Kelvin Cao

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Highlights

- Experienced **third year mechanical engineering** student with hands-on involvement in various engineering projects, possessing specialized knowledge in **vehicle engineering**.
- Proficient in using industry-standard **3D modeling and simulation software**, including **SolidWorks**, **AutoCAD**, and **ANSYS**.
- In-depth knowledge of **high-level programming languages** such as **Python** and **MATLAB**.

Education

University of Toronto Toronto, ON

BASc in Mechanical Engineering. Mechatronics and Solids Stream. cGPA: 3.87/4.0 Sept 2021 – Apr 2026 (expected)

Experience

University of Toronto Formula SAE Racing

Drivetrain Team Lead Sept 2022 – Present

- **Led a team of nine** in developing the drivetrain system and **successfully integrated** with other sections of the car, resulting in **1st, 5th, and 6th place victories** in **Formula SAE competitions** in New Hampshire, Michigan, and the Czech Republic, respectively.
- Designed and **optimized** mechanical components, such as sprockets and mounts, using both hand calculations and **ANSYS Finite Element Analysis** to achieve **mass reductions** of **over 40%**
- Conducted **DFMEA** on various components, such as driveshafts and sprockets, resulting in **harmonic and fatigue analysis** to ensure the reliability and durability of the components.
- Utilized **analytical methods** and first principles to determine heat loads and dissipation of the cooling system, including a **MATLAB cooling simulation** and a **heat transfer model** in **STAR-CCM+**, to **optimize** and **predict** the performance of the cooling system.
- Analyzed **real-life testing data** to provide feedback for **lap simulations** and force load cases, enhancing model accuracy to less than 10% error.

Nanz Pharma

Mechanical Engineering Co-op Student Jun 2023 – Sept 2023

- Maintained and created **design qualifications and installation qualifications** for Air Handling Units (AHU) and Rooftop Units (RTU), ensuring compliance with **Good Manufacturing Practice (GMP)** standards from governmental agencies in a pharmaceutical context, to be submitted to the government for review.
- Employed **AutoCAD** to create technical **mechanical and electrical drawings**, resulting in increased accuracy of engineering drawings and improved efficiency of the Regulatory Affairs **(**RA) department's validation process for the manufacturing plant.
- Demonstrated expertise in dealing with various standards, including **ISO**, **ASTM**, and **NEMA** by integrating them into company-wide Standard Operating Procedures (SOPs) and preventative maintenance documentation using QT9 quality management system (QMS) software.
- Contributed to the design of a **large scale pharmaceutical manufacturing product** by **sourcing and specifying** various parts, including a high shear pump, that enabled the **first ever production batch** of povidone iodine at the company.

Engineering Strategies & Practice II

Project Designer Jan 2022 – Apr 2022

- As part of a team of six, innovatively designed a **3D-printed**, adjustable book stand for E.J Pratt Library, resulting in a **70% lower production cost** than similar alternative options on the market.
- Implemented effective **project management** techniques, including the use of **Gantt charts**, to assign tasks within the team and facilitate **efficient workflow and communication** with the engineering manager.
- Developed and presented a comprehensive final proposal for a client, including **3D renders** and **engineering document deliverables**, resulting in its **successful implementation** at the E.J Pratt Library.

Certifications

Certified SOLIDWORKS Professional in Mechanical Design | Dassault Systèmes Dec 2022

Machine Shop Training (Mill, Lathe, Drill press, Vertical Bandsaw) | University of Toronto Nov 2021