



Software Developer



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PERSONAL STATEMENT

My goal is to leave the world a better place than I found it. I plan to bring that goal into reality by creating technology that improves the quality of life. These goals have motivated my passion for software engineering and the open-source community as a tool for sharing knowledge. This objective has led me to an internship at NIWA, collaborating with scientists and physicists to publish their research on our oceans and atmosphere to a global audience. Software is a medium to explore my scientific curiosity and contribute a meaningful change.

EXPERIENCE

Research Assistant - 2021 to Present - *Victoria University of Wellington*, Wellington, NZ

- Awarded a Summer Research Scholarship by the Engineering faculty.
- Generate a database of sound fields in rooms using the Image-source method.
- Use PyTorch to develop Conditional Neural Processes to interpolate sound fields.
- Write a research paper to summarize experiments and their analysis.

300 Level Tutoring - 2021 - *Victoria University of Wellington*, Wellington, NZ

- Following the state of the art Human-Computer Interaction literature and Mobile Application Development frameworks covered in the course.
- Deliver tutorials to third-year students on how to develop mobile applications using modern JavaScript frameworks (i.e Ionic and React Native).
- Marking and providing meaningful feedback on technical writing and implementations for mobile applications.

Web and Content Intern - 2021 - *Wellington Chamber of Commerce*, Wellington, NZ

- A strong focus on business and legislation helped develop the toolkit and familiarity with the knowledge and skills required to run a successful business.
- Data visualization to deliver engaging and interactive tools to explore business and marketing analysis data in a digitized form.
- Web development using the iMIS Engagement Management System. Maintaining and developing new components that are dynamically generated from a database.
- Collaboration with marketing and design teams using an agile methodology to deliver effective products that meet user requirements.

Software Intern - 2020 to Present - *NIWA*, Wellington, NZ

- Multi-disciplinary collaboration to implement an end to end best practice OGC Standard software.
- Open-source technology stack to create web services that queried a database on a Linux cloud server.
- Participate in weekly meetings to communicate progress. Documentation of work to non-technical users through best practise agile methodology.
- Work remotely from home due to the COVID-19 pandemic. Utilizing industry-standard tools (i.e, Microsoft Teams for communication and Pulse Secure for SSH).

Front of House - 2018 to 2019 - *St. Johns Bar and Eatery*, Wellington, NZ

- Organise a team to work efficiently.
- Deliver value to a customer and to be honest regarding roadblocks.

Back of House / Front of House - 2012 to 2018 - *Mac's Brewery*, Wellington, NZ

- Cope under pressure in a fast-paced work environment that involved risk management, i.e. negotiations with disorderly customers.
- Empathetic and Active Listening when dealing with confrontations.

EDUCATION

Bachelor of Engineering (Software Engineering) - 2016 to Present - *Victoria University of Wellington*

- Subjects were chosen to provide an academic background to supplement a full-stack developer. **Industry Research Project, Human-Computer Interaction, Deep Neural Networks, Compiler Engineering**
- **Class representative** - SWEN430 Compiler Engineering, liaison between students and faculty for course-related problems.
- **Note-Taker** - Volunteer position communicating information to make the university accessible to a wider audience.
- **Victoria Excellence Scholarship** - Awarded to those who excelled in their secondary school studies.

N.B The Head of School's commentary on my grades is attached to this document.

NCEA Level 3 - 2011 to 2015 - *Rongotai College*

- These subjects provided the bedrock for a passion in Computer Science. **Computers, Physics, Calculus, English, Graphics, Music**
- Extra-curricular roles helped develop hone in public speaking and presentation skills. **Prefect, UN Youth Ambassador, Jazz Band, Production Band, Debating**
- **Scholarship English** - This is an award for university level written communications skills given to secondary school students.

PROJECTS

Fish Oil Analysis

A machine learning project with industry partner New Zealand Plant & Food. Performed classification and feature selection on Gas Chromatography data from fish oil data. Found the Support Vector Machine model could classify fish species from tissues samples with near-perfect accuracy (98.3%). This research has a high impact on food science, and can likely be used to automate a laborious manual process in a factory setting.

Data Ingestion

Ingesting multiple datasets into the NZODN portal. This is an open-source technology stack that implements OGC standards. It uses tools such as GeoServer to provide web services to display maps, and GeoNetwork as a CMS for a metadata catalogue. We configure the software to use a Postgres database storing geospatial data.

Resource Portal

The iMIS EMS is an Engagement Management System the Wellington Chamber of Commerce uses to manage the content on its website. I developed an automated workflow to digitize paper-based documents and to create a digital version of the documents. These documents were converted into responsive and engaging web pages.

Advent of Code

An advent calendar of programming puzzles that are language agnostic. The functional programming language Haskell was chosen. In Haskell, programs cannot store state so functions cannot have unintended side effects. Reducing the likelihood of errors meant solving problems faster. Incorrect submissions were penalized, so test cases were verified before submitting a final answer.

TECHNICAL TOOLS

Scripting: General knowledge of the fundamental principles and tradeoffs for a breadth and depth of programming languages. Consisting of both the Functional and Object Oriented paradigms, and a mix of High and Low-level languages. **JavaScript, HTML5, CSS, React, Angular, Vue, Python, Haskell, Ruby, Java, C, Unreal Engine, C++**

Machine Learning: Practical experience implementing machine learning pipelines to produce business knowledge from real-world datasets. Use of scripting languages for preprocessing, exploratory data analysis, training and testing, and data visualization. **Python, PyTorch, TensorFlow, Scikit-learn, Keras, R, Weka**

Databases: Academic and practical knowledge in both SQL and NoSQL database systems. Created databases using cloud services that are utilized in full-stack applications. **Firebase, Postgres, Postgis, iMIS, SQLite, MongoDB**

Workflow: Git is an amazing tool for version control and agile documentation of development. It provides an excellent environment for a development community, working together asynchronously and remotely. **Git, Gitlab, Github, Git-Bucket, Jira, LaTeX, Markdown, PlantUML**

WORKSHOPS AND CONFERENCES

MAXAR Hackathon 2021

This was a 24 hour GIS + AI hackathon. Our team worked towards creating a sea level rising visualisation web application. Also, we developed a supervised object detection algorithm to identify houses from satellite imagery along coastlines. Maxar is a space technology company that design and manufacture satellites and spacecraft components for communication.

WOSSAT

The Wellington Open Source Show and Tell (WOSSAT) is a monthly meetup hosted by Catalyst. This meetup demonstrates notable new technologies, hobby projects and open source advocacy. The open-source community promotes open standards and open data that reduce the barriers to access to technology.

FOSS4G SoTM

Due to the virus, local hubs for the international event were held. This conference covers cutting edge open-source GIS software. A former developer at MapBox found out their software was being used for drone strikes in the middle east. An important takeaway from the conference was the ethics of the software we develop.

Python Data Ingestion

The attendees were mostly data scientists and software developers. This covered using Python for Scientific Computing. We explored the Anaconda environment for Python development for package management. It can be used to replicate a python environment on another machine. A Jupyter notebook is an important tool for Literate Programming as it merges documentation and codebases.

Databases 101

There was an interesting discussion that compared RDBMS vs NoSQL databases. There is are certain tradeoffs between different software quality attributes, and risks involve getting vendor-locked into proprietary cloud software (i.e., AWS, Azure or Firebase). As a developer who creates and maintains these databases, it was useful to understand the goals of the end-users of the product.

HOBBIES

Debating

Public speaking, politics, philosophy, UN Youth Ambassador

Sciences

CS, AI, Robotics, Astrophysics, Psychology

Guitar

Classical, Jazz, Blues, Classic Rock

Sports

Canoe Polo, Table Tennis

REFERENCES

Andrea Mari - Research Software Engineer at *Niwa*

Andrea is my mentor at Niwa. He has introduced me to the software development processes at Niwa, including Jira and regular agile meetings. I am humbled to learn from his industry expertise as a software developer.

Tom Moorhead - Functions Coordinator at *Mac's Function Center*

We planned large scale events for several hundred people. We employed industry standards in catering and collaborated with the host to meet their vision for the event.

Miniruwani Samrakoon - Co-President, Postgraduate, Students Association at *Victoria University*

Miniruwani was my tutor for my 300 level Engineering group project. This involved collaboration using agile methodologies to develop a web application. That application provided a Mission Control interface for a Rocket.

N.B Contact information is available upon request.



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SCHOOL OF ENGINEERING AND COMPUTER SCIENCE

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26 November 2021

Jesse Wood

7 Humber St Island Bay

Wellington 6011

Tēhā Koe Jesse

On behalf of the School of Engineering and Computer Science, I would like to offer you a warm congratulations on achieving the grades SWEN422: A+ and SWEN430: A-

It gives the school great pride when students achieve academic success at this level. I am sure it has entailed a good deal of hard work on your part and is well deserved.

My colleagues and I will be happy to give advice on opportunities at both undergraduate and postgraduate levels and we look forward to supporting your future academic success.

We hope that you have a relaxing break over the summer holidays.

Ngā mihi

Dr Craig Watterson
Head of School



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13 November 2020

Jesse Wood

7 Humber St, Island Bay

Wellington 6011

Tēhā Koe Jesse

On behalf of the School of Engineering and Computer Science, I would like to offer you a warm congratulations on achieving the grades COMP309: A, ENGR302: A and SWEN325: A

It gives the school great pride when students achieve academic success at this level. I am sure it has entailed a good deal of hard work on your part and is well deserved.

My colleagues and I will be happy to give advice on opportunities at both undergraduate and postgraduate levels and we look forward to supporting your future academic success.

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Ngā mihi

Dr. Stuart Marshal
Head of School