Alexander Bailey

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EXPERIENCE

Avionics Design Intern **Nov. 2022 – Feb. 2023**

Rocket Lab

- Simulation and testing of Lithium Ion smart battery
- Design and manufacture of specialized test equipment
- General engineering practice e.g., documentation, testing and communication

Research Assistant **Feb. 2022 – Nov. 2022**

University of Auckland – Power Electronics Group

- Working for Dr Seho Kim
- Simulations using Ansys Icepak, Maxwell and Fluent solvers; Verifying results with practical experiments
- Using oscilloscopes, thermal cameras, and other instrumentation to test designs
- Manufactured coils for Inductive Power Transfer (IPT), built and tested 10kW inverter

Summer Research Scholarship **Nov. 2021 – Feb. 2022**

University of Auckland – Power Electronics Group

- Supervised by Dr Duleepa Thrimawithana
- Investigated cheaper alternatives to Litz wire for wireless power applications
    - Predicted DC losses accurate to <1% using Ansys 2022 R1 Litz wire modelling
    - Achieved ~2x losses with 50% the cost for low/medium power IPT
- Designed a 100W inverter with Altium Designer/LTSpice with compensation/filtering to drive designed coils
- Wrote Python software to optimize and test designs using Ansys Maxwell
- Summary slide from presentation available here

“CURES” Team Member **Aug. 2021 – Present**

Auckland Program for Space Systems

- Member of APSS V, working on Power and Solar as well as Radio subsystems
- Currently developing a modular battery management system for use in several APSS projects
- Developed a ‘P-sat’ to measure accelerometer and battery voltage data during simulated launch

ENGGEN 121 / ELECTENG 209 / ELECTENG 310 TA **Feb. 2021 – Present**

University of Auckland

- Help/Tutor Engineering students with lecture content e.g., Electrical Engineering, Programming and Mathematical Modelling.
- Ran tutorials for ENGGEN 121 – Engineering Mechanics, a first-year course in statics and dynamics

EDUCATION

University of Auckland **2020-2023 (expected)**

BE (Hons) in **Electrical and Electronics Engineering**

Auckland, NZ

- GPA of 8.75/9.0 (A+/A average)
- Dean's List 2020, 2021 (top 5% in engineering)
- President/Chair of UoA IEEE Student Branch
- Student Representative for EEE cohort

HONORS & AWARDS

- 1st place in ELECTENG/COMPSYS 209 Design Project
- 2nd place in Hella Automotive Lighting Challenge electronics design project
- Finalist in Fisher and Paykel ELECTENG 311 design project
- "Most Likely to Succeed" award in Auckland Program for Space Systems for "CURES" satellite proposal, presented by Rocket Lab founder Peter Beck
- First in Course award for ELECTENG 291 – Fundamentals of Electrical Engineering
- First in Course award for COMPSYS 209 – Computer Systems Design

SKILLS

Electronics design and verification

- In ELECTENG/COMPSYS 209, designed a PCB for a smart energy monitor that records voltage and current data and calculates power using an ATMEGA microcontroller
- Designed receiver & transmitter PCBs for an optical communication system as part of ELECTENG 310
- Experience using test equipment e.g., oscilloscopes, multimeters and LCR meters

Inductive Power Transfer

- Simulated, built and test power pads for IPT with Litz wire and novel techniques
- Ran high power tests up to 2kW
- Modeled and characterized several brands of Litz wire using Ansys Maxwell

Programming

- Worked on NZPMC project using node, GraphQL, Firebase, typescript
- Developed a full dashboard for ELECTENG 209 smart energy monitor, winning 1st place in DATAMARS smart energy challenge. Used React, Firebase and GraphQL.
- Competed at a national level in NZ Informatics Olympiad, solving problems using C++

3D Printing and Prototyping; Altium Designer; Ansys; LTSpice; CAD/CAM Mechanical Design; MATLAB; Python; C/C++; Full Stack Web Development; Embedded Systems; Linux.