine Learning Engineer

  - ▷ Spearheaded the development of an AI hub, utilizing LLM agents to address inquiries related to banking and financial law. Employed retrieval-augmented generation on proprietary Absa Bank data.
  - ▷ Coded in Python and Flutter using Dart, utilizing the LangChain library and integrating the ChatGPT API. Successfully deployed the solution on a Google Cloud instance to ensure real-time streaming.
  - ▷ Implemented robust speech-to-text and realistic text-to-speech functionalities.

- **ML Collective**   Jun 2020 – Present | Remote
  Machine Learning Researcher

  - ▷ Successfully deployed the most efficient object detection model, Efficient Detection, to detect airplanes from satellite images using Python and PyTorch.
  - ▷ Collaborated and communicated perfectly with 2 researchers to co-author and submit a blog post to ICLR comparing Deepmind's mechGraphNets model to molecular particle simulators. I simulated flag dynamics, bash scripted to download Blender and created renders using cloud GPU on Google Colab (Linux). See[report].
  - ▷ Proposed a neural-evolutionary NN architecture that theoretically outperforms NEAT and DQN, presented my theory before experts, see [presentation]. Am now writing code in Python leveraging iterative depth first search, trees and other complex design patterns.

- **IO Technolgoies**   April 2023 – June 2023 | Remote, Zambia
  Fullstack Software Developer - Contract

  - ▷ Independently developed a sophisticated vehicle tracking system responsible for notifying users of driving violations, including overspeeding and night driving infractions to adhere to traffic regulations.
  - ▷ Designed an efficient algorithm in Python to detect instances of violations from hundreds of vehicles by calculating time, speed, and other parameters per API request. Updated the database and leveraged multithreading and the Outlook API to dispatch violation alerts instantly to emails.

- ▷ Leveraged AWS Serverless lambda to seamlessly present real-time vehicle information, facilitating remote debugging for enhanced efficiency.
- ▷ Designed a novel algorithm integrating Bing Maps API to assess and classify road conditions. Containerized the system using Docker and deployed it on a AWS virtual machine, ensuring optimal scalability and performance.

- **Konkola Copper Mines**   Oct 2022 – May 2023 | Chingola, Zambia
  Mechanical Engineer - Intern

  - ▷ Independently deployed Yolov8, one of the most accurate image classification machine learning models, to detect pipe leaks, fostering a $300 novel sensor to reduce hazards and maintenance downtime.
  - ▷ Independently efficiently automated data analysis of pump and motor vibrations offering superior efficiency over Excel. This task was normally done by 2 or more people.
  - ▷ Collaborated with the Assistant Superintendent to effectively manage 10×5 multi-disciplinary teams, ensuring smooth predictive and reactive maintenance of Pump-station at one of the world's largest copper mines, and demonstrated excellent work ethic by working an extra 5 hours.

- **Afri-Meta**   Jun 2022 – Sep 2022 | Lusaka, Zambia
  Fullstack Software Developer Intern

  - ▷ Led a team of 4 in building a food classification app with Google Cloud Platform deployment of the machine learning model with technical documentation coded using HTML and CSS.
  - ▷ Independently coded in Python with PyTorch to implement a Normalizer-Free machine learning model from a recent paper, the 'EffNetV2' which is currently the best performing model. It archived an accuracy of 93% and cloud inference time of 0.8 seconds.
  - ▷ Successfully deployed the model on Google Cloud Engine, utilizing Docker for containerization. Involved writing Linux Bash script to streamline the deployment process. See [demo].
  - ▷ Collaborated in a team of 7 with other members to programme an e-commerce app in Flutter using Dart, wrote code to alter SQL database.

- **Manchester United Football Club**   Nov 2016 – Mar 2019 | Manchester, UK
  Hospitality Staff

  - ▷ Demonstrated leadership skills by covering the manager and onboarding new recruits.
  - ▷ I served thousands of football fans on matchdays where I used my communications skills and the ability to use initiative in busy environments.

OTHER PROJECTS AND ARTICLES

- **An ML Algorithm NASA Invented to Land on the Moon**: Published a Medium article dissecting the theoretical foundations of control theory, comprising advanced mathematical derivations of machine learning algorithms, such as particle filtering, Wiener's filter, and the Kalman filter, alongside Python code for practical implementation. See article.
- **Dante Rush Game**: Independently programmed a dynamic game in Flutter using Dart, incorporating Rive animations achieving a smooth 60 frames per second performance.

ACADEMIC EXPERIENCE

- **Academic Tutor**   Apr 2017 – Dec 2018 | Manchester, UK
  - ▷ Tutored A level students in Physics, Chemistry, Biology and Mathematics, received testimony of a student who started ranking in the top 10 from the bottom.

EDUCATION

- **Independent Study**: 2019 - 2021   ○ A Matrix Algebra Approach to Artificial Intelligence   ○ Approximation Theory and Algorithms for Data Analysis   ○ Data Structures, Algorithms and System Design

- **Manchester Metropolitan University** : 2015 - 2019 ○ BEng (Hons) Mechanical Engineering | Manchester, UK

- **Awards** 🏆 :   ○ Carbon Literacy ○ Hour of Code ✹ | **Hobbies**: *Chess* ♘ *Sound Design* ♪ *Music Production* ♫