

ELVIN E. MAZWIMAIRI (ELECTRICAL DESIGN ENG)

PERSONAL SUMMARY

Motivated Graduate Engineer with a foundation in power electronics, industrial systems design, maintenance, protection, and control. I possess hands-on experience in electronics design, electrical power machines, renewable energy (solar, and BESS), and electrical distribution systems. Proficient in MATLAB/Simulink, AutoCAD Electrical, ETAP, and modern coding frameworks. Passionate about designing, developing, and implementing efficient, reliable systems that drive performance and reliability.

BASIC INFORMATION

Date of Birth: 26/11/2000	Driver's License: Class 4 (Clean)
Gender: Male	Languages: English, Shona
Marital Status: Single	Religion: Christianity

SKILLS

CAD & Software	Electrical	Soft & Other
AutoCAD Electrical. MATLAB/Simulink. DIgSILENT PowerFactory. Altium Designer. PSCAD, ETAP. Python, JS, C/C++. NI Multisim, SPICE. LabVIEW. Ms. Office Suite.	Control and Power Systems Modelling & Analysis. Protection Scheme Design. Electronics and Circuit Design, Prototyping & Testing. Renewable Energy Systems – Solar + BESS + Grid Integration. Power System Sizing & Analysis. SLDs, P&IDs, Schematics Design.	Research Oriented; Capable Leadership. Effective communication. Creative Independent Thinker. Collaborative Team Player. Adaptable and Self-Motivated. Software-Based Systems. Creative Design

WORK EXPERIENCE

Systems Design Engineer, Mazenel Industries, Freelance, Zimbabwe (October 2024 – Present)

- 🔧 Conducting renewable-energy system design: site shading analysis, feasibility & ROI studies, PVsyst/AUTO-CAD array layouts, single-line diagrams, and energy-yield simulations.
- 🔧 Preparing technical specifications, interconnection drawings, and equipment schedules; ensuring compliance with IEEE, NEC, and local utility regulations.
- 🔧 Sizing and integrating battery-storage solutions: configuring charge controllers, inverters, and BMS to maximize self-consumption and backup capacity.
- 🔧 Integrated Systems design, simulation, and optimization.

Electrical Engineering Intern, Delta Beverages, Harare, Zimbabwe (March 2023 – August 2023)

- ✚ Assisted with servicing of plant electrical systems, including motors and generators, equipment control panels, and plant power distribution systems.
- ✚ Assisting with maintaining power machinery, troubleshooting faults, and performing repairs.
- ✚ Supporting procurement and inventory management of engineering equipment accessories.
- ✚ Preparing plant reports and presentations to communicate plant metrics to higher management.

Motor Rewinding Technician Assistant, Elgen Electrical, Harare, Zimbabwe (Jan 2023 – Mar 2023)

- ✚ Performing insulation resistance (megger) and continuity (multimeter) tests to diagnose motor/generator faults.
- ✚ Assisting in dismantling, rewinding, and reassembling rotors and stators, ensuring precision coil placement and insulation integrity.

Projects Research & Development Officer, Enactus Uz, Harare, Zimbabwe (Aug 2021 – August 2022)

- ✚ Researching and developing initiatives for new projects, conducting feasibility studies, and technical assessments.
- ✚ Collaborating with cross-functional teams to develop prototypes, manage on-site project activities, and provide technical assistance.
- ✚ Preparing technical reports and presentations to communicate project findings and recommendations.

EDUCATION

BSc (Hons) in Electrical Engineering (Upper Second Class), University of Zimbabwe, Harare, Zimbabwe | Aug 2019 – June 2024

- ✚ Relevant coursework - **Electrical Machines, Control Systems, Systems Modelling, Load Flow Analysis, Power Systems and Energy Conversion, Analog, Digital, and Power Electronics, Measurements and Instrumentation, Circuit Design, Programming, Embedded Systems**

ZIMSEC Advanced & Ordinary Level Certifications, Mandedza High School, Seke, Zimbabwe | 2013- 2018

- ✚ **A Level:** Pure Mathematics (A), Physics (A), Chemistry (A), Computer Science (A)
- ✚ **O Level:** 9 A'S & 1 B (Inclusive of English, Maths & Science)

PROJECTS

Optimizing Battery Energy Storage System (BESS) Performance for Real-Time Grid Stability and Intensive Renewables Integration (MATLAB/Simulink + Xilinx Vivado + DIgSILENT PowerFactory) – October 2024 – March 2025

- ✚ Designed an FPGA-based control system to optimize BESS performance for enhanced grid disturbance response, stability, and active prevention in renewables-intensive grids.
- ✚ Tested the behavior of a renewables-connected grid + BESS, with and without FPGA optimization, meanwhile monitoring grid stability parameters, BESS state of health, and BESS responses to grid disturbances.

Off-Grid, Versatile Portable Power System with AC & Solar Charging (Altium + KiCAD) – Dec 2024 to Present

- ✚ Designed a versatile off-grid, portable power system with solar and AC charging capabilities, providing a sustainable energy solution for off-grid usage as well as “readily available” and mobile power backups for “out of power” and “on the road” situations.
- ✚ Involved in constructing the battery pack, designing the Battery and System Management Circuits, and implementing power supply and delivery circuits (push-pull, H-bridge, and other configurations) as well as load and user interfaces with the system.

Real-Time Monitoring and Adaptive Protection of Renewable Energy Systems (RES) for Grid Stability Enhancement (Simulink) – Jan 2025 to March 2025

- ✚ Designed a real-time interactive monitoring and adaptive protection system for RES-integrated grids, focusing on enhancing grid code compliance and dynamic fault response.
- ✚ Simulated critical AC/DC-side fault scenarios and implemented adaptive undervoltage/overvoltage relays and DC fault isolators to evaluate their effectiveness.
- ✚ Assessing system response under varying levels of RES penetration, improving operator situational awareness and response time.

Design of an FPGA-Based Real-Time Control System for Automated Optical Inspection System in Packaging Quality Control (AutoCAD Electrical + VivadoFPGALab + Python/C) – Aug 2023 to May 2024

- ✚ Developed and implemented a cost-effective, AI-powered system for inspecting the inside of packaging containers on high-speed production lines. Using FPGA technology, the system processed images in real-time to detect defects such as structural flaws, foreign objects, and contamination/residue left from the washer with higher detection accuracy and at a faster speed for line efficiency compared to conventional laser-based techniques.
- ✚ Incorporated a YOLOv5 object detection model for defect identification, a custom servo motor-driven rejection mechanism for the automated removal of defective containers, and a graphical interface for real-time monitoring, interaction, control, as well as data logging.

Public Transport Optimization System (Python + node.js + react.js) – Feb 2022 to June 2022

- ✚ Designed a smart public transportation system to enhance urban mobility by integrating real-time bus tracking, schedule optimization, and fleet management. The system allowed users to track buses, access up-to-date schedules, and view terminus details via a mobile web app, providing a seamless user experience.
 - ✚ Transit contractors could register fleets, manage dispatches, update schedules, and track finances through a centralized platform. Additionally, the system integrated a machine learning engine that dynamically adjusted dispatches and schedules based on real-time demand, optimizing routes and improving overall system efficiency.
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REFERENCES

ENG. W.T SEKESO

Electrical Power Systems Engineering Lecturer, University of Zimbabwe

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FOREMAN V. KATONHA

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ENG. RASHAYI

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