Zijian MENG

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Ontario, Canada

Education

2023–Present   **Master's of Applied Science, Mechanical and Materials Engineering (Co-supervised with Electrical and Computer Engineering)**
Queen's University, Kingston, Canada
4.3/4.3 GPA

2018–2023   **Bachelor's of Applied Science, Mechanical and Materials Engineering**
With Professional Internship
Queen's University, Kingston, Canada
4.18/4.3 GPA

Employment

September–Present   **Computational Modelling Intern**, *Canadian Nuclear Laboratories*, Chalk River, Canada
- Collaborated with experimental scientists to model helium in neutron-irradiated 304 stainless steel from a salvaged component of the National Research Universal reactor.
- Applied Object Kinetic Monte Carlo simulations for helium and defect distribution and effects.

Fall 2023 & 2024   **Lead Lab Teaching Assistant**, *Queen's University*, Kingston, Canada
- Engineering Graphics Course: Led 2 other TAs in lab sessions of more than 80 students.
- Live demonstrations, management of sessions and students, tutorials, and marking.

Winter 2023   **Teaching Assistant**, *Queen's University*, Kingston, Canada
- Automatic Control Course: Communicating with students, marking, and proctoring.

May 2021 – June 2022   **Product Engineering Intern**, *Hanon Systems Canada*, 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.
- Completed 342 prototype build requests under historically high demand.

Research Experience

2023–Present   **Master's Student Researcher**, *Queen's University*, Kingston, Canada
Nuclear Materials Group, Computational Materials
- Development, training, and validation of machine learning interatomic potentials in systems including Na–K–Cl–O, Ni, Si–O, Si–C; involved with Cu–H, Fe–Ni–Cr, Zr–H.
- Proposed a cost-aware basis set pruning algorithim, optimizing cost-accuracy significantly.
- Programmed a more optimized CPU and new GPU implementation of the Moment Tensor Potential in LAMMPS.
- Contributions yielded up to $13\times$ CPU inference speedups at equal or better accuracy.

Winter 2023   **Undergraduate Research Project**, *Queen's University*, Kingston, Canada
Nuclear Materials Group, Computational Materials
- Development, training, and validation of machine learning interatomic potentials.

Publications

Internal Review	**Meng, Z.**; Zongo, K.; Thoms, M.; Grant, R. E.; Béland, L. K. Accelerating Moment Tensor Potentials through Post-Training Pruning. arXiv preprint arXiv:2510.19737
Submitted 2025	**Meng, Z.**; Zongo, K.; Torres, E.; Maxwell, C.; Grant, R. E.; Béland, L. K. A Kokkos- Accelerated Moment Tensor Potential Implementation for LAMMPS. arXiv preprint arXiv:2510.00193
Published 2025	**Meng, Z.**; Sun, H.; Torres, E.; Maxwell, C.; Grant, R. E.; Béland, L. K. Small-cell-based fast active learning of machine learning interatomic potentials. Computational Materials Science 2025, 256, 113919.

Honors and Awards

2024	**UNENE Best Student Presentation** Best student presentation at the UNENE conference in the 7-minute category.
2024	**NSERC Alexander Bell CGS-M Scholarship** The Natural Sciences and Engineering Research Council of Canada's nationwide Master's graduate scholarship.
2023	**R. Samuel McLaughlin Fellowship**
2023	**L. M. Arkley Prize** Awarded for the best fourth-year Mechanical Engineering paper and presentation.
2023	**Colin T. Bayne Memorial Award** Awarded to the graduating Mechanical Engineering student who, in the opinion of the Department, has shown most proficiency in innovative design..
2023	**Conn-Gilbert Award** Awarded to the graduating Mechanical Engineering student with the highest average in core Thermodynamics courses.
2023	**3rd Place—Professional Engineers Ontario, Kingston, Engineering Competition**
Various	**Dean's Scholar**
2022	**Lorne C Elder Scholarship**
2021	**Best Project and Best Game Award, CuHacking Hackathon**
2018	**Lena MacNeil Scholarship**

Presentations and Posters

Presentation 2024	**Simulating Complex Chemistry for Advanced Reactors: Machine Learning Potentials in Action** UNENE Student Presentations, 7-minute category
Poster 2023	**Systematic Small-Cell Training Set Selection** UNENE Student Posters