Dustin Lee Enyeart

Mathematics | Physics | Programming | Technical Writing

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https://gitlab.com/users/dustin_lee/projects

https://dustin-enyeart.github.io

Summary

Deep knowledge of applied mathematics, scientific computing, theoretical physics, computational physics and coding. Dissertation on neural networks and differential equations. Seeking to solve interesting problems in an innovated environment.

Education

Bachelor's degree in Mathematics, University of New Mexico (3.57 GPA)
Master's degree in Mathematics, Purdue University (4.00 GPA)
Doctorate degree in Mathematics, Purdue University (3.84 GPA) (December 2024)

Technical Skills

Programming Languages: Python, C/C++
Scientific Computing: Finite-Difference Method, Finite-Element Method, Numerical Linear Algebra
Physical Modeling: Computational Electromagnetism, Density Functional Theory, Molecular Dynamics
Artificial Intelligence: Scientific Machine Learning, PyTorch, Torch Lightning, Torch Geometric
Data Science: Probability, Statistics, Data Analysis
Parallel Computing: Threads, MPI, CUDA
Software Development: GNU/Linux, Bash, Git, GDB, CMake, Slurm, Hydra
Technical Writing: LaTeX, Markdown, reStructuredText, Sphinx

Relevant Coursework

Besides the mathematics curricula for my degrees, I have taken additional graduate-level courses on a variety of topics, such as physical modeling, computer science, artificial intelligence, material science engineering, nuclear engineering, electrical engineering and semiconductor fabrication. Furthermore, the majority of my studies have been done independently of my schoolwork.

Selected Projects

Operator Learning: Implemented and studied several neural operator architectures to solve differential equations with PyTorch with Lightning. Preformed hyperparameter optimization with grid searches and Bayesian searches using the Ax Platform. Introduced novel loss terms for Koopman autoencoders that improved performance. Trained models on GPU clusters and scheduled jobs with Slurm. Used Hydra for configurations. Used Neptune AI for logging.

Xray Sources: Simulated several xray sources and studied their spectra. Used C++ and Geant4 to implement an xray tube an a wiggler. Used Python to implemented an undulator and a van-der-Waals source. The density functional calculations to compute the electronic structure of the van-der-Waals materials were done with ASE and GPAW.

Bias Detection in Wikipedia: Implemented natural language processing methods, such as the transformer, to detect bias in Wikipedia using Python and PyTorch