Kayla B. Clements

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Education

Ph.D., Nuclear Engineering, Oregon State University, *GPA 3.76* 2024
Dissertation: *Uncertainty Quantification and Global Sensitivity Analysis Methods for Monte Carlo Radiation Transport Solvers*

B.S., Nuclear Engineering, University of Florida, *Cum Laude* 2019

Relevant Experience

Computational Physics Research Assistant 2025 - Present
Center for Exascale Monte Carlo Neutron Transport, Oregon State University
- Co-developer of Monte Carlo/Dynamic Code (MC/DC), a Python-based neutron transport code focused on CPU/GPU performance and machine-portability
- Re-factor MC/DC to make code more modular for improved testing, debugging, and experience for external developers
- Lead weekly developer meetings and track feature integration using GitHub Projects

Radiation Effects and Theory Intern 2021 - 2024
Sandia National Laboratory
- Developed uncertainty quantification and global sensitivity analysis methods for stochastic solvers and tested with Monte Carlo radiation transport software
- Derived statistical properties of developed methods and compared with standard MC-MC approach

Graduate Research Assistant 2020 - 2024
Center for Exascale Monte Carlo Neutron Transport, Oregon State University
- Introduced the developed UQ method as an integrated feature of MC/DC to handle parameter uncertainty in material properties, source strength/angle, and geometry
- Contributed as author, co-author, and presenter on developed methods for journal publications, professional conferences, and progress reports to NNSA (PSAAP-III Center)
- Acted as Instructor of Record for Mechanical Engineering Methods, a junior-level numerical methods course for undergraduates

Reactor Physics Analysis & Design Intern 2019 - 2020
Idaho National Laboratory
- Modeled fuel assemblies in MCNP for INL's Transient Reactor Test (TREAT) Facility using fabrication and technical specification documents from reactor's previous design work
- Integrated developed fuel models into existing TREAT model and performed criticality studies using MCNP

Skills

- Proficient in Python for scientific computing, familiar with C++
- Proficient with MCNP, familiar with SCALE (KENO)
- Extensive work with high-performance computing environments
- Familiar with team-based software development and maintenance of large codebase (e.g., profiling, debugging, documenting, testing, packaging, and version control with git)

Relevant Coursework

- Neutronic Analysis, Advanced Reactor Physics, Deterministic Particle Transport, Thermohydraulics
- Numerical Solutions for ODEs and PDEs, Computational Mathematics for Multiphysics
- Software Development for Engineering Research, Applied Parallel Computing