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 C control algorithms for autonomous technologies
- Converted MATLAB/Simulink continuous time algorithms to discrete firmware in C
- Emulated and optimized **pipelining** plant models on 32-bit Xilinx FPGA for high fidelity, low latency μs control
- Applied DSP theory with discrete filters in C for data acquistion (LPF, HPF, BSF, BPF, anti-alias)
- Deployed LabVIEW HMI for communication between PC, PXIe RTOS controller and FPGA models
- Debuged high voltage PCBAs with in-house test racks, electronic lab equipment and NI instrumentation
- Assured robustness and realiability of safety-critical diagnostics by virtual faul injection at HIL
- Flashed to perform MCU bring up via JTAG, serial and ethernet interfaces to validate latest build of SW releasesn
- Hardware communication protocols interfaces serial, ethernet, SPI PCIe, I2C, UART, JTAG **physical port interface of OSI software layering**
- Employed Agile software development with Atlassian tools and Git 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 an autonomous aerostat's electromechanical system
- Coordinated with vendors and ControlEng SERVOsoft to size all control system components (servos, VFDs)
- Utilized electronic lab equipment and LabVIEW HMI to log test data and analyze with MATLAB

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 — *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 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 PID control in Simulink simulation for a DC motor; implemented in real-time 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 Magneto Repair *Personal* *Aug. 2016*

- Diagnosted fuel system ignition issue then replaced coil and armature of solid-state system

INTERESTS

- Further developing skills and gaining new exposure to firmware, real-time controls, electronics and machine learning and artificial intelligence

- Repairing off-road vehicles, DIY electronics, hockey, golf, swimming and socializing with friends