Sello Phakoe

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PROFESSIONAL SUMMARY

A highly motivated student in Applied Mathematics & Computer Science with a background in Physics and Electrical Engineering. Passionate about applying software development, machine learning, and artificial intelligence to optimize photovoltaic (PV) systems and renewable energy storage systems. Seeking entry-level software development roles in solar PV technology, focusing on data analysis, system modeling, and energy optimization tools.

TECHNICAL DATA SCIENCE & ML PROJECTS

Solar Panel Performance Prediction using Artificial Neural Networks (ANN) | Python, TensorFlow/Keras, Pandas, Matplotlib | [Live Demo]
Technical ML Project

- Developed a machine learning model in Python (**TensorFlow/Keras**) to predict Maximum Power Point Tracking (MPPT) voltage and power for solar panels based on environmental factors like irradiance and temperature.
- Performed data pre-processing with **StandardScaler** and utilized historical solar dataset for training, achieving accurate predictions for PV system efficiency.
- Created 3D visualizations using **Matplotlib** to illustrate power variations with voltage and temperature, providing insights for renewable energy software optimization.

Battery Digital Twin using Physics-Informed Neural Networks (PINN) | Python, PyBaMM, PyTorch, Streamlit | [Live Demo]
Technical ML Project

- Built **LSTM-based physics-informed NN** to estimate internal battery states (**Li concentration, SEI thickness**) from surface measurements (voltage, current, temperature).
- Generated synthetic dataset with **PyBaMM DFN** (Chen2020 params), sweeping temps (−10 to +60°C) and C-rates (0.5–5C) over 400 cycles (>2.5M points).
- Deployed interactive **Streamlit app** with real-time PyBaMM simulations, Plotly heatmaps, and predictions for **BESS extrapolation**.

EXPERIENCE

Software Developer (Co-founder)
Moon Core Digital | August 2023 – March 2025 | Germiston

- Co-founded a tech start-up specializing in website development, 3D modeling, and digital marketing solutions.
- Involved in end-to-end project development, from client consultation to deployment, delivering custom digital solutions tailored to diverse industries.
- Managed a cross-functional team, fostering collaboration and ensuring high-quality deliverables within deadlines.

Web Developer
Zosi Group | August 2023 - November 2023 | Alrode

- Collaborated on the design and development of **Zosi Group's** corporate website, enhancing its functionality and user experience.
- Implemented responsive web designs using HTML, CSS, and JavaScript, ensuring seamless performance across devices.
- Conducted rigorous testing and debugging to ensure a secure, user-friendly platform.

PROFESSIONAL DEVELOPMENT & CERTIFICATIONS

PROFESSIONAL DEVELOPMENT

Solar PV GreenCard
Nepoworx | June 2025 - July 2025 | Riversands

- Qualified in August 2025 with comprehensive training in solar PV system design, installations, component functionality (panels, inverters, batteries), and SHE (Safety, Health, and Environment) standards for solar projects.

CERTIFICATIONS

- Introduction to Machine Learning | Kaggle | 2025

EDUCATION

Bachelor of Science - BSc Applied Mathematics and Computer Science (In-progress)

University of South Africa (UNISA) | Expected Graduation: 2028 | Pretoria

Relevant coursework passed:

- Differential Equations (APM2611)
- Applied Dynamical Systems (APM2614)
- Multivariable Calculus (MAT2615)
- Applied Linear Algebra (APM1513)

N3 & N4: Electrical Engineering (Light Current)

Damelin - Boksburg Campus | 2013 | Boksburg

Subjects Taken:

- Electrotechnics - Industrial Electronics
- Engineering Science - Mathematics

Bachelor of Science - BSc in Physics (Incomplete)

University of Pretoria | 2021 | Pretoria | Minor in Applied Mathematics

- Completed coursework in advanced mathematics, programming, and physics, demonstrating strong analytical and problem-solving skills.
- Achieved distinction in Mathematical Modeling (WTW152) with a 76% pass.

Relevant modules passed:

- Numerical Analysis (WTW123)
- Mathematical Modeling (WTW152)
- Imperative Programming (COS132)
- Waves, Thermodynamics & Modern Physics (PHY255)

Bachelor of Science - BSc in Physics & Mathematics

BSc in Physics & Mathematics | North West University (Potchefstroom Campus) | 2018 | Achieved distinction in Introductory Algebra & Calculus (MTHS111) with 76%.

Matric

Germiston High School | Germiston | 2012

Subjects Taken:

- English Home Language
- Afrikaans First Additional Language
- Life Orientation
- Mathematics
- Physical Sciences
- Mechanical Technology
- Information Technology

COURSEWORK

Introduction to Probability & Statistics - MIT-18.05 (In-Progress)

MIT OpenCourseWare | 2025 | Probability & Statistics

Fundamentals of Photovoltaics – MIT-2.627 (In-Progress)

MIT OpenCourseWare | 2025 | Photovoltaic System Design, Solar Cell Physics, Energy Conversion

SKILLS

Programming Languages: Python, C++, C#, R, Octave/Matlab

Data Science & ML: Pandas, NumPy, Scikit-learn, TensorFlow/Keras, Pytorch, Matplotlib, Kaggle, Jupyter Notebooks, Google Colab, Scipy

Web Development & Tools: Node.js, Django, React, Git/GitHub, HTML, CSS, JavaScript

Mathematical Expertise: Probability & Statistics, Calculus, Linear Algebra, Applied Mathematics, Differential Equations, Numerical Methods

Languages: English (fluent), Sesotho (Native), IsiZulu (Conversational), Afrikaans (Basic)

Soft Skills: Teamwork, Communication