# FANNY FUSHAYI

Candidate ECSA Engineer — BEng Electrical Engineering
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## PROFESSIONAL SUMMARY

Electrical Engineering graduate with a strong foundation in high-voltage power systems, circuit design, and industrial energy solutions. Skilled in troubleshooting, system optimisation, and engineering data analysis. Practical experience spans circuit development, embedded control, and preliminary plant design for industrial applications. Adept at collaborating in multi-disciplinary environments and delivering technically robust solutions.

## TECHNICAL SKILLS

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| **Power Systems** | High-voltage design, load analysis, hybrid storage systems |
| **Circuit Design** | PCB design, H-bridge circuits, motor control systems |
| **Software** | MATLAB/Simulink, AutoCAD Electrical, LTspice, Proteus, Excel (advanced) |
| **Programming** | Python (pandas, scikit-learn), Embedded C, C++, STM32 |
| **Engineering Data Analysis** | Predictive maintenance, degradation modelling, statistical methods |
| **Tools** | Git, LabVIEW, Arduino, SPICE simulation |

## ENGINEERING PROJECTS

**Hybrid Energy Storage System (HESS)** *2024*
*University of Pretoria — Final Year Capstone*

- Designed and implemented a hybrid battery-supercapacitor system for electric vehicles, reducing peak battery loads by 40% through intelligent current-sharing algorithms
- Developed regenerative braking system recovering 30% of kinetic energy, with real-time monitoring using STM32 microcontroller
- Relevance to Mining: Directly applicable to heavy mining vehicles requiring robust power management and energy recovery systems
- Tools: MATLAB/Simulink, PCB design, embedded C programming

**PV-Generator-Battery Microgrid Optimization** *2024*
*Academic Project*

- Created rule-based energy management system prioritizing solar PV, reducing diesel generator runtime by 22% while maintaining 99% power availability
- Implemented cost optimization model comparing CAPEX/OPEX for different system configurations
- Relevance to Mining: Ideal solution for remote mining sites requiring reliable off-grid power
- Tools: MATLAB, Excel (advanced financial modeling)

**Engineering Data Analysis – Battery RUL Prediction & Various AI Projects** *2025*

- Developed regression models predicting battery degradation with 89% accuracy using NASA datasets.
- Participated in Zindi and Kaggle ML competitions, for NLP, Regression, Classification
- Applied feature engineering for voltage/current/capacity cycle analysis to support predictive maintenance.
- Tools: Python (scikit-learn, TensorFlow), pandas, Jupyter.

## PROFESSIONAL EXPERIENCE

**RBM Electricals** *2025*
*Engineering Consulting Intern (Part-time)*

- Assisted in troubleshooting motor contactor faults to ensure operational reliability.
- Contributed to preliminary designs for crusher plants, including electrical layout considerations and load distribution studies.
- Supported preparation of technical documentation and participated in multidisciplinary project discussions.

**University of Pretoria** *Feb 2024 - November 2024*
*Physics Tutor*

- Mentored engineering students in physics and electronics, improving test performance by 15%.
- Coordinated study sessions and assisted in robotics embedded systems coursework.

**Axiom Private Tutoring** *2025*
*STEM & Coding Tutor*

- Delivered lessons in Python programming, electronics fundamentals, and applied mathematics.
- Developed customised materials for student learning and project work.

## EDUCATION

**University of Pretoria** *2021-2024*
Bachelor of Engineering (BEng) in Electrical Engineering
Specialisation: Power Systems, Circuit Design, Control Systems

**Final Year Project**: Hybrid Energy Storage System for Electric Go-Kart

- Integrated battery-supercapacitor system with regenerative braking and safety diagnostics.
- Developed control algorithms for dynamic energy sharing and system protection.

## CERTIFICATIONS & LEADERSHIP

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|---|---|
| **Professional** | ECSA Candidate Engineer |
| **Technical** | Elements of AI (University of Helsinki) — Data Analysis (DataCamp) |
| **Competitions** | Kaggle/Zindi Participant |
| **Projects** | Developed STEM curriculum for robotics education |