


# Ibrahim Helal

## Robotics Software Engineer

A highly motivated engineering professional with an initiative and startup spirit, driven to build innovative solutions in the autonomous systems field.



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## WORK EXPERIENCE

### Software Engineer

#### Miso Robotics

09/2021 - Present

Pasadena, CA

*Miso Robotics exists to make restaurants safer, easier and friendlier.*

- Software interface architecture - (ROS)
- Motors and sensors driver development -(C++)
- State Machine system executive developemnt - (C++)
- Firmware - (C++)
- Idea validation and burning down project risks - (Jira/Wiki)
- Software diagnostic - (ROS)
- System validation tool developemnt - (Python)
- System configuration tool development - (Python)
- UI for testing system components upon assembly - (Python/Tk)

### Founder

#### ANTS Robotics

09/2019 - 08/2021

Vancouver, Canada

*ANTS Robotics is dedicated to developing affordable robotic systems for SMEs to automate and scale tasks.*

- Software engineering (C, C++, Python, ROS)
- Autonomy software stack engineering
- System architecture designer
- Building robot simulations and transformation tree for Gazebo
- Control Theory
- Business model canvas development
- Product testing and idea validation
- Scrum Master

## EDUCATION

### BASc Mechatronic Systems Engineering

#### Simon Fraser University

09/2016 - 08/2021

- **Capstone:** Autonomous Indoor Mobile Robot
- Industrial Control Systems
- Machine Learning
- Feedback Control Systems
- Vision Algorithms for Mobile Robotics
- Real-Time Embedded Systems
- Systems Modeling and Simulation

### Robotics Software Engineer - Nanodegree

#### Udacity

09/2019 - 12/2019

- ROS Essentials
- SLAM
- Navigation
- Localization
- Path Planning
- Computer Vision

### Charles Chang Certificate in Innovation and Entrepreneurship

#### Simon Fraser University

06/2018 - 04/2021

- Entrepreneurship & Innovation
- Foundations of Innovation
- Managerial Accounting
- Microeconomics
- Resourcing New Ventures
- Project Management
- Financial Accounting

## CERTIFICATES & ONLINE COURSES

### Robotics Operating System (ROS) (08/2017)

*FH Aachen University of Applied Sciences (Germany)*

### Siemens Mechatronic Systems Certification (08/2018)

*Siemens*

### Basics of CNC Programming And Machining (02/2017)

*Simon Fraser University*

### Certified SOLIDWORKS Mechanical Design Associate (12/2018 - Present)

*Credential ID: C-ML7V7TA224*

### Fundamentals of Deep Learning for Computer Vision (06/2019 - Present)

*NVIDIA*

## WORK EXPERIENCE

### Robotics Entrepreneur Gripix

11/2019 - 09/2021

Vancouver, Canada

*As a young robotics entrepreneur, I took the initiative of accelerating the robotics educational field by developing a state of the art robotic kit*

- A record of 2600 robotic platforms deployed to educational facilities in Canada and China
- Took the project from idea to production and documentation
- Designing the product's CAD model
- Rapid Prototyping - 3D printing of the product
- Developing business model canvas and business idea
- Hardware interface software library engineering
- Built a structured robotics curriculum for high school and universities
- Building Docker containers for production-ready software
- Market reaserch & customer discovery

### Robotics Hardware Testing

#### OTTO Motors, a division of Clearpath Robotics

04/2019 - 08/2019

Waterloo, Canada

*At OTTO, flexible and intelligent autonomous mobile robots for industry are designed*

- Integrated multiple software stacks, APIs and ROS to develop test plans for multiple robots and managed them through slack
- Designed hardware testing plans and executed them
- Worked with different disciplinary teams to test and report on new sensors for new versions of the OTTO 100

### Robotics Hardware Designer

#### OTTO Motors, a division of Clearpath Robotics

01/2019 - 04/2019

Waterloo, Canada

*At OTTO, flexible and intelligent autonomous mobile robots for industry are designed*

- As a Wire harness designer, I have developed all the wiring for the OTTO 100 as production-ready designs
- Adhering to IPC/WHMA-A-620D wire harness standars
- Maintained the wire harness designs in a PLM system
- Collaborating with wire harness manufacturer to deliver orders on time

## HONOR AWARDS

### BCIT - Excellence Award

*Awarded the highest British Columbia Regional competition award*

- Top 10 Robot Skills Ranking
- Top 10 Robot Software Programming Ranking
- Top 10 Tournament Ranking

### Achievement Recognition Letter

*Stephen Harper (Former Prime Minister Of Canada)*

- Have been recognized as an outstanding student for achievements received in the VEX Robotics Competitions.

## ACHIEVEMENTS & AWARDS

### Robotics Startup Entrepreneurs' Choice Award

*As a robotics entrepreneur, with the help of my team, we successfully got picked to win the Entrepreneurs' Choice Award during our incubation period at Venture Connections*

### VEX Robotics World Championship (01/2012 - 06/2014)

*•1st and 3rd place over 10,000 teams representing Canada • World Championship Division Champion • Create Award*

### VEX Robotics Competition

*Received Tournament Performance Awards: • BCIT Robotics Competition Excellence Award • Multiple Design Awards • Tournament Champions • Build Award*

## SIGNIFICANT PROJECTS

### Flippy Lite the robot - Miso Robotics (09/2021 - Present)

- Championed the deployment and development of Flippy Lite the robot into the first Chipotle restaurant
- With a Go To Market mindset and a timeline of less than 1 year, the system was developed and deployed to site.
- Owning approximatley 40% of the system architecture design and software packages

### Miso Custom Dispenser - Miso Robotics (06/2022 - Present)

- Took leadership on the system design and architecture
- Developed the electrical, firmware and software of the product in an astonishing duration of 3 months
- Took the project from idea to prototype, to production.

### Omni-directional Autonomous Mobile Robot (ROS, Python, C++, Bash Script)

- Bootloader (Bash Script) [↗](#)
- Ethernet Firmware (C++, ROS) [↗](#)
- Simulator (XML, C++, ROS) [↗](#)
- Inverse Kinmatic Model (C++, ROS) [↗](#)
- Robot State Updater (C++, ROS) [↗](#)

### Multi Agent Robotic Simulation (Gazebo, ROS, C++) [↗](#)

### 6-DOF Robot Manipulator (Mechanical)

### Smart Educational Robot (Sample Code) [↗](#)

### Full Stack Robot Programming Library (Sample Code) [↗](#)

### Robot Web Graphical Programmer [↗](#)

## WORK EXPERIENCE

### Robotics Software Engineer (Localization) Advanced Intelligent Systems Inc.

09/2018 - 12/2018

Burnaby, Canada

AIS is a practical autonomous robotics company with the IP to create affordable custom robots

- Developing Visual Odometry Algorithms (Python)
- Debugging code written in ROS and C++
- Improving Robot Localization and Navigation performance
- Researching on Outdoor Navigation methods and algorithms
- Designing and maintaining robot hardware and electrical components
- Developing simulations for new products using Gazebo

## SOFTWARE SKILLS

ROS C++ Python Git Unit Testing

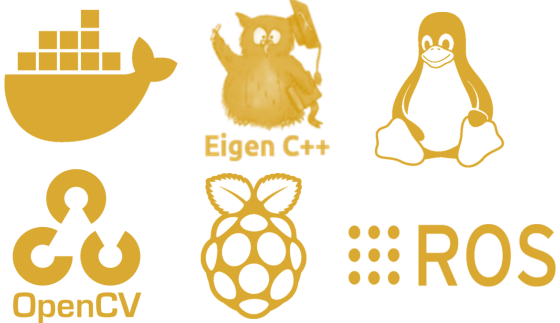
TDD Gazebo Matlab Solidworks

Arduino 3D Printing PLM Docker Linux

JIRA GDB Valgrind CMake PCB Design

Harness Design SITL HITL UML

## TECHNOLOGIES & FRAMEWORKS



## LANGUAGES

English	■	■	■	■	■
Arabic	■	■	■	■	■
German	■	■	■	■	■

## REFERENCES

Brian McLean - Director of Hardware Engineering at Clearpath Inc.

"Ibrahim has always worked with dedication and application. He readily throws himself at any problem. He applies himself diligently to learn whatever skills or knowledge he needs to complete the task. Ibrahim consistently delivered above and beyond what was expected of him and worked to improve himself. I recommend Ibrahim wholeheartedly for future employment in robotics and technical fields."

Contact : <https://www.linkedin.com/in/brian-mclean-7b0792/>

David Harper - Staff Electrical Design Engineer at Clearpath Inc.

"Ibrahim proved to be a quick study and a diligent worker. He was introduced to and trained in wire harness design and hardware testing. His skills in hardware and ROS became apparent as Ibrahim volunteered for project after project with his infectious enthusiasm for robotics. Ibrahim became a valuable member of our team in short order and has been sorely missed after his 8 months at OTTO Motors ended. Its hard to find dedication like this."

Contact : <https://www.linkedin.com/in/david-harper-9a02231/>