


BAKOENA LEQELE

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Profile

Highly motivated and versatile engineering professional with a strong foundation in Civil Engineering and a Bachelor of Science degree in Mechanical and Mechatronics Engineering. Equipped with a unique interdisciplinary skill set, combining expertise in both civil and mechanical engineering, along with a passion for mechatronics systems and automation. Demonstrated ability to apply technical knowledge to solve engineering problems and drive innovative solutions. Proven track record of successful project completion, both in academic and professional settings. Possesses excellent analytical, communication and teamwork skills, with a focus on delivering high-quality results. Seeking opportunities to leverage my diverse engineering background and contribute to the development of cutting-edge mechanical and mechatronics solutions in a dynamic and challenging environment.

Education

- Bachelor of Science (BSc) in Mechanical and Mechatronics Engineering
University of Cape Town, Cape Town, South Africa
Dates: 2019 - 2022
 - National Diploma in Civil Engineering
Lerotholi Polytechnic, Maseru, Lesotho
Dates: 2015 - 2018
 - Lesotho General Certificate of Secondary Education
Abia High School, Maseru, Lesotho
Dates: 2010 - 2014
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Skills

- **SolidWorks:** Proficient in using SolidWorks, a 3D computer-aided design (CAD) software, for modeling, simulation, and visualization of mechanical and mechatronic systems. Able to create detailed designs, assemblies, and engineering drawings with a focus on accuracy and precision.
 - **C:** Skilled in programming using the C programming language. Familiar with coding principles, syntax, and data structures in C. Able to develop efficient algorithms and write clean, maintainable code for various applications.
 - **Python:** Proficient in Python programming language. Experienced in utilizing Python for data analysis, scientific computing, and automation tasks. Knowledgeable in libraries such as NumPy, Pandas, and Matplotlib for data manipulation, analysis, and visualization. Capable of developing Python applications with an emphasis on readability, modularity, and efficiency.
 - **Fusion 360:** Proficient in using Fusion 360, a 3D CAD/CAM software developed by Autodesk. Skilled in creating 3D models, assemblies, and technical drawings using Fusion 360's parametric modeling capabilities. Capable of simulating mechanical systems, performing finite element analysis (FEA), and generating toolpaths for CNC machining.
 - **Embedded Systems:** Knowledgeable in designing and developing embedded systems. Experienced in programming microcontrollers and using development tools such as Arduino and Raspberry Pi. Familiar with programming languages such as C/C++ for embedded systems. Skilled in integrating hardware and software components to create functional and efficient embedded systems.
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Work Experience

Nuvetech (Ltd) Pty - Hardware Engineer

Cape Town, South Africa

Dates: November 2023 - Present

- Joined Nuvetech (Ltd) Pty, a technology company specializing in electronic solutions.
- Responsible for quality checking printed circuit boards, ensuring adherence to established quality standards and specifications.
- Programming of PCB(Printed Circuit Boards) in C, C++ and python.
- Research and development of electrical systems while keeping up to date with the latest technologies.
- Design of RF antennas for PCB using various networks as GSM, GPRS, GPS etc.
- Engaged in working on the LoRa and LoRaWAN IoT (Internet of Things) project, contributing to the development and implementation of wireless communication solutions.
- Collaborated with the team to troubleshoot and resolve issues related to the LoRa and LoRaWAN IoT project, demonstrating problem-solving skills and attention to detail.
- Participated in testing and validation activities to ensure the reliability and functionality of the implemented solutions.
- Gained practical experience in working with emerging technologies and contributing to the advancement of IoT applications.
- Demonstrated the ability to work effectively in a team-oriented and fast-paced environment, meeting project deadlines and delivering high-quality results.

Nuvetech (Ltd) Pty

Cape Town, South Africa

Dates: July 2022 - June 2022

- Joined Nuvetech (Ltd) Pty, a technology company specializing in electronic solutions.
- Responsible for quality checking printed circuit boards, ensuring adherence to established quality standards and specifications.
- Engaged in working on the LoRa and LoRaWAN IoT (Internet of Things) project, contributing to the development and implementation of wireless communication solutions.
- Collaborated with the team to troubleshoot and resolve issues related to the LoRa and LoRaWAN IoT project, demonstrating problem-solving skills and attention to detail.
- Participated in testing and validation activities to ensure the reliability and functionality of the implemented solutions.
- Gained practical experience in working with emerging technologies and contributing to the advancement of IoT applications.
- Demonstrated the ability to work effectively in a team-oriented and fast-paced environment, meeting project deadlines and delivering high-quality results.

Lesotho Electricity Company

Maseru, Lesotho

Dates: January 2022 - February 2022

- Joined the Lesotho Electricity Company as part of a temporary assignment.
- Responsible for transformer maintenance tasks, including changing transformer oil and inspecting tap changers and supporting parts (e.g., upper gear and lower gear), as well as changing grease in the gears.
- Gained hands-on experience in various mechanical engineering workshop processes, such as using a lathe, grinding, milling machine, drilling machine, welding (Arc welding and TIG welding), soldering, and fitting.
- Collaborated with the team to design and construct a simple press machine, showcasing innovation and practical problem-solving skills.
- Demonstrated the ability to work effectively in a dynamic environment, ensuring the efficient operation and maintenance of electrical equipment.
- Successfully completed assigned tasks while adhering to safety guidelines and quality standards.

Civil Engineering Technician

Civil Engineering Lab, Maseru, Lesotho

Dates: 2017

- Worked as a Civil Engineering Technician at a prominent Civil Engineering Lab.
- Gained practical experience in performing various laboratory tests and experiments related to civil engineering materials.
- Assisted in conducting field tests and inspections to evaluate the quality and performance of construction materials.
- Collaborated with engineers and technicians to ensure compliance with project specifications and industry standards.
- Contributed to concrete mix design and performed testing of concrete cubes for compressive strength evaluation.
- Acquired knowledge of safety protocols and best practices in a laboratory setting, ensuring a safe and productive work environment.
- Demonstrated attention to detail, accuracy, and adherence to quality control procedures throughout assigned tasks.

Projects

1. Confidential Vehicle Tracking and Security System (Work):
 - Developed a comprehensive vehicle tracking and security system as part of a team project, incorporating advanced biometric authentication and access control measures.
 - Implemented cutting-edge technologies to ensure driver verification and access management without disclosing proprietary details.
 - Designed and integrated features for real-time monitoring of vehicle location, driver behavior analysis and geofencing capabilities.
 - Conducted extensive testing and validation to ensure system robustness and accuracy in diverse operational scenarios.
 - Presented the project's objectives, methodology and general outcomes to the client while respecting confidentiality agreements.

2. Confidential Wildlife Tracking project (Work)
 - Played a key role in the development and construction of a specialized device for sensing Koalas in their natural habitat while adhering to non-disclosure agreements.
 - Collaborated with a multidisciplinary team to design and build the Koala detection device, incorporating advanced sensing technologies and data collection capabilities.
 - Conducted rigorous testing and optimization to ensure the device's reliability and accuracy in identifying Koalas presence.
 - Collaborated with team members responsible for algorithm development and data analysis to enhance the effectiveness of the overall tracking system.
 - Contributed to project documentation and presentations, while maintaining confidentiality of sensitive information.

3. Electrical Transformer Servicing and Training (Internship):
 - Completed an internship at a reputable organization servicing electrical transformers.
 - Gained hands-on experience in various aspects of transformer maintenance, including welding, annealing and soldering techniques.
 - Assisted in the inspection, repair and maintenance of electrical transformers, ensuring optimal performance.
 - Learned industry-standard practices for ensuring transformer safety and reliability
 - Acquired valuable knowledge in electrical systems and transformer operation during the internship period.

4. Civil Engineering Laboratory Testing and Concrete Mix Design (Internship):
 - Undertook an internship where I served as a lab technician, utilizing my civil engineering diploma.
 - Conducted a wide range of tests both in the field and in the laboratory environment.
 - Specialized in concrete mix design, preparing optimized concrete compositions for specific construction projects.
 - Performed tests and concrete cubes to determine their compressive strength, ensuring compliance with industry standards.
 - Collaborated with the engineering team to analyze test results and provide recommendations for construction quality improvement.
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Certifications and Training

- Electronics Foundations: Semiconductor Devices
Issued by LinkedIn in March 2023
This certification demonstrates knowledge and skills in semiconductor devices and their applications in electronic systems. Topics covered include semiconductor materials, diodes, transistors, and basic circuit analysis. Developed proficiency in soldering and working with semiconductors.
- Arduino: Prototyping
Issued by LinkedIn in June 2022
This certification showcases proficiency in using Arduino for prototyping and developing electronic projects. Acquired knowledge of Arduino programming, interfacing sensors and actuators, and building interactive systems. Demonstrated ability to design and implement creative and functional projects using Arduino.
- Learning Arduino: Interfacing with Analog Devices
Issued by LinkedIn in June 2022
This certification validates expertise in interfacing analog devices with Arduino. Explored techniques for integrating analog sensors, amplifiers, and other components into Arduino-based projects. Gained understanding of analog-to-digital conversion, signal conditioning, and analog signal processing.

- Learning Arduino: Interfacing with Hardware

Issued by LinkedIn in June 2022

This certification demonstrates proficiency in interfacing various hardware components with Arduino. Explored techniques for connecting and controlling peripherals such as displays, motors, and communication modules. Acquired knowledge of hardware interfacing protocols and practical implementation techniques.

- MATLAB Onramp

Issued by MathWorks in August 2021

This certification signifies completion of the MATLAB Onramp course offered by MathWorks. Developed foundational knowledge and skills in MATLAB programming, data analysis, and visualization. Acquired proficiency in solving engineering and scientific problems using MATLAB.

- MATLAB Simulink Onramp

Issued by MathWorks in August 2021

This certification recognizes completion of the MATLAB Simulink Onramp course provided by MathWorks. Developed proficiency in using Simulink, a graphical programming environment for modeling, simulating, and analyzing dynamic systems. Acquired knowledge of block diagram modeling, simulation, and deployment of models using Simulink.

- Introduction to Programming Using Python

Issued by DataCamp in June 2021

This certification validates completion of the Introduction to Programming Using Python course on DataCamp. Acquired foundational knowledge of Python programming, including variables, data types, control structures, functions, and file operations. Developed proficiency in writing Python programs to solve basic programming problems.

Awards and Honors

Awards and Honors

- Dean's List, University of Cape Town (2019):
 - Recognized for academic excellence and outstanding performance, earning a position on the Dean's List at the University of Cape Town in 2019.
 - Demonstrated exceptional commitment to learning, achieving consistently high grades throughout the academic year.
 - Recognized as one of the top performing students in the Mechanical and Mechatronics Engineering program.
 - Highlighted dedication to academic pursuits, strong work ethic, and ability to excel in a challenging educational environment.
 - Abia High School Top Achiever (2014)
 - Acknowledged as one of the top achievers during high school, demonstrating consistent academic excellence and exceptional performance.
 - Received recognition for outstanding achievements in academics, reflecting a strong commitment to learning and intellectual growth.
 - Consistently demonstrated a high level of dedication, discipline and drive to succeed in all areas of study.
 - Highlighted ability to excel in a competitive educational environment and showcased a strong foundation for future academic endeavors.
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Professional Affiliations

- Member, Water Institute of South Africa (WISA):
 - Actively engaged as a member of the Water Institute of South Africa (WISA), a leading professional organization in the field of water resources management and research.
 - Participate in networking events, conferences, and workshops organized by WISA to stay updated on the latest developments and trends in the water industry.
 - Benefit from the opportunity to connect and collaborate with fellow professionals, researchers, and experts in the field of water resources.
 - Stay informed about advancements in water-related technologies, policies, and sustainable practices through the resources and publications provided by WISA.
 - Contribute to the knowledge exchange and development of best practices within the water sector through active involvement in WISA initiatives and working groups.
- Member, Lesotho Student Organization (University of Cape Town):
 - Engaged as a member of the Lesotho Student Organization, a student-led platform that supports and connects students from Lesotho studying at the University of Cape Town.
 - Actively contributed to the organization's mission of providing mentorship and creating a supportive community for Lesotho students.
 - Participated in organizing activities and events aimed at promoting social, cultural, and recreational opportunities to help students balance their academic pursuits.
 - Facilitated mentorship programs and peer support networks to assist fellow students in navigating university life and achieving their academic goals.
 - Played an active role in fostering a sense of belonging and cultural exchange among Lesotho students and the broader university community.

- Tutor, Project Tshehetso (University of Cape Town):
 - Volunteered as a tutor in Project Tshehetso, a University of Cape Town program designed to provide academic support to first-year engineering students.
 - Assisted students in understanding complex engineering concepts and developing effective study strategies.
 - Conducted tutoring sessions, group discussions, and workshops to enhance students' understanding of course material and improve their academic performance.
 - Mentored and guided first-year students in navigating the challenges of engineering studies and adapting to university life.
 - Contributed to the success and retention of first-year students through personalized academic support and fostering a supportive learning environment.
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Additional Activities

- School of Design Thinking, University of Cape Town:
 - Engaged in the School of Design Thinking, a platform at the University of Cape Town that fosters innovation, creativity, and problem-solving skills.
 - Participated in various workshops, seminars, and design thinking sessions to develop a multidisciplinary approach to problem-solving.
 - Contributed to collaborative projects and ideation sessions, fostering creativity and teamwork in developing innovative solutions.
 - Selected to represent the School of Design Thinking in a YouTube interview, where I shared insights and experiences regarding design thinking principles and its application in real-world scenarios. Refer to:
<https://www.youtube.com/watch?v=kBY5oPxhJpM&t=24s>
 - Demonstrated effective communication skills and the ability to articulate complex concepts in an accessible manner during the interview.
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IT and Computer proficiency

- MATLAB – MATLAB Onramp and MATLAB Simulink Onramp training Certificates
 - Python – In possession of DataCamp Introduction to programming certificate
 - Solidworks
 - LTSpice
 - Proficient in the use of MS Office
 - AutoCAD
 - Visual Basic for Applications (VBA)
 - AT Commands
 - Ces Edupack
 - AT Commands
- LabVIEW
 - Embedded Systems (STM32F)
 - MS Excel
 - C programming
 - IoT, Internet of Things
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Communication

- Languages – English and Sesotho
 - Public speaking skills developed through class presentations
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Referees

1. Lesotho Electricity Company
Moshoeshoe Road, Industrial Area,
Maseru 100, Lesotho
Phone: (+266) 5210 0000
2. University of Cape Town
Department of Mechanical Engineering
Moshoeshoe Rd, Rondebosch,
Cape Town, 7700, South Africa
Phone: 021 650 323

3. Nuvetech

Table View

Cape Town, South Africa

Email: admin@nuvetech.org

Phone: +27 (0)79 079 5312

4. Civil Engineering Laboratory

Ha-Tsolo

Maseru, Lesotho

Email: tsoeujm@hotmail.com

Phone: +266 58855899