Maxwell Bolt

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OBJECTIVE

- To improve quality of life through data-driven & physics-inspired mathematical modeling.

EDUCATION

PhD: Purdue University – CGPA: 3.44/4.0 **West Lafayette, IN** **Graduation: 05/2029**
- Doctor of Philosophy in Mechanical Engineering
- Second-year PhD student researching Scientific Machine Learning
- Thesis advised by Professor Ilias Bilionis

BS: Purdue University – CGPA: 3.5/4.0 **West Lafayette, IN** **Graduation: 08/2023**
- Bachelor of Science in Mechanical Engineering
- Piloted Purdue's first class of the Learning While Working program, earning a co-op Certificate
- Passed Fundamentals of Engineering Exam
- Recipient of Harvey Scheffer & Catherine Scheffer Scholarship

RESEARCH & TEACHING EXPERIENCE

Graduate Research Assistant **West Lafayette, IN** **Aug 2023 – Present**
- Graduate research assistant in Predictive Science Lab under the guidance of Professor Ilias Bilionis
- Propagating uncertainty through high-dimensional scientific models to solve inverse problems
- Modeling of stochastic signals with heteroscedastic noise using physics-inspired algorithms
- Prefers Bayesian methods such as Gaussian Processes / Information Field Theory
- Deploy and monitor GPU/CPU-accelerated jobs on Purdue's high performance computing cluster

Instructor for Undergraduate Data Science Course **West Lafayette, IN** **Aug 2025 – Present**
- Course coordinator for ME 239: Introduction to Data Science for Mechanical Engineering
- Leading a team of instructors, TAs, and graders to teach 250 sophomores in the inaugural course offering
- Wrote the syllabus, lecture notes, and course assessments, contributed to online textbook

Scientific Machine Learning TA **West Lafayette, IN** **Aug 2024 – May 2025**
- Created online textbook materials for ME 697: Advanced Scientific Machine Learning
- Developed data science homework assignments to integrate into the core undergraduate ME curriculum
- Constructed Jupyter notebooks for students to run themselves and experiment in Google Colab

Undergraduate Research Assistant **West Lafayette, IN** **Aug 2021 – Aug 2022**
- Undergraduate research assistant in Purdue Experimental Turbine Aerothermal Laboratory
- Wrote data collection and processing scripts for turbine test cell
- Designed and performed FEA analysis on parts for turbine dyno rig and hypersonic prototyping water table

INDUSTRY EXPERIENCE

Cummins Inc **Columbus, IN** **Jan-Dec 2022, May-Aug 2024**
- Pioneered a new method that performs transient calibration on diesel engines
- Optimized models for engine duty cycles and validated on EPA-designed tests
- Supported various engine platform teams looking to implement the new calibration program
- Created a repository of various machine learning model architectures for engineers to apply to new problems

ACADEMIC PROJECTS

Bayesian PINNs for JAX
- Final project for ME 697: Advanced Scientific Machine Learning
- Recreated an application of Bayesian physics-informed neural networks in GPU-capable JAX code
- Modeled COVID-19 dynamics as regularized by a spring-mass-damper system, using NUTS and SGLD

Freedom Cycle – Senior Capstone Project
- Sponsored by Constellation Energy, the nation's largest producer of clean energy
- Built Freedom Cycle prototype, a Rankine Cycle modification estimated to have 7% fuel savings

RELEVANT SKILLS

Frequently Used Python Libraries

JAX	PyTorch	Blackjax	NumPyro

Design Skills

High-performance computing	Thermofluid systems	CAD	NI Labview