WILLIAM WARD
Engineering Physics Student

EDUCATION

2018-2023

B.Eng. Engineering Physics
McMaster University

Co-op program
GPA: 3.95 / 4

SKILLS

Embedded C & C++
Python
Java
C# & .NET
MATLAB
Linux
Git
PCB Design
Analog Electronics
Digital Electronics
Oscilloscope Usage
Autodesk Inventor
FreeRTOS
Soldering
3D Printing
Fusion360
NI Multisim
Zemax OpticStudio
EasyEDA
Confluence + JIRA
Numerical Data Analysis

AWARDS

Eagle Scout Award
Boy Scouts of America
2017

NSERC USRA
McMaster University Biophotonics Research Group
2019

CONTACT

Birmingham, Michigan
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My Profile Site

WORK EXPERIENCE

Software Engineer Intern — May 22 - Aug 22
KLA Corporation - FastScan R&D Group

Collaborated with an interdisciplinary team to build an optical test bench designed to quantify the response of a PN junction detector for an electron beam column

- Implemented a multi-threaded application to operate a test bench with Python
- Wrote hardware driver libraries in Python to control coupled linear translation stages, an oscilloscope, a pulse generator, and an optical source
- Developed a baseline understanding of scanning electron microscopy & electron optics
- Assembled laser & associated optical components; performed optical alignment

Command & Data Handling Team Lead — Apr 22 - Jul 22
McMaster Interdisciplinary Satellite Team (NEUDOSE)

As team lead, I was head of software development for the Command & Data Handling sub team. I managed a team of 7 people and continuously worked with systems level engineers to facilitate development of satellite flight software.

- Led technical development of the Command & Data Handling Finite State Machine with over 180 commits
- Performed and submitted code reviews on a weekly basis

Embedded Software Specialist — Aug 21 - Apr 22
McMaster Interdisciplinary Satellite Team (NEUDOSE)

Developing embedded software using the Gomspace SDK & custom libraries / packages to control the satellite's On-Board Computer

- Designed a finite state machine to control satellite interactions between subsystems
- Successfully integrated CubeSat Space Protocol (CSP) communication architecture with 3 existing sub-services
- Collaborated with a team of 7 software specialists on a team repository using Git

Co-op Research & Development Scientist — Sep 20 - Sep 21
Mesomat

Collaborated with other engineers on 32 software packages, 15 electrical systems and 2 electromechanical systems for Mesomat.

- Designed 15 unique PCBs utilized by Mesomat's data acquisition platform and robotic production line system
- Spearheaded performance analysis of 2 unique event detection algorithms with Python
- Designed & built an automated electromechanical production robot on a $5k budget
- Increased the reliability & efficiency of the sensor production process by 50%
- Developed desktop application for software version control, decreasing software distribution time by 25% for the management team
- Used C# to implement a real time signal processing algorithm for event detection
- Utilized Git for version control of 32 different collaborative software projects
- Improved robustness of existing production robotic system before overhauling the entire system; reduced downtime by 40%
- Overhauled a lacking client interface by developing a software distribution web application

COURSES

- Electronics: Non-Linear & Active Components
- Electronics: Embedded Systems
- Solid State Devices
- Semiconductor Junction Devices
- Analog & Digital Circuits
- Electromagnetism
- Computational Multi-Physics
- Signals & Systems
- Physical Optics
- Numerical Methods
- Data Structures, Algorithms & Discrete Mathematics
- Mathematical Physics I & II
- Quantum Mechanics
- Thermal System Design

INTERESTS

- Olympic Weightlifting
- Backpacking
- Rugby

Undergraduate Research Assistant — May 20 - Aug 20
McMaster Biophotonics Research Group

Conceived of and implemented a graphical user interface to interact with an existing controller infrastructure for an ultra-fast fiber optic laser micro machining station

Orbital Simulation Specialist — Dec 19 - Sep 20
McMaster Interdisciplinary Satellite Team (NEUDOSE)

Assisted in development of orbital models of the satellite in order to implement attitude determination and control using Passive Magnetic Attitude Control

TEACHING EXPERIENCE

Support Teaching Assistant — 2019 - Present
Integrated Biomedical Engineering - McMaster University

Spent 3 years assisting students in a laboratory environment, encouraging further development of computing, computer-aided design & professional communication skills

Instructional Teaching Assistant — Sep 20 - Apr 21
Integrated Biomedical Engineering - McMaster University

Prepared & delivered labs to teach first-year engineering students the basics of computer-aided design and programming on a weekly basis

Course Developer — May 19 - Aug 19
Integrated Biomedical Engineering - McMaster University

Created and updated Integrated Biomedical Engineering & Health Science lab content for 24 labs focused on CAD & Coding

- Generated a supplementary database of 66 Python Video Tutorials and associated educational slides in the interest of enhanced learning
- Generated lesson plans spanning the entire academic year to encourage a problem-based learning approach to relevant engineering challenges

ACADEMIC PROJECTS

Embedded PID Controller — April 2021
Embedded Systems

- Designed and implemented a PID controller on an embedded platform, interfaced with a MATLAB Graphical User Interface
- Successfully tuned the PID system to within $\pm\ 2\,\deg C$, with minimal overshoot and steady-state oscillations

Ultrasonic Range Finder — Dec 2021
Non-Linear Electronics

- Cooperated with a team of other engineers to successfully design and build an ultrasonic range finder
- Succeeded in building a device with an accuracy to within 1 cm up to 99 cm
- Constructed the device using 40 base-level analog and digital components such as amplifiers & logic gates

Preheat Thruster Optimization — Mar 2020
Computational Multi-physics

Optimized the design of a spacecraft thruster heating system; Utilized background in heat transfer physics to construct a simulation model for design verification