# Richard Meng

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## Experience

### PRODUCT ENGINEERING INTERN | R&D Fluid Transport, Hanon Systems Canada

**May 2021 – June 2022 | Belleville, Canada**

- Developed and organized the builds of fluid transport prototypes for automotive thermals. Work included projects for electric vehicles from Ford, GM, and Lucid.
- Applied engineering and design knowledge, testing, prototyping.
- Completed 342 prototype build requests under historically high demand.
- ”Best engineering intern in the history of Hanon Belleville” (From Available Ref. Ltr.)

### LEAD LAB TEACHING ASSISTANT | Engineering Graphics

**Fall 2023, 2024 | Kingston, Canada**

- Led and organized 2 other TAs in lab sessions of more than 80 students.
- Performed live Solidworks demonstrations, presenting and explaining content.
- Supervision of students, mentorship of smaller groups, tutorials, and marking.

## Research and Projects

### SMALL-CELL TRAINING OF ML MOLECULAR DYNAMICS DESCRIPTORS

Python | Molecular Dynamics, Machine Learning, HPC

- Winner of L. M. Arkley Prize, Submitting to Computational Materials Science.
- An accelerated active learning approach to circumvent the superlinear scaling of atom count during training set generation.
- Our training protocol achieves up to 100× compute speedups vs. more conventional approaches while retaining comparable accuracy in benchmarks.
- Fully automated and partially parallelized active learning on computing clusters.

### COMPUTATIONAL MODEL OF MANIFOLD: 3RD PLACE PEO COMPETITION

Python, OpenFOAM | Model Tuning, Fluid Dynamics

- 3rd Place: Professional Engineers Ontario, Kingston, Engineering Competition
- Development of a computational fluid dynamics model for Condair Inc., a global industrial humidifier manufacturer.

### LISTEN TO THE PATH: CUHACKING HACKATHON WINNER

C#, Unity | Graph Algorithms, Maze Generation

- The team won Best Game and Best Hack (project) out of over 200 participants.
- Developed a procedural and accessible maze game with support for the visually impaired. The game is playable solely off sound cues with voice-control support.

### PIN-JOINTED STRUCTURE SIMULATOR

Python, TypeScript, React, SciPy | Graph Algorithms, Energy Optimization, FEM

- Interactive web-based FEM simulation of user-defined structures under load.
- Stress and displacement calculated by gradient descent energy optimization.

Please see my personal website for more about projects, experience, and skills.

## Honors & Awards

**Best UNENE 2024 Student Thesis**
Best student thesis (7-min presentation) at workshop.

**L. M. Arkley Prize**
Best Mech. Eng. undergrad research paper, supported by an oral presentation.

**Colin T. Bayne Memorial Award**
Graduating Mech. Eng. student showing most proficiency in innovative design.

**Conn-Gilbert Award**
Highest average in the core courses in thermodynamics.

**CGS-M NSERC Scholarship**

**R. Samuel McLaughlin Fellowship**

**Lorne C Elder Scholarship**

**Lena MacNeil Scholarship**

**Dean's Scholar**

## Education

### QUEEN'S UNIVERSITY

MASc Mechanical Engineering, Co-Supervised with Computer Engineering

Cumulative GPA: 4.3 / 4.3

**Sep 2023 - Exp. 9/25 | Kingston, Canada**

BASc Mechanical Engineering

Cum. GPA: 4.18 / 4.3 , (90+ avg.)

**Sep 2018 - April 2023 | Kingston, Canada**

## Skills

### PROGRAMMING

Python • Git • C# • C++ • JavaScript • TypeScript • HTML • CSS • LaTeX

### LIBRARIES/FRAMEWORKS

Git • SciPy • Pandas • NumPy • React • SLURM