Connor Mattson

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I'm a final year student studying a BE(Hons) in Engineering Science / BSc in Computer Science at the University of Auckland. I am interested in Software Development, Data Science, Operations Research, and financial applications of mathematics/computing such as Quantitative Analysis.

Computers were introduced to me as a tool for people to use to make their lives easier. Looking into how computers do this, I began to search for other ways to simplify tasks. Eventually this led me to Engineering Science, a degree that focuses on developing mathematical models to minimise costs, maximise efficiency, and simulate outcomes to make the best possible decision.

Skills and Personal traits

Python, Julia, MALTAB, C, HTML, CSS, JavaScript
Git / Source control, Project management, Independent, Critical Thinker, Adaptive, Passionate

Education

BE(Hons) in Engineering Science / BSc in Computer Science, University of Auckland (2021)
- 8 x Certificate of Outstanding Achievement from HoD of Computer Science
- First class honours (2020)

NCEA Level 3 With Excellence, Saint Kentigern College (2016)
- Proxime Accessit to the Dux (2016)
- Saint Kentigern Scholarship (2016)
- Headmaster's Award for contribution and service to the college and community (2016)
- Top Academic's award (2015)
- First in class – Computer Science (2013, 2014, 2015 and 2016)

Young Scholars Programme, University of Auckland (2016)
Cisco Certified Network Associate (CCNA) - Routing and Switching (2015)

Work Experience

Software Engineer Intern **2018 – present**
Rocket Lab Limited, Auckland
What started as a fixed term internship at Rocket Lab quickly became a permanent role working part-time during university semesters and full-time during breaks. I work closely with both the Production and Avionics teams in developing **Python** applications as well as contributing to **embedded firmware** written in **C**. I was the lead developer on projects that have:
- Been deployed throughout the company both in New Zealand and The United States
- Significantly reduced production time and cost – in several cases I investigated inefficiencies and proposed these projects myself, leading to savings of over 90% in both metrics
- Aided in certification and qualification by NASA

Head of Engineering **2019 – present**
Koios, Auckland
Koios is a team within the Auckland Programme for Space Systems; our aim is to increase interest in STEM at university by engaging students at a high school level using New Zealand built satellites. During weekends when I was not working or studying, I am leading the design and development of a 1U CubeSat and associated ground infrastructure. I specifically worked on the following aspects:
- Systems architecture, Project management, and leadership of several engineers
- Scheduling of communications windows for optimal power and bandwidth usage
- On-board computer and payload computer firmware, **embedded systems programming**
- Orbit simulation and analysis in **MATLAB** and **Python**
- Ground station control software **Python** and **C**
- Database access through a REST API and website – **Javascript**, **HTML**, and **CSS**

Relevant Personal Projects

A partial list of projects that I've worked on can be found at connormattson.github.io/projects, or on my GitHub: github.com/connormattson. I'm happy to discuss any of my past work.

Miscellaneous Scripts and Challenge Solutions
I love solving programming challenges or puzzles and competing in programming competitions. I keep a record of solutions and I'm working on documenting these and building them into a database. The majority of these solutions are written in **Python**.

JuDAS
An open-source **Julia** package for solving stochastic dynamic programming problems. By implementing Mixed Integer Dynamic Approximation Scheme (MIDAS), JuDAS approximates Bellman functions using step functions. This allows for a non-convex cost-to-go without the need for binary expansion.

Stock-Calc
A quantitative analysis tool which takes in data about a given security and generates random forests. The forests are used for predicting whether the closing price of that security will increase or decrease the following day. Stock-Calc is built in **C** and **R**, as well as utilising some **Python**.

Shielded
A prototype end-to-end encrypted messaging app demonstrating the ease at which standard such as **OpenPGP** can be implemented. The client and server were written in **Python**. Shielded was my first exposure to encryption, designing and implementing network protocols, and user authentication. I leant a huge amount from this project and it was a pleasure to work on.

Tyred – Summer of Tech Create Camp 2018
Create Camp was a two-day hackathon in which teams were challenged to create apps that make use of a New Zealand API. Using **HTML, CSS, and JavaScript,** my team created Tyred, which finds the most energy efficient (for cyclists) route between two addresses. We were awarded prizes for the most hurdles overcome and the best collaboration.

Achievements

2017: 4th in the New Zealand Programming Contest (Tertiary Intermediate category)
2016: 10th in the New Zealand Programming Contest (School category)
2015: 4th in the New Zealand Junior Robocup (Premiere category)
2014: 2nd in the New Zealand Junior Robocup (Premiere category)
2013: 1st in the New Zealand Junior Robocup (Senior category)

I am particularly proud of my results in the following University papers:

A+	Computer Organisation	A+	Computer Science Fundamentals
A+	Programming Techniques	A+	Software Development Methodologies
A+	Modelling in Operations Research	A+	Decision Making in Engineering
A+	Algorithms for Optimisation	A+	Integer and Multi-objective Optimisation
A+	Managing a business	A	Discrete Structures in Mathematics
A	Machine Learning	A	Introduction to Engineering Computation
A	Applied Modelling in Optimisation	A	Computational Techniques
A	Engineering Science Design	A	Honours Project in Engineering Science

Club Memberships / Volunteering

2019 - 2019	Developers Society	Executive Team
2016 - 2016	Design Council	Founding Chairman
2016 - 2016	Scholars Group	Member
2014 - 2016	Python Programming Club	Student in Charge
2014 - 2015	Cisco Networking Academy	Student in Charge
2013 - 2015	Robotics Club	Student in Charge
2013 - 2015	Students in IT	Volunteer