

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, reliable, and verifiable 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.

Work Experience

QNX Software Systems

Ottawa, Ontario, Canada

SYSTEM SOFTWARE DEVELOPER

May 2017 - Present

- Developed software in C/C++ for camera and sensor middleware targeting the ADAS (Advanced Driver Assistance System) market
- Optimized memcpy performance on Intel platforms using assembly to achieve a 100% performance improvement
- Implemented a cache management solution to allow the use of cached memory on ARM platforms that previously had cached memory disabled which resulted in significant memory performance on all ARM platforms
- Utilized object oriented software design to implement new features with consideration to flexibility and maintainability

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

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

Education

Carleton University

Ottawa, Ontario, Canada

B.ENG IN ELECTRICAL ENGINEERING (MINOR IN MATHEMATICS)

Sept. 2012 - April 2017

- Graduation CGPA of 11.83 / 12 (A+) or GPA of 3.98 / 4
- Five co-op work terms completed (total of 20 months)

Applied Projects

Zebra Dodge (Mobile Game)

CLOSECALL STUDIOS

- Utilized the Unity game engine to develop a mobile game in partnership with an artistic director

Ottawa, Ontario, Canada

Aug. 2017 - Present

Capstone Engineering Project - First-In Risk Evaluation (F.I.R.E.) System

CARLETON UNIVERSITY

- 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)

Ottawa, Ontario, Canada

Sept. 2016 - April 2017

Carleton CanSat Team (Raven Knights)

CARLETON UNIVERSITY

- 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 70 international teams in 2016 and 3rd place out of 60 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

Ottawa, Ontario, Canada

Jan. 2015 - June 2016

Volunteering

IEEE - Carleton Student Branch

CARLETON UNIVERSITY

- 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

Ottawa, Ontario, Canada

Sept. 2012 - April 2017

Skills

General Computers	Linux, Windows, QNX, Embedded Linux, Microcontrollers, Microsoft Office Suite
Programming Languages & Tools	Python, C/C++, C#, ROS, git, \LaTeX , assembly, Subversion, MATLAB
Design & Simulation Software	Unity (Game Engine), Eclipse-based IDEs, Visual Studio, EagleCAD, MATLAB/Simulink
Test Instruments	Oscilloscope, Function Generator, Logic Analyzer, Spectrum Analyzer