Richard Meng

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Work 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 POTENTIAL

Python | Molecular Dynamics, Machine Learning, High-Performance Computing

Published in Computational Materials Science

- An accelerated machine learning potential model development method by selecting small atomic cells during active learning.
- Our training protocol achieves more than 10× compute speedups vs. more conventional approaches while retaining comparable accuracy in benchmarks.

GPU OPTIMIZATION MOLECULAR DYNAMICS ML MODEL

C++, Kokkos, CUDA tools | Parallel Algorithms, Machine Learning, Molecular Dynamics

- CPU Optimizations over previous CPU implementation with up to 3× speedups.
- New GPU implementations with strong performance on diverse hardware and for diverse problem sizes. Kokkos and CUDA optimization tools.

LISTEN TO THE PATH: CUHACKING 2021 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.

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. 2023.

Please see my personal website for additional information.

Honors & Awards

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

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.

Alexander Bell CGS-M Scholarship

R. Samuel McLaughlin Fellowship

Lorne C Elder Scholarship

Lena MacNeil Scholarship

Dean's Scholar

Education

QUEEN'S UNIVERSITY, CANADA

MASc Mechanical Engineering, Co-Supervised with Computer Engineering

Cumulative GPA: 4.3 / 4.3

Sep 2023 - Expected Sep 2025

BASc Mechanical Engineering

Cumulative GPA: 4.18 / 4.3

Sep 2018 - April 2023

Skills

PROGRAMMING

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

LIBRARIES/FRAMEWORKS

MPI • Kokkos • NumPy • SLURM • Git • CUDA