HAMZA MOHAMMED

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TECH PROJECTS

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.
- Employed styling techniques to enhance the visual appeal and professionalism of the prediction results.
- GitHub Link: https://github.com/Hikky99/

ROBOT IN RESIDENCE 2022

- Developed three robotic applications using the Naoqi Python SDK and Choregraphe.
- Designed applications to facilitate interactive conversations between humans and machines, identify objects, and enable motion in static environments.
- Implemented efficient solutions for perception, decision-making, and control using algorithm development.
- 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.
- GitHub Link: https://github.com/Hikky99/

BLOOMPOOL 2022

- Developed a cutting-edge solution called Bloompool that revolutionizes crop cultivation.
- Utilized AI and robotics 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/xOVLAaMoTnM

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.
- GitHub Link: https://github.com/Hikky99/

99Science

- Bridged the gap between complex scientific concepts and a wider audience through accessible and captivating content.
- Distilled profound insights into articles that cover a wide range of scientific topics.
- 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 data on species composition of gardens
- Conducted mapping of garden species in KNM
- Gathered site-specific taxonomic data
- 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
- Produced animal feed from bushes
- 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, GHS25000 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
- Presented virtually at Princeton University Dartmouth College EEB/EEES Scholars Programme.

ENACTUS PROJECTS (TEAM ENGINEERING AND ENTREPRENEURSHIP PROJECTS) 2017-2018

- Lead designer of animal feed project (see above)
- 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

- 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 (Received the Audience Choice Award out of 15 presenters)
- 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

TEACHING AND WORK EXPERIENCE

- Biology Teacher, Pentecost Senior High School, Koforidua, 2021-present
- Editor (Blog), 99Science.org, 2019-present
- Biology Teacher, Ghana Lebanon Islamic School, 2019-2021
- Science and Math Teacher (Part-time), Talent Restoration Academy, Lapaz, 2021
- Biology and Mathematics Teacher (Part-time), Thought College, Accra, 2020
- Integrated Science and Math Teacher (Part-time), 7As Academy, 2019
- Upper East Regional Coordinator (Part-time), Pesewa Virtual Internship, 2019
- Teaching Assistant, University for Development Studies, 2018-2019

LEADERSHIP

- Co-patron, Innovation, Creativity & Entrepreneurship, Ghana Lebanon Islamic School, 2020-2021
- President (2018/2019), National Service Personnel Association, KNM
- President, Enactus, UDS-Navrongo Campus, 2017-2018
- Secretary, Academic Board (2017/2018) of BIOSSTAG
- Co-chair, Health and Research Committee, University Students' Parliament House of the University for Development Studies, Navrongo campus