# James Bao


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## Career Objective

*I am **chasing a graduate role** to grow my passion for **embedded systems** and **electronics**.*
I want to **improve human lives**—whether through hardware, firmware, or a **beautiful combination of both**.
I am always looking to **learn** new things and **grow** as a person—and I apply this mindset to everything I do.

## Soft Skills

**Problem Solving**

- I **apply** my strong **logical thinking** to challenging situations, and leave things **better than I found them**.

**Communication Skills**

- I am an effective communicator with an aptitude for **breaking down challenging concepts**.

**Leadership**

- I am passionate about intent-based leadership and **understanding** each member's **strengths and weaknesses**.

**Teamwork**

- I strive to **be an asset** to any team. I am known for my reliability—**I do not make promises I cannot keep**.

## Education

### Bachelor of Engineering (Honours)

2021 – 2024

*The University of Auckland*

- **Computer Systems** Engineering
- Cumulative GPA of 8.4/9.0 (**A** – **A+**)
- Dean's Honours List

## Experience

### Firmware Engineer Intern

Nov 2023 – Feb 2024

*EROAD Ltd* — *Auckland, NZ*

- Writing **C++ RTOS application** service with **GoogleTest** unit & component tests
- Implementation of **REST API** business logic
- File system **POSIX RAII** interactions to facilitate **remote file retrieval**
- **Security architecture**, threat modelling, and data flow diagrams

### Embedded Software Engineer Intern

Nov 2022 – Mar 2023

*Windcave Ltd* — *Auckland, NZ*

- Writing **C firmware** on STM32U585 **ARM** board
- **Rapid prototyping** of external **QSPI and OSPI** flash memories
- Creating a **FreeRTOS** Point of Sale system on CHU200TP payment terminal

## Technical Skills

### Firmware & Embedded Systems

- Experience writing **firmware** for **Atmel megaAVR** and **ARM Cortex** processors
- Hands-on with **bare-metal**, **FreeRTOS**, and Freescale MXP RTOS
- Proficiency with microcontroller **peripherals** and **serial communication** protocols
- ADCs, GPIOs, Timers, UART, SPI, I2C, connectivity, control systems, OS concurrency, Makefiles, *nix CLI

### Analogue & Power Electronics

- **Circuit & PCB design** learnt through practical application
- Wireless **inductive power transfer** and power electronics familiarity
- Extensive **hands-on** experience with **soldering** and **instrumentation equipment**
- Fluency with **LTspice** and **Altium Designer**

### Git/GitHub

- Fluency with **feature branches**, pull requests, issues, and GitHub Actions
- **7400+ contributions** accrued over the past **6 years**

**Other Languages** On top of **C/C++**, I am fluent in **TypeScript/JavaScript**, and have experience with **MATLAB**, **Python**, **C#**, **Java**, and **VHDL**.

## Project Experience

### algovision
2023 –

*docs.jamesnzl.xyz/algovision* — *Personal Project*

- **Self-directed** project to build a **algorithm visualisation tool** in hardware
- **Full design process**, parts selection, and **board bring-up**
- USB Power Delivery, custom LED matrix display, STM32U575 **ARM Cortex-M33** firmware

- Git and GitHub
- Figma
- LTspice
- Altium Designer
- STM32CubeMX
- MATLAB

### Pathfinding Robot
2023

*docs.jamesnzl.xyz/compsys301-pathfinding-robot* — *The University of Auckland*

- **Pathfinding robot** I designed in a **group of four**
- **Top team** out of all 23 teams
- Analogue **circuit & PCB** design, time- & frequency-domain **signal analysis**, using a **PSoC 5LP**, pathfinding algorithms, and motor **control systems**

- Git and GitHub
- MATLAB
- LTspice
- Altium Designer
- PSoC Creator

### Smart Energy Monitor
2022

*cs209.jamesnzl.xyz* — *The University of Auckland*

- **Smart energy monitor** I designed in a **group of four**
- **Lecturer's Choice** for **top team** out of all 40 teams
- Analogue **circuit & PCB** design, signal conditioning, using an **ATmega328PB**, writing **firmware** drivers, and UART & **Bluetooth** communication

- Git and GitHub
- LTspice
- Microchip Studio
- Proteus VSM
- Altium Designer

**Other Projects** More projects can be found on my **GitHub profile**.

## Achievements

- **Dean's Honours List** 2023
- **Dean's Honours List** 2022
- **First in Course Award** for COMPSYS 301: **Hardware Firmware Systems Design**
- **First in Course Award** for COMPSYS 209: **Analogue and Embedded Firmware Design**
- **First in Course Award** for ENGGEN 131: Introduction to **Engineering Computation and Software Development**

## Passions

**Outdoors** I have a deep love for the outdoors, and find it an amazing outlet to recharge my batteries.

**Teaching** I love crafting intuitive explanations for difficult, technical concepts—and seeing the lightbulb moment.

**Te Ao Māori** I care deeply about embracing the indigenous culture & language of Aotearoa New Zealand.

**Youth Development** I am an Officer Cadet in the New Zealand Cadet Forces, after 5 years as a cadet & 17 months as a Cadet Warrant Officer Class II.

## References

### Chris Solomon
Firmware Tech Lead

*chris.solomon@eroad.com* — *EROAD Ltd*

Chris was my EROAD **internship buddy**, and gave a wealth of knowledge towards my **successful outcomes**.

### Weili Liu
Embedded Development Manager

*weili.liu@windcave.com* — *Windcave Ltd*

Weili was a **significant mentor** and **guided** me closely during my Windcave internship.

### Dr. Duleepa J Thrimawithana
Senior Lecturer

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I am Duleepa's **Teaching Assistant**, and also assist with his **IPT Smart Car workshop** at Mānawa Mai Open Day.