JESSE
WOOD

Software Engineer

Wellington, New Zealand
+64 210 26 48190
j.r.h.wood98@gmail.com
woodrock.github.io
github.com/woodrock
linkedin.com/in/jrhwood

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

PhD student - 2022 to Present - *Victoria University of Wellington* , Wellington, NZ

- Awarded a Wellington Doctoral Scholarship by the Engineering faculty.
- Marine biomass analysis of mass spectrometry data with deep learning, evolutionary computation, and machine learning.
- Using sklearn, pytorch, and DEAP to construct machine learning tools.
- Applications in chemistry with Rapid Evaporative Ionization Mass Spectrometry.
- Detect fish species, body parts, oil and cross-species contamination.
- Publish a research paper at AJCAI 2022 detailing my work.

Research Assistant - 2021 to 2022 - *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.

Tutoring - 2021 Present - *Victoria University of Wellington* , Wellington, NZ

- COMP309 - Machine Learning (2023)
- SWEN304 - Databases and system engineering (2023)
- ENG301 - Engineering Project Management (2022)
- ENGR401 - Professional Practice (2022)
- ENGR302 - Engineering Project Management (2023)
- SWEN325 - Software Development for Mobile Platforms (2022)
- SWEN325 - Software Development for Mobile Platforms (2021)

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 2024 - *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 practice 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 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) - 2022 to Present - *Victoria University of Wellington*

- **Wellington Doctoral Scholarship** - Awarded to those who excelled in their undergraduate studies.

Bachelor of Engineering (Software Engineering) - 2016 to 2022 - *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 and hone 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 that could classify fish species from tissue 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, GitBucket, Jira, LaTeX, Markdown, PlantUML**

WORKSHOPS AND CONFERENCES

New Zealand Seafood Conference 2024
A two-day conference on the New Zealand seafood industry featuring talks from experts in the field. This conference provided a comprehensive overview of the seafood industry and provided unique perspectives from those who work in it.
Auckland, New Zealand - Attended in person
7-8 August 2024

GECOO 2022
The Genetic and Evolutionary Computation Conference (GECCO) presents the latest high-quality results in genetic and evolutionary computation since 1999. This conference was an invaluable opportunity to learn about state-of-the-art evolutionary computation.
Boston, USA - Attended Virtually
July 9-13, 2022

EvoStar 2022
The Leading European Event on BioInspired Computation. This conference provided an excellent opportunity to learn about evolutionary computation research and its applications.
Madrid, Spain - Attended Virtually
20-22 April 2022

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 designs and manufactures 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 are certain tradeoffs between different software quality attributes and risks involved in 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.

Bing Xue - PhD Supervisor, Deputy Head of School Research International School of Engineering and Computer Science *Victoria University*
Bing is one of my PhD supervisors. She supervised me on my industry project that involved marine biomass analysis using machine learning techniques on rapid evaporative ionization mass spectrometry.

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.

VICTORIA UNIVERSITY OF WELLINGTON
TE HERENGA WAKA

SCHOOL OF ENGINEERING AND COMPUTER SCIENCE
TE KURA MĀTAI PŪKAHA PŪROROHIKO
VICTORIA UNIVERSITY OF WELLINGTON, PO Box 600, Wellington 6140, New Zealand
Phone + 64-4-463 5341 • **Email** office@ecs.vuw.ac.nz • **Web** www.wgtn.ac.nz/ecs

26 November 2021

Jesse Wood
7 Humber St Island Bay
Wellington 6011

Tēnā 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

VICTORIA UNIVERSITY OF WELLINGTON
TE HERENGA WAKA

SCHOOL OF ENGINEERING AND COMPUTER SCIENCE
TE KURA MĀTAI PŪKAHA PŪROROHIKO
VICTORIA UNIVERSITY OF WELLINGTON, PO Box 600, Wellington 6140, New Zealand
Phone + 64-4-463 5341 **Fax** +64-4-463 5045 **Email** office@ecs.vuw.ac.nz **Web** www.victoria.ac.nz/ecs

13 November 2020

Jesse Wood
7 Humber St, Island Bay
Wellington 6011

Tēnā 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.

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

Ngā mihi

Dr. Stuart Marshal
Head of School