Kananelo Chabeli

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Professional Summary

Dedicated and results-driven Electrical and Computer Engineering graduate with a strong foundation in designing and optimizing communication systems. Expertise includes developing scalable software solutions, enhancing system security, and advancing next-generation networks (5G and 6G). Demonstrated experience in leading technical projects, including radio resource allocation and radar signal processing, with a focus on reliability, efficiency and innovation. Passionate about leveraging advanced technologies, such as machine learning and IoT, to drive the development of sustainable and secure communication ecosystems.

Education

University of Cape Town, Cape Town, South Africa *Mar 2021 – Dec 2024*
Bsc(Eng) Electrical and Computer Engineering

- Dean's Merit Awards: 2021, 2022, 2023.
- Cumulative GPA: 76.23%.

National University of Lesotho, Maseru, Lesotho *Jul 2019 – Sep 2020*
Bsc General First Year

- Cumulative GPA: 4.6/5.0.
- Graduated with good academic standing.

Work Experience

University of Cape Town, Cape Town, South Africa *Nov 2024 – Dec 2024*
Research Assistant

- Assisted in developing vehicle speed measuring radar systems operating in an 24GHz band.
- Gained hands-on experience in radar signal processing, radio frequency bands, and firmware development.
- Developed strong technical writing and verbal communication skills.

University of Cape Town, Cape Town, South Africa *Feb 2023 – Oct 2024*
Academic Tutor

- Delivered focused tutorials on Mathematics, Embedded Systems and Electronics subjects.
- Provided actionable feedback on coding assignments, ensuring adherence to industry standards and fostering skill development.
- Collaborated with senior tutors and course conveners to improve student performance.

Electro Refrigeration PTY LTD, Maseru, Lesotho *Nov 2022 – Jan 2023*
Engineering Intern

- Designed and tested electrical circuits for air conditioning and refrigeration systems, optimizing energy efficiency.
- Collaborated with multidisciplinary teams to resolve electrical failures, refining troubleshooting capabilities.

University of Cape Town, Cape Town, South Africa *Jun 2022 – Aug 2022*
Vacation Work Student

- Engineered helicopter control systems, ensuring optimal functionality and reliability.
- Diagnosed and resolved power system issues using suitable diagnostic tools.
- Developed proficiency with oscilloscopes, multi-meters, and logic analyzers.

Projects

Vehicle Speed Measuring Radar Systems *Nov 2024 - Dec 2024*

- Deployed continuous-wave radar systems to measure vehicle speed using concept of Doppler Frequency.
- Designed and conducted detailed field experiments to validate and improve the radar systems.
- Cultivated strong understanding of radar signal processing techniques,and tools such at Doppler processing and Short-Time Fourier Transform (STFT).

Predictive Admission Control for 6G *Jul 2024 - Oct 2024*

- Developed a machine learning algorithm to improve resource allocation for integrated terrestrial and non-terrestrial networks(6G).
- Gained experience in network modeling and simulation tools such as mini-net, NS-3, Cisco packet Tracer, and Wireshark.
- Reduce horizontal satellite hand-off rate by 80% and call blocking probability by 40%.

Radio Network Selection in Heterogeneous Networks *May 2024 - Jun 2024*

- Designed a RAT selection algorithm in heterogeneous wireless network environment using Technique for Order Preference by Similarity to Ideal Solution (TOPSIS) method.
- Developed strong problem-solving mindset in a supervised environment.
- Gained experience in design Joint Radio Resource Management(JRRM) algorithms.

FPGA Implementation of a Median Filter *Mar 2024 – Apr 2024*

- Designed a real-time digital accelerator for median filtering on a Nexys FPGA platform.
- Optimized system performance, achieving minimal error rates during data processing.
- Gained experience in high-performance embedded system design, and optimization.

Design of IoT Weight Scale for Ornithology Research *Feb 2024 – Jun 2024*

- Created a tailored IoT weight scale to measure Fork-tailed Drongos mass in the Kalahari Desert.
- Developed a tailored IoT solution for Ornithology field researchers, enhancing Africa's environmental conservation effort.
- Achieved 95% user satisfaction by collaborating closely with end-users and refining user requirements.

Skills

- **Programming:** Proficient in Object Oriented Java, Python Scripting, and Embedded C/C++.
- **Development Methodologies:** Experienced wit Agile and Scrum development methodologies.
- **Development Tools:** Familiar with modern integrated development environments like Visual Studio, and source control management tools such as Git.
- **Problem-Solving:** Excellent problem solver, with strong systems security mind-set.
- **Networking:** Strong understanding of networking technologies, and resource management algorithms design for next generation networks(5G or 6G).
- **Cybersecurity:** Aspiring systems vulnerability and security researcher.
- **Communication:** Effective writing and verbal communication abilities for team collaboration and client interaction.
- **Willingness to Learn:** Open-minded learner with curiosity to acquire knowledge in new technologies and development frameworks.

Certificates and Awards

- **Cisco:** Ethical Hacking (in progress)
- **Udemy:** Introduction to Network Security (in progress)
- **Cisco:** Introduction to Cybersecurity (Obtained Jan 2024)
- **Government of Lesotho:** Top 10 Achiever Award (Obtained 2018)

Interests and Hobbies

- Intrusion Detection and Prevention Systems
- Ethical Hacking and Systems Vulnerability Assessment.
- Software Development.
- Machine Learning and Wireless Network Design.

References

Available upon request.