Amrit Virk

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Education

McMaster University — Hamilton, ON
Bachelor of Engineering & Co-Op, Electrical Engineering — *Sept. 2023 – Apr. 2027*

Experience

Engineering Intern — May 2025 – Sept. 2025
Metex Heat Treating Ltd. & Exactatherm Ltd. — *Brampton, ON & Mississauga, ON*

- **Served as Project Lead, directing the full-cycle ERP implementation** of Steelhead Technologies system, overseeing requirements, process mapping, and configuration for aerospace heat-treating operations.
- Migrated **30,000+** legacy customer records and digitized production workflows, ensuring compliance with aerospace manufacturing standards and quality control specifications.
- Engineered and validated all process routes and specifications for all heat treating processes, achieving up to **20% reduction** in dock-to-dock lead time.
- **Increased operational efficiency by 40%** by optimizing cross-departmental workflows, implementing real-time production tracking, and streamlining data capture.
- Conducted company-wide training to ensure user adoption across quality, production, and sales departments.
- Collaborated with all teams to ensure data & reporting accuracy into Steelhead, minimizing downtime and rework.

STEM Instructor — Sept. 2022 – Aug. 2023
City of Brampton — *Brampton, ON*

- Led engaging STEM workshops for classes of 20+ students, delivering hands-on lessons in animation, coding, robotics, and video game design, fostering creativity and problem-solving.
- Developed and implemented adaptive lesson plans tailored to diverse learning styles and accessibility needs, incorporating real-world engineering principles (i.e., sensor integration, basic circuit logic, algorithmic thinking) into lesson content.
- Trained new employees in developing lesson plans and teaching etiquette.
- Highest performance ratings in the center based on parent and student feedback.

Co-Captain & Mechanical Team Lead — May 2018 – May. 2020
KraftWerx Robotics — *Brampton, ON*

- Led the mechanical design team through the full engineering process for a VEX Robotics competition robot.
- Engineered a dual 11W high-speed motor flywheel mechanism with a 35:1 gear ratio for the 2019–2019 VEX Robotics season.
- Designed and optimized an intake system for the 2019–2020 VEX Robotics season. Improved collection by reducing slippage and misalignment via adjustments to the attack angle, speed, and gripper positioning — raising success rate from 20% to 98%.
- Placed 5th in Division at VEX Worlds Competition.

Projects

Spatial Mapping System
Embedded C, I2C, UART, MSP432E401Y, VL53L1X, MATLAB, Assembly

- Engineered a 3D spatial mapping platform utilizing a VL53L1X time-of-flight sensor and stepper motor to execute full 360° scans achieving high-accuracy reconstruction of indoor environments.
- Developed embedded firmware on the MSP432E401Y microcontroller for controlling sensor acquisition, LEDs, and system behavior through digital I/O and polling logic.
- Implemented I2C communication for distance data retrieval and UART protocols for serial transmission to a PC.
- Implemented controls via onboard push buttons for system start/stop, homing, and motor direction, with LED-based feedback to indicate operational states and scan progress.

Snake Game
C/C++, GitHub, VS Code, Object-Oriented Design, Dynamic Memory Allocation

- Developed a terminal-based Snake game in C++, applying object-oriented design (OOD) principles to ensure modular, reusable, and organized code architecture.
- Utilized dynamic memory allocation for heap-based object management, preventing memory leaks and improving runtime efficiency.
- Implemented gameplay mechanics such as collision detection, randomized item spawning, and score tracking.

Technical Skills

- **Languages:** Python, C, C++, HTML, CSS, JavaScript, Java, Verilog, TypeScript, Assembly, MATLAB
- **Frameworks & Tools:** Git/GitHub, SQL, React, VS Code, Arduino IDE, Granta, Autodesk Inventor, MS/Google Suite