


# Abhinav Agrahari

## MECHATRONICS ENGINEERING

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AbhinavA10 

### Summary of Skills

#### Languages:

- C, C++, Java, Python, HTML/CSS, MySQL
- Familiar with Bootstrap
- Knowledge of ROS, scikit-learn, TensorFlow, and Vue.js

#### Tools:

- Git, MATLAB, Watson EAGLE, SolidWorks, AutoCAD, Fusion360, GD&T

#### Soft Skills:

- Teamwork, leadership and communication skills
- Flexibility developed through student design teams
- Able to learn quickly, creative, minimal supervision required

### Education

University of Waterloo

Mechatronics Engineering

**GPA 3.98** (2018-2023)

Relevant Courses:

- Data Structures and Algorithms

### Awards

- Recognized for Academics on **Dean Honor's List**, 1<sup>st</sup> semester **Mechatronics**: **GPA 3.98** (2019)
- **Governor General's Bronze Academic Medal** for Highest Academic Average (2018)
- University of Waterloo, **President's Scholarship of Distinction** (2018)
- Achieved **top 25%** in the Pascal and Fermat Math Contest (2016-2017)

### Interests

- Robotics, photography, woodworking, playing various musical instruments, Inner workings of electronics and repair processes

### Projects

**Machine Learning Projects** (Python, sklearn, TensorFlow) *Dec 2018 – Current*

- Implemented the scikit-learn library to create a handwritten digit classifier using the MNIST dataset
- Currently learning TensorFlow through the Machine Learning Course by Google Developers

**Android Note App** (Android/Java)

*Feb 2019*

- Created text-based note taking app for Android Oreo 8.1, using object-oriented programming concepts, based on an SQLite Database

**WATHealth | StarterHacks Hackathon** (Firebase, Vue.js, Watson) *Jan 2019*

- Co-created online forum for mental health, using Firebase and Vue.js
- Integrated the Tone Analyzer from IBM's Watson API to parse a user's posts, and determine the overall emotion of the user over time

**Matrix-Solving Robot**

*Oct 2018 – Dec 2018*

- Collaboratively prototyped a robot, to scan a printed matrix, and output the solution using Gauss-Jordan elimination
- Co-created image recognition algorithm for printed digits based off the concept of Hamming Distance

**PS2 Controller Interface** (circuits.io, C)

*Oct 2017 – Feb 2018*

- Designed and etched a PCB to interface a Sony PS2 controller with a PIC Microcontroller, for the purpose of controlling a remote-control car
- Programmed and debugged PIC Microcontroller to handle the standard PS2 communication protocol (SPI)

**Flex Sensing Robotic Hand** (Fusion 360, C)

*Apr 2017 – June 2017*

- Designed and 3D printed robotic hand capable of mimicking a user's hand movements through a flex-sensing glove, that could be further developed to function as a prosthesis

**Music-synced Light up Gramophone** (C)

*Oct 2017 - Jan 2018*

- Facilitated design of low pass filter, to sync flashing of NeoPixel LED light strips with bass of a song being played, for high school arts festival

### Extra-Curriculars

**UW Alternative Fuels Team**

*Sep 2018 - Current*

- Learning basics of MATLAB for vehicle automation and object detection purposes, as part of the software sub-team
- Currently co-designing a CAN interface PCB for vehicle communication

**MIT's Battlecode Competition**

*Jan 2017*

- Designed an AI bot in Java to compete in MIT's Battlecode competition

**Junior Achievement's Company Program**

*Nov 2015 - May 2016*

- Co-founded a company as Vice-President of Finance, prepared financial statements, and won Best VP of Finance Award

### Other Experience

**Cashier | Walmart**

*Sep 2017 – Aug 2018*

- Followed protocol to safely scan and package goods for customers

**Supervisor of Senior Robotics | Brickworks Academy**

*Jul 2015 – Aug 2015*

- Mentored 6 - 14-year-old participants in the Senior Robotics program to design and program LEGO Mindstorms Robots, as a volunteer