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TECH PROJECTS

ROBOT IN RESIDENCE

2022

- Built three proprietary robotic applications using the Naoqi Python SDK for machine vision, dialogue, and obstacle detection and avoidance in static environments.
- Implemented efficient perception, decision-making, and control algorithms.
- Established robust data pipelines to manage sensors and actuators, including cameras, microphones, and motors.
- Demonstrated a strong command of robotics and algorithmic programming within a real-world setting.

BANGMA DISEASE PREDICTION MODEL

2023

- Developed a disease prediction model, called Banga, using Python's scikit-learn and the Pandas library.
- Meticulous data preprocessing included removing duplicates, transforming categorical variables, and splitting the dataset.
- Implemented the Decision Tree Classifier algorithm to capture complex relationships and achieve robust and accurate predictions.
- Achieved remarkable performance with 100% accuracy in training and testing, along with precise precision, recall, and f1-score measures.
- Link: <https://hamza.dataflrr.com/portfolio/disease-prediction-using-decision-tree-classifier/>

BLOOMPOOL

2022

- Developed a cutting-edge solution called Bloompool that revolutionizes crop cultivation.
- Utilized AI and to enable farmers to grow crops in a water-nutrient mixture, reducing reliance on machinery and fertilizers.
- Employed sensor technology to collect valuable data for informed decision-making.
- Programmed robots to autonomously carry out actions based on predefined logic.
- Presented the solution at the Artificial Intelligence for Good Innovation factory by the International Telecommunication Union.
- Mention: <https://aiforgood.itu.int/speaker/bloompool/>
- Presentation: <https://youtu.be/xOVLAAaMoTnM>

GPT4 CHAT APP

2023

- Created a chat app using React, Node.js, Express, OpenAI GPT-4 API, React-Redux Toolkit, and Tailwind CSS.
- Offered a seamless chatting experience with a responsive UI.
- Leveraged natural language processing capabilities to generate intelligent responses.

- Demonstrated expertise in frontend and backend development, API integration, state management, and UI design.
- Link: <https://hamza.dataflrr.com/portfolio/full-stack-mern-chat-app-powered-by-gpt4/>
- Github: <https://github.com/Hikky99/GPT4-chat-app>

EA TRANSPORT

2019

- Co-developed a ride hailing transport app to facilitate movement of people and freight in the Upper East Region of Ghana
- Team Acquired US\$5000 from Ford Mobility Innovation Fund for further development and additional US\$5000 for travel to San Jose, California

99SCIENCE

2019

- Develop and run this science blog
- Combined scientific passion and technological expertise to bring a distinctive perspective and drive innovation.
- Link: <https://99science.org>

RESEARCH EXPERIENCE

SENIOR THESIS

- Title: Agrobiodiversity of Home Gardens in the Kassena-Nankana Municipality (KNM) of the Upper East Region (UER) of Ghana, 2018
- Collected geographic data and taxonomic data of gardens and generated heat maps.
- Compared abundances, frequencies, and species composition of taxonomic families

PROJECT ANIMAL FEED

- Design and Synthesis of Animal Feed to Minimize Bushfires and Carbon Emissions, 2018-2019
- Designed a formula containing z-3-hexenal, antimicrobials, and antioxidants to restore aroma and mitigate microbial activity
- Minimized bushfires, carbon emissions, and soil nutrient loss due to fires
- Secured \$3000 funding from Ford Motor Company Fund through Ford C3
- Project further won, GH\$25000 from the Government of Ghana under a different team lead
- Featured in Vice Chancellor's Annual Report:
<http://udsspace.uds.edu.gh/bitstream/123456789/2507/1/VICE-CHANCELLOR%27S%20REPORT%2C2018.pdf>

ENACTUS (TEAM ENGINEERING) PROJECTS

2017-2018

- Lead designer of instant coffee from honey, lime, and moringa (Enactus Insta Coffee)
- Modified an existing rice thresher (Sumathresh) for improved ergonomics in communities without electricity access.
- Accelerated the decomposition period for existing organic fertilizer project.

INTERNSHIP

2017

- Effects of Bradyrhizobium Inoculants on Different Cropping Systems, Savanna Agricultural Research Institute
- Studied the influence of inoculants on various crop systems
- Assessed the effects of inoculants on soil health and microbiology

THIRD TRIMESTER FIELD PRACTICAL PROGRAMME

2015-2016

- Profile of the Dabomsa Community in the Builsa South District of the UER
- Gathered ecological information of a rural community
- Identified root and core problems of the community

PRESENTATIONS

- Divesity in AI, Promoting Local Content, Presented at Google AI Headquarters, Accra, ghana. April 26, 2023
- Home Gardens are Hotspots of Biodiversity and Conservation, Poster presented at: 2021 EEB Scholars; October 2021; Princeton University
- Home Gardens are Hotspots of Biodiversity and Conservation, Poster presented at: 2021 EEES Scholars; September 2021; Dartmouth College
- Breaking the Wall of Paucity of Science and its Services, Presented at: Falling Walls Lab Ghana; September 2020; University of Ghana. Won Audience Choice Award.
- Annual Project Impact (Sumathresh, Insta Coffee, Leninpa Organic Fertiliser), Presentation at: Enactus National Championship; July 2018; Accra International Conference Centre

ACHIEVEMENTS AND AWARDS

- 2021 EEB Scholar, Princeton University
- 2021 EEES Scholar, Dartmouth College
- Winner (part of team), \$5,000 (team travel) + \$5,000 (project grant) Ford Mobility Innovation Challenge for the development of a transport software for rural transportation
- Awarded £10,000 Think Big Postgraduate Scholarship by the University of Bristol, UK (declined)
- Winner (team lead), \$3,000 Ford College Community Challenge (C3) Cycle 5 to minimize ecological disturbances caused by bushfires. Producing high-quality animal feed from bush using a formula containing z-3-hexenal
- Winner of Biological Science Students Association of Ghana (BIOSSTAG) annual academic debate on the ecological impacts of specific lentic ecosystems on rural health
- Winner of BIOSSTAG academic debate on linking genetic engineering and food security

WORK EXPERIENCE

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| • System Engineer, Brightway Tuition Service | 2020-present |
| • Robotic Engineer, Goethe-Institut, Accra | 2022-2023 |
| • Teaching Assistant, University for Development Studies | 2018-2019 |