The CV of

MR. SAFIU SUMANI BENIN

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Portfolio: Safiu Benin | Biomedical Engineer

EDUCATION

University of Ghana, Accra, Ghana
B.Sc. Biomedical Engineering | January 2022 – September 2025
CGPA: 3.84/4.0

Thesis: *Automated Segmentation and Classification of Tumour Masses and Calcifications for Early Breast Cancer Detection*

Relevant Coursework

Programming for Engineers (Python Programming), Statistics for Engineers, Numerical Methods, Engineering Graphics with CAD, Biomedical Engineering Systems, Bioinstrumentation, Medical Imaging, Medical Signal & Image Processing, Biomechanics, Biomaterials, Design and Selection of Biomaterials, Design of Mechanical Systems, Cell and Molecular Biology, Tissue Engineering, Research Methods, Bio-photonics, Anatomy and Physiology, Engineering Principles of Anatomy & Physiology, Bioelectronics, Biophysics, Bioinformatics, Medical Physics.

Nandom Senior High School, Nandom, Ghana
General Science Program | September 2018 – October 2021
WASSCE Aggregate: 10

Relevant Coursework

Core Subjects	Elective Subjects
• English Language	• Physics
• Integrated Science	• Mathematics
• Mathematics	• Chemistry

- Social Studies
- Biology

WORK EXPERIENCE

Operation Smile – Medical Mission Intern **| Koforidua, Ghana | June 2024 (8-day intensive mission)**

- Set up operating room (OR) theatres daily alongside the Biomedical Engineering lead.
- Performed maintenance, cleaning, packing, and minor repairs of mission equipment and surgical tools.
- Conducted safety checks and functionality testing on biomedical devices prior to procedures.
- Supported equipment logistics, including inventory management, allocation, and end-of-day shutdown procedures.

ML/AI & Molecular Docking Intern
Department of Biomedical Engineering, University of Ghana, Accra, Ghana | March–April 2024

- Executed a capstone project on prostate cancer detection and segmentation using Machine Learning and Deep Learning.
- Performed molecular docking of protein–ligand complexes using AutoDock and PyRx.
- Completed daily ML and DL exercises, implementing small models and tasks.

Biomedical Engineering Intern
Upper West Regional Hospital, Wa, Ghana | September–October 2023

- Set up operating room equipment for daily surgical use.
- Conducted daily ward rounds to inspect and verify equipment functionality across hospital departments.
- Operated the hospital's oxygen plant for two weeks, assisting in oxygen production and quality checks.
- Assisted in troubleshooting and repairing a dental X-ray machine and recalibrating steam sterilisers/autoclaves at the CSSD.

SCHOLARSHIPS & HONOURS

- Educational Pathways International (EPI) Scholar: A competitive scholarship awarded based on academic excellence and leadership potential.

- Awarded the Dean's Academic Excellence Award for the BSc Biomedical Engineering Programme

LEADERSHIP & ACTIVITIES

Head, Financial Committee | Engineering Students of the University of Ghana (ESUG), Accra, Ghana | 2023–2024 Academic Year

- Oversaw budgeting, dues management, and financial planning for engineering student activities.
- Coordinated financial logistics for events, workshops, and student initiatives.

Course Representative (Level 100–300) | Biomedical Engineering Class of 2025, University of Ghana

- Served as liaison between faculty and students
- Communicated academic updates and coordinated coursework-related issues.

Public Relations Officer | Sissala Students Union, University of Ghana Chapter, Accra, Ghana

- Managed communications, publicity, and engagement strategies for student events and programs.

Co-Founder — Student Study Group

- Organised peer-learning sessions and collaborative academic support for engineering students.

Nandom Senior High School — Nandom, Ghana

- *House Prefect*
- *Organiser—Science and Maths Quiz Club*

Volunteer Teacher | Bandei Community Basic School – Community Volunteering

MEMBERSHIP IN PROFESSIONAL ASSOCIATIONS

VISPAD Research Team

- Ghana Society of Biomedical Engineers (GSBE-UG Chapter)
- Engineering Students of University of Ghana (ESUG)
- Ghana Muslim Students Association (GMSA)

PROJECTS

Electronic Health Records System (EHRS) | BMEN 202 – Introduction to Biomedical Engineering, Semester Project, 2022/2023

Tools: *Python, HTML, CSS, SQL, PowerPoint, Word*

- Developed a web-based EHRS for efficient doctor–patient interaction and secure data storage.
- Designed patient and doctor portals for appointment scheduling and data requests.

Wheelchair Design for Persons with Disability

SENG 105 Engineering Graphics with CAD & SENG 107 Introduction to Engineering | 2022/2023

Tools: *SolidWorks, PowerPoint, Word*

- Designed a complete CAD model of a wheelchair in SolidWorks.
- Applied engineering design principles and delivered a full technical design report.

Quantification of CO Emissions & Eco-Friendly Coal Pot Design | BMEN 315 – Research Methodology, Semester Project, 2023/2024

Tools: *PowerPoint, MS Word*

- Researched quantification methods for CO emissions from traditional coal pots.
- Proposed a Fe_2O_3-based coal pot design to minimise CO exposure and emissions.

Mobile IV Delivery System for Enhanced Patient Mobility | BMEN 306 – Design and Selection of Biomaterials, 2023/2024

Tools: *SolidWorks, Fusion 360, PowerPoint, Word*

- Designed a mobile IV delivery system using the engineering design process.
- Created mockups and conducted Finite Element Analysis (FEA) using SolidWorks and Fusion 360.

Adjustable Ankle Orthotic Shoe Lift for LLI Patients | BMEN 308 – Design of Mechanical Systems, 2023/2024

Tools: *SolidWorks, Fusion 360, PowerPoint, Word*

- Designed an adjustable ankle orthotic shoe lift for patients with leg-length inequality (LLI).
- Performed material selection and conducted FEA simulations.

Refrigeration System for Everlasting Morgue Consortium (Benchmarking Study) | BMEN 322 – Local Issues in Biomedical Engineering, 2023/2024

Tools: *Excel, SolidWorks, PowerPoint, MS Word*

- Researched industry refrigeration systems and created a benchmarking framework.
- Selected optimal brands and produced CAD models of the top recommendations.

Low-Cost SMS-Enabled Telemetry System for Detecting Febrile Hypoxia | BMEN 416 – Telemetry and Telemedicine, 2024/2025

Tools: *Arduino, Hubtel API, SolidWorks*

- Programmed Arduino microcontroller for physiological monitoring.
- Integrated Hubtel SMS API for remote data access and alerts.
- Designed a device housing model using SolidWorks.

Thoraco Lumbo Sacral Orthosis (TLSO) – CASH Brace Design | BMEN 422 – Orthotics and Prosthetics, 2024/2025

Tools: *SolidWorks, Fusion 360*

- Reverse-engineered the Cruciform Anterior Spinal Hyperextension (CASH) brace.
- Created a full 3D design model using SolidWorks and Fusion 360.

Automated Segmentation & Classification of Breast Cancer Tumours and Calcifications | BMEN 400 – Final Year Project, 2024/2025

Tools: *Python, PyTorch, Kaggle, Google Colab, HTML, CSS*

- Collected and preprocessed datasets from INBreast and CBIS-DDSM.
- Built ML models for tumour and calcification segmentation and classification.
- Deployed the model through a web application for clinical integration.

SKILLS & INTERESTS

Technical Skills: Python (PyTorch, TensorFlow, OpenCV), Arduino, SolidWorks, Fusion 360, Proteus, PyMOL, PyRx, MODELLER, AutoDock

- **Laboratory & Engineering Skills:** Imaging analysis, Signal analysis, Biomedical equipment troubleshooting, Engineering Design, Research
- **Languages:** English (Official Language), Local Languages: Sissali (fluent), Twi (beginner)
  Interests: Casual Mobile Gaming,

REFEREES

Would be provided upon request