

EDUCATION

MCGILL UNIVERSITY

PHD IN MECHANICAL ENGINEERING

Apr 2021 | Montreal, QC

Cum. GPA: 4.00

MCGILL UNIVERSITY

BENG, MECHANICAL ENG (HONOURS)

Dec 2015 | Montreal, QC

Dean's Honour List (All Semesters)

Cum. GPA: 3.93

NEWTON SOUTH HIGH SCHOOL

June 2011 | Newton, MA

Honor Roll (All Semesters)

SKILLS

Experienced:

Matlab • Simulink • C++ • Ignition
Perspective • ROS • Gazebo • \LaTeX •
Linux • Microsoft Office

Familiar:

Python • Automation Studio • MySQL •
Solidworks • PLCs

AWARDS

Intramural Sports Hall of Fame Inductee

MEDA Scholarship

British Association Medal

MEUSMA Scholarship

Ralph & Ruth Collins Scholarship

SURE Award

James & Daisy Mathison Scholarship

Richard Laurence Weldon Scholarship

AP Scholar Award

SELECTED PUBLICATIONS

E. Bulka and M. Nahon, "Autonomous Fixed-Wing Aerobatics: From Theory to Flight", International Conference on Robotics and Automation (ICRA), May 2018.

E. Bulka and M. Nahon, "A Universal Controller for Unmanned Aerial Vehicles", International Conference on Intelligent Robots and Systems (IROS), Oct 2018.

E. Bulka and M. Nahon. "Automatic Control for Aerobatic Maneuvering of Agile Fixed-Wing UAVs", Journal of Intelligent & Robotic Systems, 2019.

E. Bulka and M. Nahon, "A Unified Control Strategy for Autonomous Aerial Vehicles", Autonomous Robots, 2021.

E. Bulka and M. Nahon, "Reactive Obstacle-Avoidance for Agile Fixed-Wing Unmanned Aerial Vehicles," Field Robotics, 2022.

INDUSTRY EXPERIENCE

BOSTON METAL | MODEL-BASED CONTROLS ENGINEERING MANAGER

Jan 2025 – Present | Remote

Oversee all process control software development and deployment including: PLC software originating from MATLAB/Simulink that contains supervisory logic, feedback control systems, state estimators, and fault detection. Human-Machine-Interface (HMI) using Ignition Perspective. Data analysis tools using Ignition and Python. Prioritize tasks and ensure deadlines are met. Train new hires and mentor teammates.

BOSTON METAL | MODEL-BASED CONTROLS ENGINEERING TEAM LEAD

June 2024 – Jan 2025 | Remote

Grew team from 3 to 6 members doing same duties as above.

BOSTON METAL | MODEL-BASED CONTROLS ENGINEER

Aug 2021 – June 2024 | Remote

Develop supervisory logic, feedback control systems, state estimators, and fault detection using MATLAB/Simulink for Molten Oxide Electrolysis process control. Use Mathworks code generation tools to deploy code to B&R PLC. Develop Human-Machine-Interface (HMI) using Ignition Perspective. Conduct testing of algorithms using model-in-the-loop (MiL), target-in-the-loop (TiL), and live commissioning.

ROBOTICS AND AUTOMATION CONSULTANT | CONTRACT

April 2019 – July 2021 | Remote

Software consulting services for control systems, motion planning, and PX4 programming (UAVs). Former Clients: Continental Control and Designs (Huntington Beach, California), Vayu (Ann Arbor, MI), and Notos Technologies (Montreal, QC)

ALTAEROS ENERGIES | INSTRUMENTATION INTERN

Sept 2017 – Oct 2017 | Somerville, MA

Configured and tested a differential GPS unit used on a tethered aerostat.

MCGILL UNIVERSITY | TEACHING ASSISTANT

Sept 2014 – Apr 2021 | Montreal, QC

Taught weekly tutorials for the following courses: Dynamics (6x), PDE's and Linear Algebra (3x), and System Dynamics and Control (1x).

RANGER AUTOMATION | ENGINEERING INTERN

June 2013 – Aug 2013 | Shrewsbury, MA

Created exploded views (CAD) of robots to assist the assembly line workers.

ACADEMIC RESEARCH

AEROSPACE MECHATRONICS LAB | RESEARCH ASSISTANT

Jan 2021 – Aug 2021 | Montreal, QC

Developed a control strategy for collaborative payload transport with multiple drones. The solution was implemented in software-in-the-loop simulation and in outdoor flight testing.

AEROSPACE MECHATRONICS LAB | GRADUATE RESEARCHER

Jan 2016 – Apr 2021 | Montreal, QC

Developed control and collision avoidance strategies for agile fixed-wing unmanned aerial vehicles. The algorithms were validated in simulations, hardware-in-the-loop simulations, and both indoor and outdoor flight tests.

AEROSPACE MECHATRONICS LAB | UNDERGRADUATE RESEARCHER

Jan 2014 – Dec 2015 | Montreal, QC

Developed a model which predicts the effect of wind on a quadrotor and developed a pressure based wind sensor for measuring air flow on-board a quadrotor.