

Jack Caldwell

LinkedIn

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EDUCATION

QUEEN'S UNIVERSITY

MASC IN ELECTRICAL AND
COMPUTER ENGINEERING

Dec 2021 | Kingston, ON

Cum. GPA: 4.14

QUEEN'S UNIVERSITY

BASC IN ELECTRICAL ENGINEERING
WITH PROFESSIONAL INTERNSHIP

April 2019 | Kingston, ON

SELECT COURSEWORK

GRADUATE

Vehicle Control and Navigation

Design for Robots and Telerobots

Machine Vision

Machine Learning/Deep Learning

UNDERGRADUATE

Bioinformatic Analysis

Modelling and Computer Control

Introduction to Robotics

A.I. and Interactive Systems

Image Processing and Computer Vision

Sensors and Actuators

Linear Control Systems

Discrete-Time Signals and Systems

Probability and Random Processes

Microprocessor Systems

Computer Architecture

Digital Systems

Fundamentals of Information Structures

Intro to Computer Programming for

Engineers

SKILLS

PROGRAMMING

Over 5000 lines:

Python • Matlab • \LaTeX • C++

Over 1000 lines:

C

Familiar:

Java • Assembly • PLEXIL

DEVELOPMENT ENVIRONMENT

Proficient:

GIT • VS Code • Arduino • Linux • ROS •

Shell

Familiar:

Eclipse • Visual Studio • Gazebo • CAD

WORK EXPERIENCE

MDA | MEMBER OF TECHNICAL STAFF

Feb 2022 - Present | Brampton, ON

- Autonomy and AI development for the Canadarm3.
- Subject matter expert for model-based collision avoidance, design and development of algorithm (C++ and Matlab).
- Lead Autonomy and AI Designer for Lunar Surface Exploration Initiative (LSEI) power generation study. Responsible for autonomy and control system design and development for lunar nuclear reactor system.

OFFROAD ROBOTICS | RESEARCH ASSISTANT

Sep 2019 - Dec 2021 | Kingston, ON

- Design of $82\times$ more computationally efficient learning-based (via **Gaussian Process Regression**) nonlinear **model predictive controllers** (Python and C++).
- Researching and applying robotic manipulator control algorithms on a Kubota R520S robotic loader (Python, C++, ROS).

MACLEAN ENGINEERING | SIMULATION ENGINEERING SPECIALIST

May - Sep 2019 | Remote

- Modelling of mining equipment for automation (C++, Python, Gazebo/ROS).
- Forward kinematics and controller development with ROS framework.

OFFROAD ROBOTICS | RESEARCH ASSISTANT

May 2018 - Sep 2018 | Kingston, ON

- Model MacLean Engineering machines and prototype systems in Gazebo/ROS.
- Design electrical control system, and build/test tele-operated prototype, since used in multiple Master's theses.

MACLEAN ENGINEERING | ELECTRICAL DESIGNER

May 2017 - May 2018 | Collingwood, ON

- Designed (Auto CAD) electrical control systems for **15** machine capital orders.

TEACHING EXPERIENCE

QUEEN'S UNIVERSITY | TEACHING ASSISTANT

ELEC490 Electrical and Computer Engineering (ECE) Project

- Supervised **16** teams of **4** students in ECE, managing schedules and workflow, provided engineering guidance and feedback.

APSC142 Introduction to Computer Programming for Engineers

- Test marking and providing tailored feedback to improve student's programming skills in C.

APSC200 Engineering Design and Practice II

- Supervised **4** teams of **5** students in ECE, provided guidance, marking, and feedback to improve student's professional engineering skills.

AWARDS

2020 top 9/1029 Code Life Ventilator Challenge

PUBLICATIONS

- [1] J. Caldwell and J. A. Marshall. Towards efficient learning-based model predictive control via feedback linearization and gaussian process regression. In *2021 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, pages 4306–4311, 2021.