WILLIAM WARD

Engineering Physics Student

SKILLS

C# & .NET	1 yr
Python	3+ yrs
Java	1 yr
Embedded C & C++	2+ yrs
MATLAB	2 yrs
Linux	< 1 yr
Git	2+ yrs
MSSQL	1 yr
FreeRTOS	< 1 yr
Html/CSS/JS	1 yr
NI Multisim	1 yr
PCB Design	1 yr
EasyEDA	1 yr
Autodesk Inventor	3+ yrs
Fusion360	3+ yrs
3D Printing	3+ yrs

EDUCATION

2018-2023

B.Eng. Engineering Physics
McMaster University

Co-op program
GPA: 3.95 / 4

CONTACT

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PROFILE

I am an Engineering Physics student with a passion for embedded systems and an ambitious attitude. I have a broad skill set which can be described as Systems Engineering.

WORK EXPERIENCE

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

In this role, I designed software packages, electrical systems and electromechanical systems for Mesomat. I worked on various projects; including our sensor production line & in-house / external software tools.

- Desktop application development for production line control
- Desktop application development for software version control & distribution
- Web Application development for a more professional and streamlined client interface
- Electrical system design for custom electronics packages for clients
- Mechanical system design for automated sensor production
- Software & Firmware development / maintenance for production line systems
- Maintenance of existing automated systems

Technologies include:

- C# & Java for desktop application & web application backend development
- EasyEDA for electrical system & PCB design
- MSSQL Server Interface from C# for software distribution management
- Python for performance analysis of sensor event detection algorithms
- C/C++ for firmware development on custom micro-controllers
- Git for version control of collaborative software projects
- HTML/CSS/Bootstrap4 for web application front-end development
- Nullsoft Installer Scripting System for generation of custom software install packages

Achievements include:

- Design & assembly of an automated production line robot to produce Mesomat sensors
- Creation of an ASP.NET web application in order to distribute software to clients
- Development of software packages for clients that interface with Mesomat electronics
- Development of electronic systems and subsequent PCBs for clients
- Developed a custom microcontroller based on the ESP-32 for client electronics

AWARDS

Eagle Scout Award
Boy Scouts of America

I was awarded the highest award in scouting in 2017.

NSERC USRA
McMaster University

Undergraduate Student Research Award; utilized to fund my work with the McMaster Biophotonics Research Group.

RELEVANT COURSES

- Computational Multiphysics
- Mathematical Physics I
- Mathematical Physics II
- Thermal System Design
- Electronics I: Non-Linear & Active Circuits
- Electronics II: Embedded Electronics
- Physical Optics
- Signals & Systems
- Data Structures, Algorithms & Discrete Mathematics
- Semiconductor Junction Devices

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

Responsible for developing a Graphical User Interface to interface with existing controller infrastructure for an ultra-fast fiber laser micro-machining station

- Developed a C++ GUI and associated back-end to control a high power ultra-fast pulsed fiber laser system
- Replaced outdated electronics and associated software controlling various components of the laser system
- Participated in biweekly SPIE sponsored biomedical optics research paper review and team presentations

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

Responsible for developing orbital models of the Satellite in order to implement attitude determination and control

- Developed a proficiency in STK (Systems Tool Kit) – an aerospace industry standard software used for mission modelling, simulation, data analysis and visualization
- Attended weekly systems engineering meetings and presented simulation results
- Regularly updated documentation on Confluence – a management and information organization software
- Utilized an existing attitude determination algorithm to develop an embedded C package for attitude determination on the OBC (the On-Board Computer on the satellite)
- Used STK to design a virtual space environment and independently verify the NEUDOSE satellite's Passive Magnetic Attitude Control (PMAC) System
- Designed a python script to process attitude data and format the data properly for analysis in STK

ACADEMIC PROJECTS

Preheat Thruster Optimization Mar 2020
Computational Multi-physics

- Optimized the design of a spacecraft thruster system to ensure cost efficient manufacturing
- Utilized background in heat transfer physics to design a simulation model for a spacecraft thruster system-heater
- Implemented my custom model in Multi-physics simulation software (FlexPDE)
- Proposed my model as a design solution in the form of a technical engineering report

Sequential Logic Design Mar 2020
Analog & Digital Circuits

- Analytically designed a sequential logic circuit to cycle through a predetermined 9-digit number
- Built and simulated the circuit in National Instruments Multi-sim for design verification
- Applied various simplifications to optimize the circuit design to minimize the number of logic gates required

TEACHING EXPERIENCE

Instructional Teaching Assistant Sep 20 - Apr 21
iBioMed - McMaster University

Responsible for preparing & delivering labs to teach first-year engineering students the basics of Computer-Aided Design and Coding

- Utilized an online platform to deliver course content
- Served as a mentor and academic resource for first year engineering students
- Provided students with appropriate and constructive feedback to encourage further development of technical skills and communication
- Used AutoDesk Inventor to deliver CAD lesson content
- Used Python to teach basic coding skills

Support Teaching Assistant Sep 19 - May 20
iBioMed - McMaster University

Responsible for creating lab content to be delivered with the goal of teaching CAD & Coding

- Applied technical skills to enhance learning in an academic environment, specifically Python and CAD
- Participated in implementation of newly developed course content, as discussed in weekly meetings
- Served as a mentor and academic resource for first year engineering students
- Provided students with appropriate and constructive feedback to encourage further development of technical skills and communication

Course Developer May 19 - Aug 19
iBioMed - McMaster University

Responsible for creating lab content to be delivered with the goal of teaching CAD & Coding

- Explored and implemented various methods for effectively teaching problem solving skills in the context of computing, Computer Animated Design, and engineering design
- Generated lesson plans spanning the entire academic year to encourage a problem-based learning approach to relevant engineering challenges
- Developed a supplementary database of 66 Python Video Tutorials and associated educational slides in the interest of enhanced learning
- Demonstrated high levels of organization through weekly collaboration and progress reports with coworkers and supervisors to ensure proper content coverage in the upcoming school year