Bennett Newhook

Bachelor's in Engineering (B.Eng), Mechanical
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EDUCATION

- **Master's of Engineering, Mechanical (M.Eng), 4.0GPA** **(Sept 2020 - Present)**
  Memorial University of Newfoundland St. John's, NL
  - Selected Coursework: Engineering Analysis, Machine Learning (ML), Generative Adversarial Networks (GANs), Advanced Topics in Computer Vision, Aided Navigation Systems
- **Bachelor's of Mechanical Engineering (B.Eng) Co-op Program, 3.5GPA (Sept 2015 - Apr 2020)**
  Memorial University of Newfoundland St. John's, NL
  - Specialization in mechatronics; focus in robotics & control systems.

PROFESSIONAL EXPERIENCE

- **Executive Director** **(Nov 2017 - Present)**
  Greenspace Urban Farms St. John's, NL
  - Remotely managed team during the custom design of hydroponics and Internet of Things (IoT) sensor systems.
  - Pending publishing of academic study and book chapter on the economics and technology of hydroponic farms.
- **Stagiaire en Fabrication** **(Sept 2019 - Jan 2020)**
  La Compagnie Électrique Lion Saint-Jérôme, QC
  - Designed and tested prototype vehicles in an entirely Francophone workplace and assembly line.
  - Authored technical documentation for manufacturing and maintenance of electric vehicles in English and French.
  - Built simulation tools for prototype vehicles in Python to meet Canadian motor vehicle test standards.
- **Junior Project Manager** **(Jan - Apr 2017, Sept - Dec 2018)**
  NL Hydro Churchill Falls, Labrador
  - Oversaw hydroelectric maintenance projects over $100k$ involving multiple teams.
  - Designed experiments and procured hardware for testing of control systems.
  - Collaboration with remotely working teams of international contractors to test, maintain and overhaul combustion turbines.

THESIS

- **Master's of Engineering, Mechanical (M.Eng), 4.0GPA** **(Sept 2020 - Present)**
  Memorial University of Newfoundland St. John's, NL
  - Received award of Future Builder: NRC AI for Logistics Program for outstanding efforts on multi-sensor odmetry with deep learning-based map building and mode adaptation for vertical take-off and landing (VTOL) vehicles

- Designed, procured, and tested components of an autonomous drone/helicopter payload, with regular technical reports to the Canadian National Research Council (NRC)
- Performed image processing on proprietary datasets for computer vision tasks, embedded on NVIDIA Jetson Xavier.
- Benchmarked Generative Adversarial Networks (GANs) for aerial semantic segmentation against the state-of-the-art using ensorFlow, Keras and PyTorch.

RESEARCH EXPERIENCE

- **Satellite Attitude Determination & Control System (ADCS) (May 2019 - Sept 2020)**
  Killick-1 CubeSat St. John's, NL
  - Designed and fabricated satellite Guidance, Navigation and Control (GNC) system.
  - Designed alongside six multidisciplinary teams to meet the standards of the Canadian Space Agency (CSA).
  - Modeled and simulated satellite body dynamics and navigation system in MATLAB Simulink.
- **Teaching Assistant (TA) Positions (Jan - Oct 2021)**
  Memorial University of Newfoundland St. John's, NL
  - **Instrumentation & Experimental Design**: Developed projects for sensor modeling and simulation in LabView, sensor calibration, data acquisition, and analysis.
  - **Solar Engineering**: Produced prototype designs for Variable Frequency Drive (VFD) electric bicycle, and solar-powered refrigerator with alternative propane refrigerant.
- **Master's Course Projects (Jan - Aug 2021)**
  Memorial University of Newfoundland St. John's, NL
  - **Aided Navigation Systems**: Designed Inertial Navigation System (INS), Attitude Heading Reference System (AHRS), and mobile target tracker in MATLAB using error state and linearized Kalman filter.
  - **Advanced Topics in Computer Vision**: Trained and benchmarked state-of-the-art Object Detection and Tracking (OD&T) systems on aerial datasets using MATLAB, Python, C++, and OpenCV.

PUBLICATIONS

- **Conference Proceedings**
  - Newhook, Bennett (2021). "Federally-Legislated Obstacles of Remotely Piloted Aircraft in Object Detection & Tracking Benchmarks". In: Proceedings of IEEE NECEC 2021 (Nov. 18, 2021). St. John's, NL.

VOLUNTEERING

- **Head Referee (2015 - Present)**
  Canadian Improv Games: NL Tournament
  - Mentorship, logistics, and coaching for Canada's largest theatre festival.
- **Advocacy & Corporate Sponsorship Lead (2016 - 2020)**
  Engineers Without Borders MUN

- Lobbied Canadian Ministers of Parliament (MPs) for data-driven foreign business investment using Canada's $7.5 billion in foreign aid.

- **Council Member** **(2017 - 2019)**
  Premier's Youth Council of Newfoundland & Labrador
  - Represented engineering students and young entrepreneurs in policy consultations with the Premier of Newfoundland and Labrador.

SKILLS

- **Technical**
  Python MATLAB & Simulink, Linux, UNIX/Bash, ROS, CUDA, PyTorch, TensorFlow, Keras, Google, Colab, LabView, NVIDIA, Jetson Xavier, DoE, Arduino, Technical Writing, LaTeX, Certified SolidWorks Associate, Microsoft Office Suite, Microsoft Excel, Drone Pilot Certification (Basic Operations)

- **Soft**
  Independent Problem Solving, Systems Thinking Adaptability, Public Speaking Collaborative Design, Creative Thinking Organization, Funding Proposal Authorship

AWARDS

- **Hacking Mt. Pearl Hackathon** **(Oct 2020)**
  First Place

- **Social Innovation Challenge** **(May 2018)**
  First Place

- **Feeding 9 Billion Challenge** **(Nov 2017)**
  First Place

LANGUAGES

- **English**
  Bilingual Proficiency

- **French**
  Full Professional Proficiency

REFERENCES

- **Dr. Carlos Bazan**
  Memorial University of Newfoundland. carlos.bazan@mun.ca
  +1 (709) 864-3437

- **Hannah Gaultois**
  Public Services & Procurement Canada Hannah.Gaultois@pwgsc-tpsgc.gc.ca