

# Erik C.M. Johnson

ENGINEER IN TRAINING · ELECTRONICS, COMPUTATION AND SYSTEMS

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## Objective

My objective is to contribute to the application of robotics to everyday life. To further this objective I am seeking employment in the robotics industry in order to use and expand my technical skills.

## Education

### Carleton University

Ottawa, Ontario, Canada

B.ENG IN ELECTRICAL ENGINEERING (MINOR IN MATHEMATICS)

Sept. 2012 - Present

- Currently completing last year of studies, graduation date: April 2017
- CGPA of 11.78 / 12 (A+) or GPA of 3.97 / 4
- Five co-op work terms completed (total of 20 months)

## Work Experience

### Carleton University

Ottawa, Ontario, Canada

MATHEMATICS TEACHING ASSISTANT

Sept. 2016 – Dec. 2016, Sept. 2015 – April

2016, Sept. 2013 – April 2014

- Led tutorials, offered individual assistance and administered tests for the following courses:
  - MATH 2004 · Multivariable Calculus for Engineering or Physics (Fall 2016, Fall 2015, Winter 2014)
  - MATH 2107 · Linear Algebra II (Winter 2016)
  - MATH 1104 · Linear Algebra for Engineers and Scientists (Fall 2013)

### Fraunhofer IIS (Institute for Integrated Circuits)

Erlangen, Bavaria, Germany

MUSIC/AUDIO PROCESSING RESEARCH ASSISTANT

May 2016 – August 2016

- Contributed to an open source library (mir\_eval) used by music/audio researchers through adding new evaluation metrics and improving performance resulting in greater accessibility to high quality audio separation evaluation
- Investigated methods for improving performance of math-intensive python code, including code refactoring and GPU optimization

### GasTOPS, Ltd.

Ottawa, Ontario, Canada

ELECTRONICS PRODUCT DESIGN INTERN

May 2014 – August 2015

- Developed automated tests in Python for verifying correct firmware operation of a multiprocessor (Microchip dsPIC33) system
- Tested Modbus RTU and CAN bus 2.0B communication protocols using Python scripts
- Replaced aging spectrum analyzers with a Windows application written in C# that controlled a function generator and oscilloscope using the VISA interface
- Specified and executed hardware testing to evaluate the reliability of critical components
- Developed a Monte Carlo simulation in Mathematica for design optimization resulting in a streamlined manufacturing process
- Executed test specifications requiring the use of DAQ devices, a thermal control chamber, a thermal shock chamber, a shaker table and automated signal injection devices

### Virtual Ventures

Ottawa, Ontario, Canada

WEEKEND CAMP INSTRUCTOR

Jan. 2014 – Feb. 2014

- Educated future scientists and engineers in grades 7-10 on the topic of electronics and programming using the Arduino open source microcontroller system resulting in increased excitement to pursue studies in STEM fields

### Department of Electronics - Carleton University

Ottawa, Ontario, Canada

ELECTRONICS RESEARCH ASSISTANT

May 2013 – August 2013

- Assisted in the ongoing design, assembly and testing of an Atmel microcontroller (ATmega1284p) system resulting in a new revision of the PCBs
- Modified PCB designs in gEDA to add new component sensors (e.g. BMP180, MPU6050) allowing for the device to be used in a wider range of applications including by other students in their capstone project
- Developed post-processing software using Python to provide meaningful data visualizations

# Applied Projects

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## Carleton University

Ottawa, Ontario, Canada

### CAPSTONE TEAM PROJECT - FIRST-IN RISK EVALUATION (F.I.R.E.) SYSTEM

Sept. 2016 - Present

- Designed UAV (quadcopter) system for data collection targeting fire response application
- Interfaced high level application with open source UAV control software (Arducopter) and sensors (e.g. camera, thermal imaging) using ROS on an embedded Linux platform (Raspberry Pi)
- Researched and experimented with photogrammetry (3D model generation from images)

## Carleton University

Ottawa, Ontario, Canada

### CARLETON CANSAT TEAM (RAVEN KNIGHTS)

Jan. 2015 - June 2016

- Developed real time software in C for an NXP Kinetis (KL16Z128; ARM Cortex-M0+ core) device
- Secured 2nd place out of 60 international teams in 2016 and 3rd place out of 42 teams in 2015
- Led software development team in 2015 and electrical team in 2016 for mock satellite competitions
- Used Git version control system to maintain team coherence
- Implemented software performing the following functions:
  - Gathered and transmitted sensor data to a remote ground station
  - Tracked flight state and modified mode of descent based on state
  - Recovered state and calibration from momentary power loss
  - Used PID feedback control to maintain constant orientation during descent

# Volunteering

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## IEEE (Institute of Electrical and Electronics Engineers)

Ottawa, Ontario, Canada

### IEEE - CARLETON CHAPTER

Sept. 2012 - Present

- Held the positions of Secretary, Office Director and Workshop Director for the Carleton chapter of IEEE
- Increased visibility of IEEE in the Ottawa engineering community through outreach events and regular workshops
- Led and took minutes for IEEE Carleton executive meetings leading to increased meeting efficiency
- Provided academic support services to students in electronics, systems and software courses

# Skills

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<b>General Computers</b>	Linux, Windows, Embedded Linux, Microsoft Office Suite including VBA in Excel
<b>Programming Languages &amp; Tools</b>	Python, Git, C/C++, ROS, C#, LaTeX, Bash, Verilog, MATLAB/Simulink, Mathematica, Java, VBA
<b>Communication Protocols</b>	I2C, SPI, UART, CAN bus 2.0B, Modbus RTU (over RS485), Ethernet, TCP/IP
<b>Test Instruments</b>	Oscilloscope, Logic Analyzer, Function Generator, Spectrum Analyzer
<b>Design &amp; Simulation Software</b>	Codewarrior IDE, Visual Studio, EagleCAD, Keil (µVision IDE), Simulink, gEDA, OrCAD, Inkscape