

# Hayden Goodfellow |

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**Languages:** C, C++, Python, C#, Verilog, Assembly (ARMv7-A)

**Web:** JavaScript, JQuery, CSS, HTML, Bootstrap

**Technologies:** PyTorch, NumPy, Git, PostgreSQL, OpenCV, Unity, Linux, LaTeX

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## Education

**Bachelor of Applied Science in Computer Engineering** - University of Toronto

· Minors in Machine Learning and Engineering Business

Graduation Expected 2022

## Work Experience

**Software Developer** - Amnesia Escape Games

Summer 2019

- Developed software to monitor and control a distributed system containing over 30 devices such as RFID readers, actuators, and sensors which were connected to 11 Arduino Nano controllers
- Created, using C++, a multithreaded master controller for the entire system which communicated using an RS-485 half-duplex bus and socket connections
- Used OpenCV in Python with remote cameras connected via sockets to create part of a puzzle
- Utilized a PostgreSQL database to log and analyze sensor data for testing and balance purposes

**District Referee** - Ontario Soccer Association

2012 - 2018

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## Projects

**Machine Learning & Computer Vision Team** - UTRA - Autonomous Rover

Python • PyTorch

NumPy • OpenCV

- Currently developing, with PyTorch and OpenCV, a ML model which can detect various road signs and markings and instantaneously relay this information to other systems on the rover
- Created, with Python and OpenCV, a web scraper which gathers images and applies multiple perspective transforms to generate large, high-quality datasets

**Geographic Information System**

C++ • LibCurl • GTK

- Developed, using C++, a full-scale multithreaded mapping application tailored to users with vision impairments, such as colour blindness
- Retrieved and displayed real-time weather and transportation information using LibCurl
- Utilized optimal algorithms/data structures to ensure strong performance (such as A\* and KD-trees)

**Social Isolation Simulator**

C

- Created, using C, a simulator showing the effects of social isolation on a pandemic
- Developed a custom VGA controller which utilizes page flipping for smooth animations

**User-Level Multithreading Package**

C

- Full multithreading package for user-level threads which virtualize one or more kernel threads
- Includes blocking/sleeping threads and preemptive or cooperative thread scheduling
- Assured thread safety with self-implemented blocking and spin locks using atomic instructions

**Autonomous Robot** - Space Engineering & Exploration Kompetition (SEEK)

Arduino • C

- Developed an autonomous AI for a rover which was capable of navigating quickly and safely around obstacles and inclines. Rover could also be controlled manually using Bluetooth
- Optimized our pathfinding algorithm to ultimately finish in 2nd out of over 40 teams