Bennett Newhook

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

Master's of Engineering, Mechanical (M.Eng) **(Sept 2020 - Present)**
Memorial University of Newfoundland St. John's, NL

- GPA: 4.0/4.0
- 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 **(Sept 2015 - Apr 2020)**
Memorial University of Newfoundland St. John's, NL

- GPA: 3.5/4.0
- Specialization in mechatronics; focus in robotics & control systems.

THESIS

Master's of Engineering (M.Eng), Mechanical **(Sept 2020 - Present)**
Memorial University of Newfoundland St. John's, NL

- Developed a novel adversarial unsupervised domain adaptation model for semantic segmentation, leveraging the latest advances in computer vision. Conducted rigorous benchmarking experiments to evaluate its performance against state-of-the-art approaches, demonstrating superior results.
- Designed, procured, and tested components of an autonomous drone/helicopter payload, with regular technical reports to the Canadian National Research Council (NRC).
- Embedded state-of-the-art object detection and tracking networks (trained with proprietary data) onboard an NVIDIA Jetson Xavier, utilizing expertise in computer vision and hardware integration.

PROFESSIONAL EXPERIENCE

Executive Director **(Nov 2017 - Present)**
Greenspace Urban Farms St. John's, NL

- Managed a remote engineering team in designing control systems for monitoring, yield prediction, and automation of hydroponic farms.
- Collaborated with researchers to write an academic study and a book chapter on the economics and technology of hydroponic farms (pending publishing).
- Led a research team that developed custom business plans for hydroponic farms aimed at improving access to fresh food in remote areas.

Stagiaire en Fabrication (Fabrication Intern) **(Sept 2019 - Jan 2020)**
La Compagnie Électrique Lion Saint-Jérôme, QC

- Built simulation tools for prototype vehicles in Python and MATLAB to meet Canadian motor vehicle test standards, demonstrating proficiency in programming and data analysis.
- Designed and tested prototype electric vehicles in an entirely Francophone workplace and assembly line, providing a strong foundation for engineering over the product lifecycle.
- Authored technical documentation for manufacturing and maintenance of electric vehicles in English and French, highlighting proficiency in technical writing and bilingual communication.

Junior Project Manager **(Jan - Apr 2017, Sept - Dec 2018)**
NL Hydro Churchill Falls, Labrador

- Coordinated with remote teams of international contractors to design, test, maintain, and overhaul combustion turbines using advanced control system engineering techniques.
- Oversaw hydroelectric maintenance projects over $100k involving multi-disciplinary teams.
- Designed and conducted experiments, procured hardware and software, and analyzed data to optimize the performance of hydroelectric control systems.

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.

RESEARCH EXPERIENCE

Satellite Attitude Determination & Control System (ADCS) **(May 2019 - Sept 2020)**
Killick-1 CubeSat St. John's, NL

– Designed and implemented a Guidance, Navigation and Control (GNC) system for a satellite CubeSat, meeting Canadian Space Agency (CSA) standards.
– Utilized MATLAB Simulink to model and simulate satellite body dynamics and navigation system, demonstrating proficiency in software commonly used in computer vision and machine learning applications.
– Developed multidisciplinary teamwork skills by collaborating with six teams to ensure successful system integration and functionality.

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

– 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.
– 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.

VOLUNTEERING

Head Referee, Canadian Improv Games: NL Tournament **(2015 - 2022)**

– Provided mentorship, coordinated logistics, and coaching to Canada's largest theatre festival.

Advocacy & Corporate Sponsorship Lead, Engineers Without Borders MUN **(2016 - 2020)**

– Met with Canadian Ministers of Parliament (MPs) to campaign for foreign business investment that meets the United Nations' Sustainable Development Goals (SDGs) using Canada's $7.5 billion in foreign aid.

Council Member, Premier's Youth Council of Newfoundland & Labrador **(2017 - 2019)**

– Consulted on key government initiatives by members of the provincial government and directly to the Premier of Newfoundland and Labrador.

SKILLS

Technical: Python, MATLAB & Simulink, Linux, UNIX/Bash, PyTorch, TensorFlow, Keras, Google Colab, LabView, NVIDIA Jetson Xavier, Arduino, Design of Experiments (DOE), Technical Writing, LaTeX, Microsoft Office Suite, Microsoft Excel

Certifications: Certified SolidWorks Associate, Drone Pilot (Basic Operations)

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

AWARDS

National Research Council (NRC) AI for Logistics Program, Future Builder **(Jan 2023)**

– For outstanding efforts on multi-sensor odmetry with deep learning-based map building and mode adaptation for vertical take-off and landing (VTOL) vehicles.

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

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

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

LANGUAGES

English, Bilingual Proficiency

French, Full Professional Proficiency