Erik C.M. **Johnson**

Engineer in Training · Electronics, Computation and Systems

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Objective

Embedded software is at the heart of the current revolution in IoT devices and will be key for the future of intelligent robotic systems. Robust and reliable software design is critical for providing customers with dependable products. My objective is to secure employment that allows me to expand my embedded software design and testing skills through exciting problems affecting physical systems.

Education

Carleton University
Ottawa, Ontario, Canada

B.Eng in Electrical Engineering (Minor in Mathematics)
Sept. 2012 - Aug. 2017

- Graduation CGPA of 11.83 / 12 (A+) or GPA of 3.98 / 4
- Five co-op work terms completed (total of 20 months)
- Chipworks/Rebekah Proud Memorial Award
- W. R. Davis Engineering Scholarship
- Faculty of Engineering Scholar award
- Carleton Academic Scholarship
- Dean's Honour list 2012-2014, 2016-2017

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

Capstone Engineering Project - First-In Risk Evaluation (F.I.R.E.) System   *Ottawa, Ontario, Canada*

CARLETON UNIVERSITY   *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 CanSat Team (Raven Knights)   *Ottawa, Ontario, Canada*

CARLETON UNIVERSITY   *Jan. 2015 - June 2016*

- Led software development team in 2015 and electrical team in 2016 for mock satellite competition
- Developed real time embedded software in C for an NXP Kinetis (KL16Z; ARM Cortex-M0+ core) device
- Secured 2nd place out of 60 international teams in 2016 and 3rd place out of 42 teams in 2015
- 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

Freescale Cup 2014 (now NXP Cup)   *Ottawa, Ontario, Canada*

CARLETON UNIVERSITY   *Oct. 2013 - April 2014*

- Developed real time embedded software in C for an NXP Kinetis (KL25Z; ARM Cortex-M0+) device
- Implemented a driver for servo steering control allowing for easy algorithm implementation
- Collaborated on the design of an efficient vision and motion planning algorithm

Volunteering

IEEE - Carleton Student Branch   *Ottawa, Ontario, Canada*

CARLETON UNIVERSITY   *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

General Computers	Linux, Windows, Embedded Linux, Microsoft Office Suite
Programming Languages & Tools	Python, C/C++, ROS, C#, git, LaTeX, Verilog, MATLAB, Java
Communication Protocols	I2C, SPI, UART, CAN bus 2.0B, Modbus RTU (over RS485), Ethernet, TCP/IP
Test Instruments	Oscilloscope, Function Generator, Logic Analyzer, Spectrum Analyzer
Design & Simulation Software	Eclipse-based IDEs, Visual Studio, Unity, EagleCAD, MATLAB/Simulink, OrCAD