

Anatol Coen

SOFTWARE ENGINEERING & MATHEMATICS STUDENT

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Summary

I am a second year student at the University of Auckland pursuing a conjoint degree in Software Engineering and Mathematics. I have a passion for problem-solving and understanding how complex systems work on a deep level. Alongside my academic interests, in my free time, I enjoy swimming, crocheting, and going on occasional hikes during long breaks.

Currently, I am second in New Zealand in LeetCode contest rating and first in New Zealand on CodeForces. I also have a bronze medal from the 35th International Olympiad in Informatics.

Personal Projects

More details on some of these projects can be found on [my website \(anatol.nz\)](https://anatol.nz).

SAIS (Salamander's AI Session)

AN EXTENSIBLE FRAMEWORK FOR EASILY CREATING PROGRAMMING ACTIVITIES SIMILAR TO MIT BATTLECODE

Jul. 2023 -

- Pits students' programs against each other in a game like multi-player "Snake" and streams these games back to students in real-time.
- Used as an activity at the 2024 and 2025 New Zealand Olympiad in Informatics January training camps.
- Uses a Domain Specific Language to specify the agent-server interactions a game involves and create scaffolding to streamline the implementation of new games. Snake can easily be switched out for another game.
- Sandboxes students' code to ensure security and robustness.
- **Technologies Used:** Git, Rust, C++, Python, Code Tokenisation, Recursive Descent Parsers, Code Generation, DSL, Sandboxing, SQLite3, Asynchronous Programming, HTTP/SSE

Fourier Drawer

A TOOL TO CREATE ELEGANT ANIMATIONS OF TEXT

Jan. 2025

- Animates the drawing of text using Fourier Series to create satisfying visuals, inspired by [3blue1brown's Fourier Series Videos](#).
- Derived analytical expressions for the Fourier Series of parametric lines, Bezier curves and arcs.
- Uses WebGL to efficiently render what would otherwise be thousands of line segments changing colour in real time.
- Implemented the maths in both Python and JS to allow for the text to be changed on the client side.
- **Technologies Used:** Git, Python, JavaScript, Fourier Series, Integral Calculus, HTML Canvas, WebGL, OpenType.js

Rubik's Cube Solver + EV3 Robot

A C++ APPLICATION THAT CAN QUICKLY AND EFFICIENTLY SOLVE RUBIK'S CUBES

Dec. 2022 - Feb. 2023

- Quickly finds near-optimal solutions to a Rubik's Cube using Kociemba's algorithm. Solutions typically consist of up to 22 moves.
- Simulates up to 15 million moves per second by using very large lookup tables.
- Renders and animates the Rubik's Cube in 3D using OpenGL.
- Scans physical Rubik's Cubes from a camera using OpenCV.
- Communicates over TCP/IP with a Lego EV3 robot to solve physical Rubik's Cubes.
- **Technologies Used:** C++, IDA*, Kociemba's + Korf's Algorithm, OpenGL, OpenCV, TCP/IP, Lego EV3, ImGui

Work Experience

New Zealand Olympiad in Informatics (Inc.)

New Zealand

(VOLUNTEER) EGOI TEAM MANAGER, NZIC CONTEST DIRECTOR AND CAMP STAFF

Jan. 2024 - Present

- New Zealand Olympiad in Informatics (NZOI) is a volunteer-run organisation responsible for selecting and sending a team to the International Olympiad in Informatics (IOI) and European Girls' Olympiad in Informatics (EGOI).
- Will accompany the New Zealand team to the European Girls' Olympiad in Informatics (EGOI) in Bonn, Germany, and oversee our attendance
- Prepared and tested problems for the NZIC – a three-round, online, high school programming contest with almost 300 participants.
- Identified and dealt with students breaking contest rules (e.g., plagiarism, using GenAI, etc.)
- Taught students data structures and algorithms concepts at the yearly January camp.

Self-Employed

New Zealand

PRIVATE TUTOR

Aug. 2023 - Present

- Private tutoring for high school students in various subjects including Calculus, Physics and French.

Countdown (now Woolworths NZ)

New Zealand

ONLINE ASSISTANT

Jun. 2022 - Nov. 2022

- Prepared online orders at Countdown Grey Lynn Central.

Skills

Programming Languages	C/C++, Python, Rust, Java, JavaScript
Technologies	Git, OpenGL, WebGL, OpenCV, TCP/IP, HTTP/SSE, SQLite3, Async Programming, DSL, Parsers & Compilers
Languages	English (Native), French (Native)

Education

University of Auckland	New Zealand
BE (HONS) / BSc CONJOINT IN SOFTWARE ENGINEERING AND MATHEMATICS (ONGOING)	Feb. 2024 - Nov. 2028
<ul style="list-style-type: none">Recipient of Jim Greatbanks Mount Albert Grammar School Engineering Scholarship for school leaversEngineering Dean's List 2024GPA: 8.7First in Course Awards: MATHS 199, MATHS 250, ENGSCI 211	
Mount Albert Grammar School	New Zealand
NCEA LEVEL 3 ENDORSED WITH EXCELLENCE	Feb. 2019 - Nov. 2023
<ul style="list-style-type: none">Member of the award-winning MAGS Centennial Choir.Member of the MAGS VEX Robotics Club	

Honours & Awards

INTERNATIONAL		
2025	7th Place , IMC Programming Contest Finals	NZ & Australia
2025	1st Place , IMC Programming Contest Preliminaries	NZ & Australia
2024	5th Place , International Collegiate Programming Contest (ICPC) South Pacific Regional Finals	Sydney, Australia
2023	Bronze Medal , 35th International Olympiad in Informatics	Szeged, Hungary
2023	Highly Commended , International Mathematical Modeling Challenge (IM ² C)	
2023	Gold Medal , French-Australian Regional Informatics Olympiad (FARIO)	New Zealand
DOMESTIC		
2023	Scholarship Award , Outstanding Physics Scholarship and Calculus, Statistics and Chemistry Scholarship	New Zealand
2023	Finalist , The Big Sing -- choir received gold (absent from finals due to IOI)	New Zealand
2023	2nd Place , New Zealand Informatics Contest	New Zealand
2022	Scholarship Award , Outstanding Physics Scholarship and Calculus and French Scholarship	New Zealand
2022	1st Place , New Zealand Informatics Contest	New Zealand

Online Accolades

LeetCode (BelgianSalamander)	Contest Rating: 2628, Second in New Zealand Global Ranking: #819, Top 0.12%
CodeForces (That_Salamander)	Contest Rating: 2182, First in New Zealand Global Ranking: #1631, Top 0.95%