

CAMERON BROOKS

London, ON · (647)331-4074

cbrook49@uwo.ca · [linkedin.com/in/Cameron-Brooks-CB](https://www.linkedin.com/in/Cameron-Brooks-CB) · [wikipedia.org/User:CameronBrooks11](https://en.wikipedia.org/wiki/User:CameronBrooks11)

Profile

Electrical engineering student with technical and leadership experience in various employment, volunteer, and extracurricular positions. I engage in engineering research and development across various fields, and I have a passion for social entrepreneurship.

Key Qualifications

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- Literature Review & Academic Paper Writing
- Systems Thinking and Design
- CAD (FreeCAD, Fusion360, Onshape)
- Development Utilities (Git, WSL, IDE)
- Spreadsheet & Document Preparation
- Electric Circuit Prototyping and Design
- Google and Microsoft workspace
- Microcontroller Programming
- Power Electronics
- 3D Printing
- Object-Oriented Programming

Relevant Experience

Technical Research Support Associate – Department of Electrical & Computer Engineering

Nov. 2021 – Present | Western University, London, ON, Canada

- Lead investigator for multiple research projects spanning the areas of hardware development, resistive heating, plastic recycling, 3D printing and sanitization.
- Many of my projects are a direct or indirectly contribution to research involving the conversion of waste plastics into alternative food in collaboration with the Defense Advanced Research Projects Agency (DARPA).
- My main project currently is researching hypochlorite production via membrane-less microfluidic electrolysis.

- Research associate under the supervision of Dr. Joshua Pearce as part of the Free Appropriate Sustainable Technology (FAST) Research Group in the Faculty of Engineering and member of the Institute for Earth and Space Exploration.

Teaching Associate – How to Change the World Organization

Feb. 2023 (contract); Nov. 2022 (contract); Nov. 2021 (participant) | Global/London, ON, Canada

- Guide and advise students as they create an action plan to address their given HtCtW challenge SDG 6 (Access to Water and Sanitation) in Thunder Bay, Ontario.
- I was previously a program participant where my group developed and proposed an action plan for malaria prevention in rural Uganda that we then published online.

Vice-President Internal – Undergraduate Engineering Society

April 2023 – April 2024; March 2021 – April 2022; April 2022 – Present | Western University, London, ON, Canada

- The Vice-President Internal for the 2023-24 academic year.
- As previous Wellness Commissioner, I was responsible for Wellness Force and chairs all Wellness Force meetings for the year as well as promoting student wellness through the planning of events, providing resources, and creating initiatives.
- I was previously the sustainability coordinator for the Sustainability Committee where my primary role was to track and minimize the environmental footprint of the Undergraduate Engineering Society.

Student Ambassador – Engineering Recruitment and Outreach

Oct. 2022 – Present (volunteer) | Western University, London, ON, Canada

- Student Ambassadors are students with first-hand experience with the various aspects of undergraduate engineering at Western University such as co-op, programs, research, clubs and teams, and anything else related.

Student Ambassadors run informative Q&As and appear in profiles to provide information about their experiences.

Volunteer Engineering Intern – Field Ready

Jan. 2022 – Jan. 2023 (volunteer) | Global/Remote

- My primary focus was with the Rapid Response Manufacturing project based in Fiji and will be deployed in the South Pacific.
- To further develop the capabilities of the team and its members I am assisting with a memorandum of understanding with Western University

whereby Field Ready employees can get advanced degrees in their field while continuing their work.

Swimming and Lifesaving Instructor – Self-Employed

June 2020 – Aug. 2020 (self-employed); April 2021 – Aug. 2021 (self-employed)
| Uxbridge, ON, Canada

- I managed and instructed my own private, at-home aquatics lessons business geared towards busy high-end clientele.
- This entrepreneurial endeavour allowed me to leverage my previous training in aquatics and first response to teach the swim kids program as well as the Bronze Lifesaving Awards in accordance with Red Cross standards.

Education

University of Western Ontario

- Bachelor of Engineering Science - Electrical Engineering (BESc '24)
- Key courses: Design, Electric Circuits, Object-Oriented Programming, Digital Logic, Microcontrollers, Economics, Electromagnetics
- Progression: Year 1 Medical Sci. (2020/21), Year 2 Electrical Eng. (2021/22), Year 3 Electrical Eng. (2022/23)

Awards and Honours

- Zenith Canada Pathways Foundation Space Fellowship Mentee 2023
- Institute of Electrical and Electronics Engineers, Student Member 2021-2023 (98525168)
- Ontario Professional Engineers Foundation for Education Scholarship 2022
- Bill & Barbara Etherington Fellowship Award 2022
- Ezz Amr Prize for Most Feasible Business Pitch 2021
- Western University Scholarship of Distinction 2020
- Certificate of French Immersion Studies 2020
- Schulich Leader Nominee 2019

Projects and Written Works

FAST Research Group

Additive Manufacture Breakout Boards (AMBB) [complete]

- Electronic designers are constantly faced with shortages and incompatibilities, to address this I created a parametric 3D printable device that allows conversion between chip packages, is reusable, and costs 88% less than traditional methods.

- My findings were compiled into an academic paper that is currently under review to be published in *Inventions* which includes the full technical specifications, device validation, economic analysis, and discussion for future work.

Hypochlorous Acid Generator [in-progress]

- To address the global need for safe, cost-effective sanitization I am designing an open-source device that can produce hypochlorous acid, a powerful disinfectant, via membrane-less microfluidic electrolysis. This will give individuals and institutions with limited resources access effective sanitization that is safe, cost effective, and locally produced.

Resistive Heating Elements and Controls [multiple ongoing projects]

- This multi-project initiative aims to reduce costs and improve efficiency of systems requiring resistive heating through use of off the shelf parts such as microcontrollers and high-temperature wire to create custom heating solutions.
- Main applications currently include an industrial sheet press for plastic recycling and a bioreactor for pyrolysis.

University of Western Ontario

ECE 2240A Final Project [complete]

- The purpose of this project was to apply our knowledge of circuit design and simulation software (microcap, EAGLE) to design a circuit, and then implement it using appropriate components to make a function generator.

ECE 2231A Final Report [complete]

- This report describes the current-voltage characteristic of the Zener diode through theoretical discussion as well as analysis of experimentally obtained data.

ECE 2242A Final Project [complete]

- The purpose of this project was to apply our knowledge of microcontrollers and electronics prototyping to design a solution to a real-world problem. We designed *The AutoMorn* to streamline and improve the morning routine of students.