Ryan Selesnik

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General Information

Citizenship: South Africa

Fluent languages: English

Skills include: A strong programming background in C/C++ and Python; Extensive experience simulating control, stochastic, and communication systems using LTspice, MATLAB, and Simulink; Data analysis and visualisation using the scientific Python stack (NumPy, Matplotlib, Pandas); Machine Learning with PyTorch, HuggingFace and scikit-learn; Proficient in Bash/Zsh and the Unix core utilities; Working with Linux, macOS, and Windows; Git and GitHub; LaTeX; Prototyping and testing with an oscilloscope; Full-stack web development; Automating developer environments with Vim and shell scripts; Experience with multi-threading and concurrent programming.

Education

The University of the Witwatersrand — *Johannesburg, South Africa*
BSc (Eng) Electrical & Infromation Engineering (with Distinction) — *2019 to 2021*

King David High School, Linksfield — *Johannesburg, South Africa*
National Senior Certificate (Independent Examination Board) — *2014 to 2018*

Experience

Stream – A Division of VAT IT — *Johannesburg, South Africa*
Software Engineering Intern — *Nov 2020 to Jan 2021*

- Developed a versatile PDF generation system using Ruby, JSON, and Microsoft's Mail Merge.
- Enabled non-technical employees to generate customer–specific PDFs, without relying on the software development team, thereby minimising Stream's opportunity costs.

Stream – A Division of VAT IT — *Johannesburg, South Africa*
Software Engineering Intern — *Dec 2021 to Jan 2022*

- Wrote a Ruby script to parse PDFs to structured data. This eliminated the tedious task of looking up duty and tax information for imported products.
- Developed a customisable message dashboard system using a headless Content Management System, Vue, Node.js, HTML, and CSS, enabling non-technical employees to edit Stream's website directly.
- Wrote two sets of comprehensive documentation for the dashboard system. One for the developers and another for the non-technical employees.

Projects

Final Year Investigation Project — *Machine Learning*

- Conducted an investigation into a low–cost AI toy that can assist in Early Childhood Development.
- Implemented speech recognition and natural language understanding capabilities using modern ML models such as OpenAI's Whisper and Transformers.
- Ported the speech recognition model to a Raspberry Pi and used a children's speech dataset to assess the performance of offline children's speech recognition.

Final Year Design Project — *Machine Learning*

- Designed a therapeutic chatbot using GPT-2 and Reinforcement Learning.
- Adapted the input context of GPT-2 and used an empathetic reward function as part of the training objective.

Switch-mode Power Supply — *Power/Control Systems, Electronics*

- Simulated and built a switch-mode power supply based on the buck converter topology, achieving an output ripple of less than 1%.
- Implemented negative feedback by modulating the duty cycle to ensure a constant output of 5V, independent of the load.

Sensor Measurement Analysis using MPI — *Big Data*

- Wrote a script to compute statistical indicators for a given data set generated by a sensor in an Inertial Measurement Unit (IMU).

- Achieved a speedup of approximately 4x by leveraging Python bindings for the Message Passing Interface (MPI) as well as a computer cluster to parallelize the computation.

Temperature Sensor *Embedded Systems*

- Designed and built a temperature sensor using the ATmega328P and programmed the logic in Assembly.

Multi-player Worlde *Full-stack Web Development*

- Collaborated with a team of 5 to develop MultiWordle, a multiplayer version of Wordle. The tech–stack included JavaScript, Express, HTML, CSS, GitHub Actions, and MongoDB.

Centipede++ *Software Development*

- Collaborated with a team of 2 to develop the Centipede computer game in C++.

Honours and Awards

Isazi Prize *University of the Witwatersrand*

Awarded to the top 5 information engineering students who achieved an aggregate of 70% and above in their third year of study.

The Dean's List *University of the Witwatersrand*

The Dean's list recognises the top 10% of students provided that a minimum average/aggregate of at least 70% is obtained on a full curriculum.

Wits Mathematics Competition *University of the Witwatersrand*

Selected to represent King David High School, Linksfield at the Wits mathematics competition in 2018.