

SHAAN WRENCH

T 647-964-3704 | @ shaan.wrench14@gmail.com | in /in/shaan-wrench-sw14 | W Portfolio

EDUCATION

Western University

Bachelor of Engineering Science (BESc) in Mechanical Engineering

With Option in Artificial Intelligence Systems Engineering (Co-op)

London, ON

Sept. 2024 – May 2028

- **Awards:** The Western Scholarship of Distinction (\$3500)
- **Relevant Coursework:** Product Design and Development, Engineering Experimentation, Applied Statistics and Data Analysis for Engineers.

TECHNICAL SKILLS

Mechanical & Design: SolidWorks, Autodesk Inventor, AutoCAD, GD&T, Tolerance Analysis, Reverse Engineering, Design for Manufacturability (DFM)

Manufacturing & Inspection: CNC Milling, CNC Turning (Lathes), Manual Machining, Mastercam (CAM), Dimensional Inspection (CMM, micrometers, calipers), Welding, 3D Printing

Programming & Software: Python, MATLAB, Java, LabVIEW, Git, GitHub, Excel, VS Code

EXPERIENCE

Manufacturing Intern

May 2025 – Aug. 2025, May 2026 – Aug. 2026

Bemco Machine Works LTD.

Mississauga, ON

- Produced dimensioned **CAD models and manufacturing drawings from existing physical components** in **SolidWorks**, reconstructing geometry, tolerances, and GD&T callouts for legacy parts lacking documentation; **drawings were released to production and used to manufacture parts.**
- Designed and deployed the shop's **production quality-control system**, replacing a paper-based inspection workflow with **enforced dimensional verification** that hard-stops a job when a reading falls out of spec, staging inspection from **casting to first-article to QA-approved-to-ship** with blind re-measurement; used daily by **6 machinists** across **~10 work orders per day.**
- Operated **manual lathes independently across the full job scope** — interpreting drawings, planning operation sequence, selecting tooling and speeds/feeds, and performing in-process dimensional inspection to hold specified tolerances.
- Manufactured precision components on **CNC mills and lathes**, frequently **operating 2–3 machines** concurrently and holding tolerances as tight as **±0.001 in.**; proposed **revised CAD designs** of existing components to improve manufacturability and reduce machining operations.

Front Suspension Team (1st Place Overall OktoBAJAfest)

Sept. 2025 – Present

Baja SAE, Western University

London, ON

- Conducted design and manufacturing of the front suspension for an **SAE Baja** off-road vehicle by independently researching manufacturing methods and design trade-offs under competition constraints.
- Improved prior suspension design, contributing to **1st place finishes in Hill Climb (15.72 s), Short Track (24.32 s), Baja Cross (79.07 s), and Endurance** under varied dynamic loading conditions.
- Redesigned and modeled suspension components in **SolidWorks**, including the **spherical plain bearing (uniball)**, conducting iterative design refinement to optimize strength, manufacturability, and assembly integration.

PROJECTS

Shoulder Motion Simulator Actuator Design — SolidWorks, Engineering Drawings, Actuators

- Developed and **evaluated five linear actuator concepts**, including a magnetic linear actuator, using weighted decision matrices comparing force output, response time, manufacturability, and system constraints against targets of **140 N force and under 1 kg system mass.**
- Produced detailed **SolidWorks engineering drawings** with tolerances, section views, and assemblies to support design validation and selection of a rack-and-pinion actuator, incorporating DFM/DFA principles to improve assembly efficiency.

Kinetic Energy Measurement Device for Hailstones — Rapid Prototyping, SolidWorks, Physical Testing

- Designed and built a portable experimental system to measure hailstone kinetic energy prior to ground impact, integrating mass capture, velocity measurement, and energy calculation under a **\$100 budget** constraint.
- Validated accuracy and durability through controlled testing, achieving velocity measurements within a **5.1% standard deviation**, a **99% funneling success rate over 150 drops**, and an average **deployment time of 27 seconds.**

INTERESTS AND ACTIVITIES

Leadership: Prime Minister (Student Body President), Meadowvale S.S. — ran school events for 200–400 attendees, incl. the school's first offsite semi-formal; **SHAD** national design project — pitched to CEOs, won **\$1,000 prize** + Brilliant Catalyst Accelerator invitation; Toastmasters; Baseball Umpire

Volunteering: MusicBox — teaching music to children in care; Child Haven International — 12 years fundraising for orphaned children in Asia

Interests: FIRST Robotics, Automotive engineering, AAA Rep Baseball, Level 8 RCM Piano, Music production, Puzzles