

# Nathaniel Asiak

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## EDUCATION

- **Academic City University College** Accra, Ghana  
*BSc - Electrical Engineering; GPA: 3.94/4.0* September 2018 - August 2022  
*Courses: Probabilistic Systems Analysis, Applied Linear Algebra, Numerical Methods, Artificial Intelligence, Machine Learning*

## RESEARCH EXPERIENCE

- **Undergraduate Thesis, Supervisor: Dr. Stephen Armah** Sept 2021 - May 22  
*Heart Sound Classification using an ensemble classifier*
  - **Results:** Built an Adaboost classifier with a training accuracy of 93% and test accuracy of 86%.
  - **Feature Selection:** Applied non-parametric NCA algorithm to select 13 features out of 27 extracted time and frequency domain audio features
  - **Training:** Sped up training time almost 0.25X via data compression
  - **GUI:** Built a GUI application for interactive recording, visualizing, and receiving classifications for heart sounds.
- **Locovent4Africa Lab, Supervisor: prof. Fred Mcbagonluri** Mar 2020 - May 2022  
*Investigating efficient ventilator alternatives*
  - **Implementation:** Built firmware to establish i2c communication between different sensors and microcontrollers on the control circuit. of an emergency-use ventilator.
  - **Modelling:** Developed mathematical transfer models and closed loop models for the control system for optimal motor movement to reduce power consumption.
  - **Impact:** Spoke on BBC - Ghana Students Build Low-Cost Ventilators to Fight COVID-19.
- **KwameAI** Volunteer  
*Investigating performance of LLM on legal data* August 2023 - Present
  - **EsqAI -Accuracy Experiments:** Measuring the accuracy of LLM models on generating case briefs from legal data against benchmarks from in-house experts.
  - **EsqAI - Generating case briefs:** Investigating the reliability of case briefs generated from applying data augmentation techniques to LLM
  - **Prompting:** Prompt engineering to determine the optimal prompt for generating case briefs

## PROFESSIONAL EXPERIENCE

- **Jetstream Africa Limited** June 2022 - Present  
*Software Engineer*
  - **Jetvision:** Developed REST APIs for supply chain visibility products used by customers in 14 African countries
  - **JetAssist:** Led research, fine-tuned and integrated GPT-3 agents into the supply chain platform to execute actions and provide updates in real-time.
  - **Optimization:** Wrote optimized SQL queries that reduced system latency by 20%
- **FirstLove Church.** August 2022 - Present  
*Software Engineer (Volunteer)*
  - **Admin Portal:** Implementing the GraphQL server and schema to handle client queries and mutations.

## PROJECTS

- **Movie recommender:** Developed and deployed a KNN-based movie recommender system on Streamlit [[code](#)][[Demo](#)]
- **Modelling, Simulation, and Optimization of 5-DOF Robotic Arm:** Modelled, and optimized the trajectory of a 5-DOF robotic arm in Matlab/Simulink using Inverse Kinematics
- **Connect4 Multiplayer Game:** A websocket browser-based multiplayer Connect4 game with support for spectators built in python [[code](#)][[Demo](#)]

## SKILLS SUMMARY

- **Languages:** Python, PHP, C++, TypeScript, SQL
- **Frameworks:** Scikit, NLTK, SpaCy, TensorFlow, Laravel, FastAPI, Langchain
- **Tools:** Docker, AWS, Git, PostgreSQL, MySQL, SQLite, Neo4j, GraphQL

## REPORTS AND PRESENTATIONS

- **Poster: Digital Stethoscope with Machine Learning.:** Locovent4Africa Medical Technology Fair 2022[[Poster](#)]
- **Report: Modelling and Simulation of 5-DOF Robotic Arm:** [[Report](#)]
- **Thesis: Design and Construction Of a Digital Stethoscope With Machine Learning:** Work in Progress to publish results of machine learning experiments [[Thesis](#)]

## HONORS AND AWARDS

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- Finalist JPMorgan Hackathon(*1 of 7*), Deep Learning Indaba 2023 - [2023]
- Best Graduating Student, Department of Computer and Electrical. Eng., Academic City College - [2022]
- Jetstream Growth Employee of the year - [2022]
- Stanford Exposure to Research and Graduate School Scholar(*1 of 30 scholars worldwide*) - [2021]
- Honors List, Department of Computer and Electrical. Eng., Academic City College - [2018 - 2022]
- Best BECE candidate (*1 of 20 awardees nationwide*) - [2016]

## VOLUNTEER EXPERIENCE

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- **Code In Place - *Stanford University*(2023)**
  - *led a group of 15 diverse students through the first half of Stanford's flagship Intro to Python course, CS106A.*
- **Summer Bootcamp - *ELiTE* (2019)**
  - *taught high school students computer science basics.*