# SEBASTIEN BLANCHET

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## SKILLS

- Advanced embedded control system design acquired from project and hands-on laboratory experiences
- Exceptional critical thinking and problem-solving skills allowing for complex engineering analysis
- Highly motivated and organized self-starter with a strong attention to detail and work ethic
- Outstanding oral and written communication to share creative ideas fluently in both English and French
- Able to thrive and lead in a team or work independently in a dynamic deadline driven environment
- Proficient in iWork, SOLIDWORKS, MATLAB/Simulink, Python, C++, C, LabVIEW, LaTeX, Bash
- Experience with PLC/SCADA/HMI systems, embedded microcontroller programming (TI, Raspberry Pi, Arduino, x86 Assembler), Xilinx FPGA, Linux, ECAD tools, ANSYS FEA and CFD

## EDUCATION

**University of Waterloo** — **Waterloo, ON, CAN**
Candidate for B.ASc. *3.3/4.0 GPA* — *Sept. 2013 - Present*
Honours Mechanical Engineering Co-op Program

## EXPERIENCE

**Apple Inc.** — **Cupertino, CA, USA**
*Controls Engineering: Special Projects Group (SPG)* — *Aug. 2017 - Present*

- Developed a HIL system to validate power electronic control algorithms for autonomous technologies
- Designed system harness to interface HIL with PCBA from schematics and hardware specifications
- Programmed LabVIEW HMI for communication of PXIe RTOS controller and FPGA models and circuit solver **final deployment**
- Implementation of MATLAB/Simulink models firmware in C on embedded MCU, DSP with discrete implementatio of second order filters
- Converted continious MATLAB/Simulink models to discrete time for FPGA
- Control system plant model emulation on NI cRIO Linux controller and x32 FPGA
- Assured robustness of control architecture with verification of safety-critical diagnostics algorithms
- Automated regression testing with Python and LabVIEW
- Hardware communication protocols serial, ethernet, SPI PCIe, I2C, UART
- Debug and bring-up of high voltage PCBAs with JTAG, ethernet, serial, safely with in-house test racks, electronic lab equipment and NI instrumentation, **realiability**
- Employed Agile software development with Atlassian tools (JIRA, Confluence, Sourcetree) to track firmware bugs and fixes

**Altaeros Energies** — **Boston, MA, USA**
*Systems Engineering* — *Jan. - Apr. 2017*

- Performed FEA in ANSYS and PYTHON on prototype of worlds first commercial autonomous aerostat
- Coordinated with vendors and ControlEng SERVOsoft to size all control system components (servos, VFDs)
- Utilized electronic lab equipment, sensors and LabVIEW HMI to gather test data and analyze with MATLAB **electromechanical**

**Ontario Die International Inc.** — **Kitchener, ON, CAN**
*Research & Development* — *May - Aug. 2016*

- Designed robotic components (electrical, hydraulic) of PLC/CNC bending systems in SOLIDWORKS
- Automated tedious SOLIDWORKS tasks in VBA and C++ with the API in MS Visual Studio IDE
- Performed hands-on Q&A HMI testing, machined components, fabricated assemblies with power/hand tools

**Pratt & Whitney Canada** — **Mississauga, ON, CAN**
*Operations Program Management Analyst* — *Sept. - Dec. 2015*

- Assured on time OEM delivery of a quality turbofan engine while meeting their expectations and needs
- Developed Excel VBA programs allowing for improvements in methods of business metric preparation

**Skyjack Inc.** — **Guelph, ON, CAN**
*Manufacturing Engineering* — *Jan. - Apr. 2015*

- Worked with a team of engineers to troubleshoot production issues at an aerial work platform manufacturer

## PROJECTS

**Ball & Beam Lab** — *ECE481: Digital Control Systems* — *Aug 2017*

- Designed LabVIEW HMI, performed system ID, implemented/tuned digital controller on NI cRIO FPGA

**Drum Rhythm Arduino Hack** — *Personal: WIT Hackathon* — *Mar. 2017*

- Coded firmware in C and communicated over UART to MATLAB for real-time monitoring of drumming vibration

**Wind Turbine Pitch Actuator** — *ME360: Control Systems* — *Dec. 2016*

- Studied time/frequency domain responses in MATLAB for closed loop stability of PI controlled Simulink

**Mining Safety Device** — *ME380: Engineering Design* — *Nov. 2016*

- Developed a 3D printed enclosure to protect internal Arduino and sensors of severe underground environment

**DC Motor Control System** — *ME360: Control Systems* — *Oct. 2016*

- Designed real-time PID control in simulation with Simulink for DC motor; implemented with QUARC C code generation

**CNC Bending Powertrain** — *WKRPT 300: Co-op 4* — *Sept. 2016*

- Performed iterative testing with HMI to gather data for selection; assured compatibility into control system

**Dune-Buggy Repairs** — *Personal* — *Aug. 2016*

- Diagnosted fuel system ignition issue then replaced carburetor, **coils and armature**

**INTERESTS**

- Further developing skills while gaining new exposure to firmware, real-time controls and electronics
- Repairing off-road vehicles, DIY Arduino projects, hockey, golf, swimming and socializing with friends