

Michael Astwood

mastwood101@gmail.com · +1 (204) 797-1337

Waterloo, Ontario, Canada



SKILLS

- **Programming**

Python, Tensorflow, Pytorch, Gekko, Scipy, Anaconda, Scikit-Learn, MATLAB, CasADi, Mathematica, R, Javascript, NodeJS, C++, C#

- **Software**

L^AT_EX, Adobe Creative Suite, Blender3D, GROMACS

EXPERIENCE

- **Brock University Dept. of Physics**

Research Assistant - BUFA Explore Grant
Researching spacetimes with multiple histories and time travel.
May 2021 - September 2021

- **iGEM Waterloo**

Mathematics and Modelling Team Lead
Investigated applications of mathematical synthetic biology to various agricultural and industrial problems. Performed simulations with FeNiCS, GROMACS, and Scipy.
February 2018 - January 2021

- **Univ. of Waterloo Dept. of Applied Math**

Research Assistant - MURA Grant
Conducted research in geometric control theory and microscopic fluid mechanics. Used Mathematica and Python to solve differential equations and optimization problems.
May 2020 - September 2020

- **Univ. of Waterloo Dept. of Applied Math**

Research Assistant - NSERC USRA Grant
Researched optimal experimental design theory. Used MATLAB to simulate stochastic processes and perform statistical optimization.
May 2019 - September 2019

AWARDS & RECOGNITION

- **Gold Medal, Best in Category**

iGEM Competition 2020

- **National Champion**

CSA Spaceapps Challenge 2019

- **Undergraduate Student Research Award**

NSERC 2019

EDUCATION

- **B.Sc. Honours Mathematical Physics**

University of Waterloo, Ontario
Minors in Pure Mathematics, Astrophysics
Expected Graduation: June 2021

- **International Baccalaureate Diploma**

Westwood Collegiate, Winnipeg, Manitoba
Graduated June 2017

PROJECTS

- **A CNN Approach to Gravitational Wave Signal Detection**

Replicated and improved on machine learning model from PhysRevD.103.024040. Added Bayesian component to network design. PHYS490 Final Project. Scored a grade of 100% on final result.
Pytorch, BLiTZ, Tensorflow 2021

- **Geonomaly**

Used advanced signal processing to detect anomalies in geomagnetic data. Won best in category nationally at CSA Spaceapps 2019.
Python, PyHHT 2019

SCHOLARLY WORK

- **Born Geometry and Relative Locality.**

Bachelor's Thesis in the field of complex geometry and theoretical physics. Supervised by Dr. Ruxandra Moraru. 2021

- **Remote Control of Particles in Microhydrodynamic Suspensions.**

Conference poster and presentation at CUPC2020. Manuscript in Progress. 2020-Present

- **An Optimal Experimental Design Software Package for Nonlinear Models in Biology.**

Co-Author of Poster at SIAM OP2020. 2019 - Present

- **REMINE: Closing the Loop for Heavy Metal Waste.**

Presented at iGEM2020. Won gold medal and best-in-category award. 2020

- **Engineering Herbicide Tolerance in Rhizobia.**

Conference Poster at BioTEC 2019. Presented at iGEM2019, oGEM2019. Won silver medal. 2019