Johannes Shikongo Alfred

Electronic and Computer Engineering graduate
Contact : +264 81 236 5554 | ALFREDCHICCO@GMAIL.COM
Portfolio : LinkedIn | GitHub | Website

Professional Summary

Passionate and driven Electronics and Computer Engineering student with expertise in software development, digital electronics, and cybersecurity. Strong background in **programming, embedded systems, and AI models**, with a proven track record of developing machine learning models, hardware prototypes, and real-world software applications. A dedicated problem-solver eager to innovate and contribute to advancements in technology.

Key Skills & Competencies

Here's a well-structured table for your skills: software dev., ml and ai, database management, embedded ssytems, system analyses and design, computer networs, hardware prototyping, project management, iot and cloud computing, robotics and automation, data structures and algorithms, tutoring

Category	Skills
Programming Languages	C, Python, C#, HTML, VHDL, Assembly, Flutter, **C++, Java, MATLAB**
Software Development	Full Stack Development, UI/UX Design, Software Deployment, NodeJS, Mobile App Development, **Git, Docker, CI/CD**
Machine Learning & AI	CNN, SVM, RVM, FL-DenseNet, Model Evaluation, **TensorFlow, PyTorch (Basics)**
Database Management	SQL, MySQL, MongoDB, T-SQL Queries, Data Modelling
Embedded Systems	Microcontroller Programming (Atmega328, Arduino, FPGA), Sensor Integration, **Embedded Linux, Device Drivers, RTOS**
System Analysis & Design	Debugging, Testing, UML Diagrams, Technical Documentation, **Computer Architecture & Organization**
Computer Networks	Network Development, Security, System Vulnerability Assessment, **Networking Protocols (TCP/IP, MQTT), Cybersecurity Fundamentals**
Hardware Prototyping	PCB Design, Digital Electronics, Circuit Analysis, **3D Printing, CAD Tools (if applicable)**

Project Management	Research, Documentation, Collaboration
Operating Systems	Linux, Windows, RTOS
IoT & Cloud Computing	AWS, Azure, MQTT, Embedded IoT Systems
Robotics & Automation	ROS (as a plus), Industrial Automation Basics
Data Structures & Algorithms	Optimized Problem-Solving, Algorithm Design
Tutoring	

Education

BSc in Electronics & Computer Engineering

José Eduardo dos Santos UNAM Engineering Campus | [September 2025]

Work Experience

Intern Electronic automation Technician

EcoProjects Automation | November 2024 – February 2025

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Description

I specialized in industrial automation and energy solutions, focusing on PLC programming (Allen Bradley, Modicon) and SCADA/HMI systems (Citect, Historian) to design and commission control systems for mining, water treatment, and energy sectors. I worked on integrating field devices (sensors, actuators) and telemetry networks, while contributing to energy efficiency projects like alternative energy integration (solar, hybrid systems) and power factor correction.

My role involved collaborating with multidisciplinary teams to automate different process from mineral extraction processes, optimize water treatment plants, and integrate renewable energy into grid systems. I also honed skills in process instrumentation (flowmeters, pressure transmitters) and vendor-specific certifications (Rockwell Automation, Schneider Electric, Yokogawa), ensuring seamless execution of large-scale projects through troubleshooting and project management.

Intern Electronic marine and communication Technician

Radio Electronics Pty Ltd. | November 2023 – January 2024

- Assisted in troubleshooting and maintaining marine electronic systems.
- Implemented new systems for communication.
- Implemented wireless communication for inland clients
- Troubleshooting networks and wireless communication [inland and sea].
- Gained hands-on experience in hardware integration and debugging.

Description

During my time at Radio Electronic (PTY) Ltd, I specialized in marine electronics and satellite communications, designing and integrating navigation systems, power equipment, and hybrid energy setups (e.g., solar inverters, Victron Energy systems) for maritime and off-grid applications. I contributed to radio network engineering, deploying VHF repeaters and digital radio networks (Motorola MotoTrbo™, TETRA) for mining, government, and corporate clients, while collaborating on IoT-enabled automation for maritime systems and wireless broadband solutions (Blue Air Fibre). My role involved satellite communications (Inmarsat services) and energy efficiency projects, aligning with the company's expansion into deep-sea/offshore sectors.

I honed hands-on skills in electronics repair, system troubleshooting, and adhered to vendor-specific certifications (e.g., Motorola, Victron), ensuring seamless execution of projects across Namibia's coastal and inland regions.

Student Assistant (Software & Hardware Courses)

University of Namibia | March 2023 – November 2023

- Provided academic support in software development and digital electronics courses.
- Assisted students with C/python/HTML/JavaScript (and more) programming, microcontroller programming, digital circuits creation and understanding and system debugging.
- Supervised CRUD applications and evaluated them too.

The modules in question where; Computer programming 1, Computer programming 2, Digital Electronics

Data Collector

Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) | May 2021

- Collected and analyzed data for the GIZ nambian body.
- We where tasked with collecting data from the namibian citizens from different locations; Ongweidiva, Oshakati, Ondangwa.
- Maintained data integrity and accuracy in large datasets.

Description

Goods Distributor Assistant

Janeko Investment CC | December 2020 – February 2021

- Assisted in inventory management and logistics.
- Ensured accurate stock handling and delivery processes.

Projects & Technical Experience

1. Programming Languages

Skill	Project

C	- **Embedded Temperature Logger** (STM32 + Sensors + UART logging) - **Custom Linux Kernel Module** (e.g., a simple driver)
Python	- **IoT Data Analyzer** (Flask/Django dashboard for sensor data) - **Automated PCB Tester** (PySerial + OpenCV for defect detection)
C++	- **Real-Time Object Tracker** (OpenCV + Raspberry Pi) - **Robotic Arm Controller** (ROS + Arduino/C++)
Java	- **Android App for Bluetooth Device Control** - **Desktop App for Serial Port Monitoring** (JavaFX)
MATLAB	- **Audio Signal Filtering Tool** (Noise removal using FFT) - **Motor Control Simulation** (PID tuning for drones/robots)
VHDL	- **FPGA-Based PWM Generator** - **Simple CPU Design** (Documentation-heavy if no FPGA available)
C#, .Net	

2. Software Development

Skill	Project
Full Stack Dev	- **IoT Dashboard** (Node.js + React + MongoDB for sensor data) - **Portfolio Website** (With interactive electronics projects showcase)
Git/Docker/CI-CD	- **Automated Build Pipeline** for a Python/Embedded project - **Dockerized Microservice** (e.g., API for sensor data)
Mobile Dev (Flutter)	- **BLE-Enabled Home Automation App** - **Sensor Data Visualizer** (Firebase backend)
Flutter (Cross-Platform)	1. **BLE Home Automation App** – Control ESP32/Arduino devices via Bluetooth. 2. **Sensor Data Visualizer** – Display real-time IoT sensor readings (Firebase/API backend).
Native Android (Java/Kotlin)	1. **Serial Port Terminal App** – Communicate with microcontrollers via USB OTG. 2. **Wi-Fi Scanner** – Map network strength with RSSI analysis.
iOS (Swift) *(if macOS available)*	1. **AR Circuit Builder** – Use ARKit to visualize electronic circuits. 2. **ML-Powered Audio Classifier** – CoreML + TensorFlow Lite for sound detection.
Backend for Mobile	1. **Auth + API for App** – Node.js/Firebase user auth + data sync. 2. **Offline-First App** – SQLite + sync with cloud on reconnect.

3. Machine Learning & AI

Skill	Project Ideas

CNN/TensorFlow	- **PCB Defect Detection** (Custom CNN + OpenCV) - **Gesture-Controlled Robot** (Camera input + ML model)
SVM/RVM	- **EEG Signal Classification** (Documentation-heavy) - **Predictive Maintenance** (Vibration sensor data analysis)

4. Embedded Systems

Skill	Project Ideas
RTOS/Embedded Linux	- **Multithreaded Sensor Hub** (FreeRTOS on ESP32) - **Custom Linux Distro** for Raspberry Pi (Yocto Project)
Device Drivers	- **LED Matrix Driver** (Kernel module for Raspberry Pi) - **Documentation**: "How Linux Device Trees Work"

5. Hardware Prototyping

Skill	Project Ideas
PCB Design	- **ESP32 Power Monitor** (KiCad + Custom PCB) - **Haptic Feedback Glove** (Flex sensors + PCB)
3D Printing/CAD	- **Robotic Chassis** (Fusion 360 + 3D printed) - **Drone Frame Optimization** (Stress analysis doc)

6. IoT & Cloud

Skill	Project Ideas
AWS/Azure	- **Cloud-Based Smart Farm** (Soil sensors + AWS IoT Core) - **Predictive Maintenance System** (Azure Functions + Telemetry)
MQTT	- **Home Automation Hub** (Raspberry Pi + Node-RED) - **Industrial Sensor Network Simulator**

7. Computer Networks & Security

Skill	Project Ideas
Cybersecurity	- **Pen-Testing Lab** (Write-up on VLAN hopping) - **Secure Firmware Update** (ECDSA signing on ESP32)
Network Protocols	- **CAN Bus Sniffer** (Raspberry Pi + Python) - **Custom TCP Stack** (Documentation-heavy)

8. Robotics & Automation

Skill	Project Ideas
ROS	- **Autonomous Rover** (SLAM + Gazebo simulation) - **Robotic Arm Pick-and-Place** (MoveIt + Arduino)

9. Documentation Alternatives

For skills like **Computer Architecture** or **Algorithms**:

- Write a **whitepaper** on RISC-V vs. ARM.
- Create a **GitHub repo** with optimized implementations of sorting/searching algorithms.

Next Steps:

1. **Pick 3-5 projects** to start with (mix hardware/software).
2. **Document them thoroughly** (GitHub READMEs, blog posts, videos).
3. **Show progression** (e.g., start with Arduino, move to ESP32, then FPGA).

Would you like help prioritizing projects based on job roles (e.g., embedded vs. ML)?

Machine Learning & AI Projects

Water Leak Detection Using CNN, SVM, RVM, and FL-DenseNet

- Developed a **CNN-based model** for water leak detection using structured link and node data.
- Implemented an **FL-DenseNet model** for multi-class classification.
- Trained and evaluated models using **F1 Score, Accuracy, Precision, Recall, AUC-ROC, AUC-PR, Log Loss, and MCC**.
- Designed **graphs for training/validation metrics** and confusion matrix analysis.
- Integrated **SVM and RVM models** for comparison against CNN-based approaches.

Work source:

Embedded Systems & IoT Projects

Theft Detection & Deterrence System for Vehicles

- Designed a system to detect and prevent car mirror theft using **MPU6050 sensor**.
- Integrated **3 ultrasonic sensors, LEDs, an MPU6050, and a GSM SIM800L module**.
- Developed a custom **PCB for Atmega328 microcontroller**.
- Implemented **real-time monitoring, motion detection, and alert systems** via SMS.
- Optimized pin allocations for GSM module integration.

Work source:

Software Development Projects

Inventory Management System (C# & SQL)

- Developed a Windows-based inventory system using **C# .NET and SQL Server**.
- Designed an intuitive UI and implemented **T-SQL queries** for data handling.

- Developed a small C# application with **unit tests using NUnit/xUnit**.
- Identified and fixed **memory management and logic errors**.
- Documented debugging strategies and performance enhancements
- Created **technical documentation and user manuals**.

Work sources

Certifications & Training

In order to be able to complete the projects, the following is a list of the certifications and training i had to go through in order to obtain the insights and undrstanding needed.

Category	Tools & Technologies
IDEs	Visual Studio, PyCharm, Jupyter Notebook, Arduino IDE, Microsoft Visual studio
Version Control	Git, GitHub
Embedded Systems	Arduino, Atmega328, SIM800L GSM
Machine Learning Tools	TensorFlow, Scikit-learn, Matplotlib, Pandas

Technical Tools & Frameworks

From the many projects done, below is a listing of the tools used, mastered and handled to create them.

Category	Tools & Technologies
IDEs	Visual Studio, PyCharm, Jupyter Notebook, Arduino IDE, Microsoft Visual studio
Version Control	Git, GitHub
Embedded Systems	Arduino, Atmega328, SIM800L GSM
Machine Learning Tools	TensorFlow, Scikit-learn, Matplotlib, Pandas

Achievements & Leadership

- Successfully developed a **CNN model** for water leak detection in final-year research.
- Designed a **hardware prototype** for a car theft detection system, making technological contributions to security systems.
- Recognized for **problem-solving and analytical skills** in software development and hardware design.

Languages

- **English** (Fluent)
- **Portuguese** (Basic)

References

Available upon request.