SEBASTIEN BLANCHET

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SKILLS

- **Programming:** Embedded C, C++, Python, MATLAB, Swift, Java, Javascript
- **Hardware:** MCU (ARM, Texas Instrument, Arduino, Raspberry Pi), FPGA (VHDL, Xilinx Vivado)
- **Simulation:** LabVIEW FPGA/RT, Simulink, OPAL-RT, Speedgoat, dSPACE, SOLIDWORKS, ANSYS
- **OS:** Windows, macOS, Linux, RTOS (FreeRTOS, Phar Lap ETS, TI-RTOS, QNX), UNIX
- **Protocols:** CAN, LIN, UDS, SPI, I2C, JTAG, UART, USB, RS422, Ethernet, FTP, PCIe
- **Integration:** Git Bash, Atlassian (JIRA, Confluence, Stash) GitHub, Jenkins, YAML, SCons, Maven
- **Concepts:** embedded discrete controls, DSP, HIL/SIL, TDD, SCRUM, OOP, DSA, CI, API, SoC, ASIC
- **Other:** Bash, Vim, HTML5, CSS, JSON, XML, LaTeX, Markdown, MISRA, Assembly

EDUCATION

University of Waterloo — **Waterloo, ON, CAN**
Candidate for B.ASc. *GPA: 3.5/4.0* — *Sept. 2013 - Apr. 2019*
Honors Mechanical/Mechatronics Engineering Co-op

EXPERIENCE

Tesla — **Palo Alto, CA, USA**
Firmware Engineering - Energy Products — *Sept. - Dec. 2018*
- Coding MISRA compliant firmware in C for power electronic controls on embedded system's DSPs and MCUs
- Full-stack exposure: RTOS kernel, serial drivers (UDS, CAN, SPI), application level controls and diagnostics
- Deploying embedded self-test C framework multiple ECUs to eliminate manual debugging at EOL/field
- Improving existing Java code generations tools and Python Pytest regression testing
- Assuring CI with Atlassian tools, Git Bash, code review, Jenkins builds, unit tests, SIL, HIL

Apple — **Cupertino, CA, USA**
Controls Engineering - Special Projects Group — *Aug. 2017 - Aug. 2018*
- Developed a hardware-in-the-loop system for validation of power electronic control algorithms in C
- Emulated and optimized high-fidelity discrete plant models on 32-bit Xilinx FPGA for low latency μs control
- Deployed LabVIEW HMI for deterministic communication between PC, PXIe RTOS controller and FPGA
- Flashed microcontroller via JTAG, serial and Ethernet with the latest software builds for bring-up of PCBAs
- Applied DSP theory to convert continuous Simulink filters to discrete firmware in C for data acquisition
- Implemented automated testing Python frameworks for continuous integration and software regression

Altaeros — **Boston, MA, USA**
Systems Engineering - Research & Development — *Jan. - Apr. 2017*
- Performed numerical analysis in Python on prototype of an autonomous aerostat's electromechanical system
- Utilized electronic lab equipment and LabVIEW HMI to log test data and analyze with MATLAB

Ontario Die International — **Waterloo, ON, CAN**
Mechanical Design - Research & Development — *May - Aug. 2016*
- Designed robotic components (electrical, hydraulic) of PLC/CNC bending systems in SOLIDWORKS

Pratt & Whitney Canada — **Mississauga, ON, CAN**
Program Management - Turbofan Operations — *Sept. - Dec. 2015*
- Assured on time OEM delivery of a quality turbofan engine while meeting their expectations and needs

Linamar — **Guelph, ON, CAN**
Manufacturing Engineering - Skyjack — *Jan. - Apr. 2015*
- Worked with a team of engineers to troubleshoot production issues at an aerial work platform manufacturer

PROJECTS

Web Portfolio Development — *Personal* — *Ongoing*
- Hosting personal website to showcase portfolio via GitHub utilizing knowledge of front-end coding

Swift App Training — *Apple: Software University* — *Aug. 2018*
- Reviewed the fundamentals of object oriented programming in Swift and coded basic application

MIT Open Courseware Self-Study — *6.006 Introduction to Algorithms* — *May 2018*
- Covered complexity, sorting algorithms, graphs, and dynamic programming in Jupyter Python notebooks

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

DC Motor Control System — *ME360: Control Systems* — *Oct. 2016*
- Designed PID control in Simulink for a DC motor; implemented in real-time with QUARC C code generation

Dune-Buggy Magneto Repair — *Personal* — *Aug. 2016*
- Diagnosed fuel system ignition issue then replaced coil and armature of solid-state system

INTERESTS

- Further developing skills related to firmware, electronics, machine learning and embedded systems
- Repairing off-road vehicles, DIY electronics, hockey, golf, swimming and socializing (bilingual/French)