

# RYAN SELESNIK

Johannesburg, South Africa

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## GENERAL INFORMATION

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**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; L<sup>A</sup>T<sub>E</sub>X; 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

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**The University of the Witwatersrand**

BSc (Eng) Electrical & Information Engineering (with Distinction)

Johannesburg, South Africa

2019 to 2021

**King David High School, Linksfield**

National Senior Certificate (Independent Examination Board)

Johannesburg, South Africa

2014 to 2018

## EXPERIENCE

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**Stream – A Division of VAT IT**

Software Engineering Intern

Johannesburg, South Africa

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**

Software Engineering Intern

Johannesburg, South Africa

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

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**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) 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**

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#### **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.