

# JENNA GODWIN

Undergraduate Candidate – BAsC. Electrical Engineering 3A  
Hardware Hacker & Embedded System Enthusiast  
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## ENGINEERING SKILL SUMMARY

- **Programming:** Python, C, C#, Java, Git, VHDL, HTML, Javascript, CSS, Assembly
- **Design Tools:** Altium Designer, Eagle Cadsoft, GitHub, MATLAB, Eclipse, Multisim, Quartus II, µVision Keil, MS Office
- **Electrical:** Lab Tools (Oscilloscope, DMM, Advanced Soldering), *Concepts:* Inverter Drives, PMSM & BLDC Motors, DC & Servo Motors, Relays
- **Hardware/Firmware:** Arduino, Raspberry Pi, AVRdude, Firmware Flashing via Arduino ISP, FPGA (Spartan 6), Microprocessors (ARM, 8051), Microcontroller (Cypress, Xilinx), Image Sensors, USB, High-Speed Transfers 8/16/32 bit, Serial Communications (I2C, SPI, UART), Motor Inverter Drive Design
- **Personal Skills:** Quick learner, Work with minimal supervision, Team player

## ENGINEERING WORK EXPERIENCE

### ***Embedded Hardware & Software Developer***

Sept – Dec 2015

Ecologix Heating Technologies, Cambridge, Ontario

- Motor Control – Inverter Drive Research & Analysis
  - Motor Efficiency of BLDC/PMSM Motors
  - Motor Control Methods: Trapezoidal/Sinusoidal/Field Oriented BEMF Control
  - Motor Controllers: Cypress PSoC 2, Zilog Z16FMCU
  - AC Power Rectification & Smoothing, Processor Control, Power Transistor Network for Energizing Motor Windings
- Re-designed circuit schematic – joining board between old and new infrastructure - incorporate LED indicator system for voltage levels, implemented diode protection
- Analysed competitor products - 8 Pole BLDC motor control fan unit
- Modified existing circuit boards for internal development & research purposes

### ***Electrical Engineering Intern***

Jan – May 2015

NCR Canada LTD, Waterloo, Ontario

- Prototype PCB: Lab rework and verification
- Troubleshooting & Repair: advanced soldering, oscilloscope, power supply, DMM
- Thermal & EMC testing
- Schematic and PCB layout review with EDA software (Altium Designer)
- Micro-controller replacement research – high speed/data throughput over USB, serial
- Interfaces (I2C, SPI, UART), ARM M-Series Cores
- Python Testing Scripts

- FGPA (Xilinx Spartan) Register Polling
- Regression Testing (Test Suits) of simulation Camera Image Capture
- Created Custom Solenoid Motor Controller with DPDT switching & Repaired Cable Harnesses

### ***Application Developer***

May – Aug 2014

Communitech, Kitchener, Ontario

- Remote control blimp controlled with Raspberry Pi over Web
- Gyroscope data sent over Node.js Server to communicate with board DC/Servo Motors
- Virtual Joystick interface for user control of Thrust, Pitch, YAW
- Open Web-Interface with Limited Control of Instances (Version Control) • iOS Client Interface App - Insurance App.
- Wrapped in PhoneGap and Dojo Mobile (Javascript)
- Custom API Authentication & Data Population into Various Content Panes

## **EDUCATION**

*Electrical Engineering, Honours Bachelor of Applied Science (BASc)*

University of Waterloo, Waterloo, ON

Sept 2013 – Present

Relevant Courses:

- ECE 240: Electronic Devices – circuit design and calculations
- ECE 380: Analog Control Systems – design, modelling, optimization of controllers
- ECE 375: Electromagnetic Fields and Waves – transmission line calculations

## **ENGINEERING PROJECTS**

- Ultrasonic bark control device for pets – Fast Fourier Transform
- Modified computer power supply – transformed into benchtop experiment power supply
- Ontario Engineering Competition – Designed Controls for Robot Test Setup: Ultrasonic position sensor motor control, Piezoelectric sensors, LCD Screen
- Arduino tutorials online – shift registers, motor controllers, amplifier, 555 timer, etc.

## **ACTIVITIES AND INTERESTS**

- Languages & Culture: English, French, Croatian, English & Scottish History, Classical Violin & Piano, Magic & Astrology
- Muay Thai Boxing, Cross Country Running, TV & Movie Marathons, Interior Decorating, Baking & Cooking