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Highlight Of Skills & Career Direction

- Developing specialization for industrial automation, with a strong focus on software and controls in the industrial and energy sectors; passionate about sustainable energy systems, including green technologies and efficiency improvements in conventional energy.
- 10 years of experience in industrial operations and research, spanning both large- and small-scale environments, industrial design under engineers, and safety practices (progress reports, SOPs, PPE, P&IDs).
- Background in software and embedded electronics, with fixation on system integration in control systems, including industrial controls (SCADA, PLCs, HMIs, IEC languages), Python-driven SQL database management on Linux servers, JavaScript for web frontends and servers, and C# for Unity 3D simulations.
- Strong project management skills, demonstrated through leadership roles, including Co-Lead of Renewable Energy Design (RED) student club, advancing the club's solar greenhouse automation, and independently developing various personal electronics and SCADA projects.
- Excellent reporting and communication abilities, including engineering technical reports, experience articles on my website, and organizational improvements for the RED club.

Academic Education & Co-op Status

BSc in Computer Engineering (Software option) Co-op — September 2020 – December 2026
University of Alberta, Edmonton AB — 12-months of co-op terms still available

Certificate - Ladder Logic and Advanced PLC Programming — Acquired in October 2024
Northern Alberta Institute of Technology, Edmonton AB — (certificate info)

Certificate - Power Engineering - 3rd Class — Acquired in January 2016
Alberta Boiler Safety Association (ABSA), Edmonton AB — (certificate registry)

Work Experience

Unity 3D Developer – UAlberta AR Application — May 2022 – August 2022
Mechanical Engineering Dept – UAlberta, Edmonton AB
C#, Unity3D game engine, augmented reality, Fusion 360, 3D modeling, Git, Gitlab, scrum / sprints

- Designed and constructed mobile app AR simulations using Unity and Fusion 360, showcasing engineering concepts, including: a Manual Transmission simulation illustrating internal gear interactions, a Wheel Free-Body Diagram visualizing dimensional vectors, and a Solar Cell animation demonstrating layering and electric potential.
- Utilized team skills and tools, with a central Gitlab repository and weekly sprint meetings.
- Enhanced understanding of engineering concepts through creation of designs, and improved team coding by helping solve their problems, like writing a ray tracing script for highlighting model walls.

Researcher / Plant Operator / Lab Technologist — July 2009 – February 2020
Syncrude Canada Ltd, Edmonton AB
SCADA plant operations [control panels / HMI, PLCs, instrumentation, alarms, interlocks], research, chemical lab, chemical safety lead, 3D modeling, SolidWorks

- Led complete operations (start up, shut down, maintenance, and operations) of three oil upgrading pilot plants (Catalyst Test Unit, Mini-Catalyst Test Unit, Mini Ebullated Bed Reactor) which produced test run data that I relayed to upgrading engineers for large plant insights.
- Performed auxiliary duties of being chemical safety contact for my team (including chemical storage and SDS checks) and being a 3D modeler using SolidWorks.
- Improved large plant efficiencies through upgrading research, which represented about $2M efficiency improvement every three years.

Projects (See more on cvprofile.branhoy.com by searching in the featured / project sections)

SCADA, HMI and PLC Build with Embedded Systems — October 2024 – December 2024
OpenPLC PLC, FUXA SCADA, HMI, Function Block, Ladder Diagram, Raspberry Pi, Arduino Nano, Modbus

- Integrated SCADA and PLC systems using FUXA SCADA on Windows and OpenPLC runtimes on Raspberry Pi and Arduino Nano, both equipped with physical sensors and actuators. Designed HMIs, configured Modbus communications, and implemented data logging and alarms for real-time monitoring.
- Enabled hands-on learning of industrial automation systems through multi-device testing and supervisory control demonstrations.

Twitter-like Database on Linux Server September 2023 – December 2023
CMPUT291 Database Management – UAlberta
Python, SQL, MongoDB (No-SQL), Linux
- Executed course projects centered on developing a CLI/terminal-based messenger program, on Linux, integrating SQL and MongoDB databases to manipulate Twitter-like messages.
- Significantly enhanced Python programming skills and acquired proficiency in SQL (SQLite databases) and MongoDB no-SQL databases.

Arduino Garden Box with Data Logger May 2023 – August 2023
Arduino [C/C++ like], various sensors
- Assembled and programmed a functional garden box system with Arduino Uno and sensors.
- Wrote responsive Arduino software to display sensor data on an LCD, log data to an SD card in CSV format, and control actuators.

EXTRA-CURRICULAR CLUB INVOLVEMENT

Renewable Energy Design (RED) – UAlberta Engineering Club, Edmonton AB September 2022 – Present

• **Co-President & Solar Manager - Duties of Club** May 2024 – Present
Project management, writing and communication skills, leadership, administration, stewardship
- Co-led club for about a dozen active members, managing the organization and activities, including: Discord virtual communication space and repository stewardship, member management, announcements and meetings, tours, liaising for faculty, major overhaul of club guides.
- Streamlined club operations by reorganizing resources and guides, enhancing structure and efficiency for easier management.

• **Club Showcasing Website, Built with React Frontend and Quarkly** December 2024 – Present
(redclubualberta.pages.dev)
JavaScript, ReactJS, HTML/CSS, JSON
- Extracted a React based template website frontend from visual builder Quarkly, then refactored it to a more data driven design by having articles generated from JSON text lists.
- Applied fundamental software optimizations, the Don't Repeat Yourself principle, by creating central components and article templates from which to dynamically generate multiple articles from a single JSON file.

• **Home Assistant Component Automation Server for Solar Greenhouse** May 2023 – December 2023
Raspberry Pi, Home Assistant, ESP32, ESP8266, sensors, Python, Cloudflare
- Incorporated greenhouse sensors into ESP devices for wireless communication with a Raspberry Pi host running Home Assistant automation software.
- Enhanced functionality to include sensor dashboards, Python script control, data recording and system backup to Google Drive, and secure tunneling the system through Cloudflare enabling remote access via website.

• **Weather Station Installation on Solar Greenhouse** July 2024 – October 2024
NovaLynx weather station, Home Assistant, Raspberry Pi, serial communications, physical installation
- Scoped and planned location and installation of professional weather equipment at greenhouse, including: sensor locations on roof; sensor structure procurement, cutting, and installation; wiring; system data setting; and manual integration with Home Assistant on our Raspberry Pi through serial wiring and communication coding.
- Strengthened project management and technical skills through my procurement of materials and integration of systems that were not so easy as `plug and play`.

ACHIEVEMENTS & AWARDS

Winner - Alberta Power Industry Consortium Hackathon, Edmonton AB February 18 – 20, 2025
Developed neighborhood modeling software for mapping electrification and green-tech grid load impact.
Winner - Alberta Power Industry Consortium Hackathon, Edmonton AB April 28 – 30, 2023
Developed microgrid management software for trading power with the Alberta grid.

OTHER TECHNICAL SKILLS

Languages: IEC PLC languages (Ladder, FBD, ST, SFC), Java, Rust, C/C++
Design: PLC Editors (Rockwell / Allen-Bradley), ExpressJS, FreeRTOS
Support: VSCode IDE, Git, GitHub (for Project Management, Agile / scrum tools, CI/CD with GitHub Actions), Docker, Microsoft and Google office tools (Word, Excel, PowerPoint)
Equipment: Windows, Linux, Raspberry Pi, Arduino and ESP microcontrollers, 3D printers, electrical tools (multimeter, soldering station, lab bench DC power supply, oscilloscope)