Criston Hyett

Fields Of Interest

Dynamical Systems & Optimal Control, Reduced-Order Modeling,
Physics-Informed Machine Learning, Uncertainty Quantification

Education

2019-2025 (expected) **Ph.D.**, *University of Arizona*, Tucson, AZ.
Applied Mathematics

2019-2021 **M.S.**, *University of Arizona*, Tucson, AZ.
Applied Mathematics

2012-2016 **B.S.**, *University of Arizona*, Tucson, AZ.
Mathematics & Physics

Research

2021-present **Enabling PDE Constrained Optimization via Differentiable Solvers**

We approach PDE constrained optimization from a "physics-first" perspective, by creating efficient PDE solvers compatible with backward-mode autodifferentiation for favorable computation scaling with parameter dimension. A motivating problem for this work is performing optimal gas scheduling with respect to cost and uncertainty.

2020-present **Physics-Informed Machine Learning for Heavy-Tailed Distributions**

Implementing custom PyTorch modules, we embed physical knowledge into machine learning models to learn reduced-order models for fine-scale structures in turbulent flow.

Work Experience

Summer 2023 **Google Summer of Code contributor**, *NumFocus/Julia SciML*.
- Implemented staggered-grid symbolic discretization for PDEs in MethodOfLines.jl
- Modified, scheduled and analyzed CI jobs

2020-present **Graduate Research Assistant**, *University of Arizona*, Tucson, AZ.

Summers 2020-22 **Graduate Student Researcher**, *Los Alamos National Labs*, Los Alamos, NM.

2016-2019 **Software Engineer II**, *Raytheon Missile Systems*, Tucson, AZ.
- Designed, implemented, tested and integrated signal processing algorithms in an embedded environment
- Mentored other engineers, acted as scrum master, interfaced with customers and stakeholders

Computer Languages

Proficient	Julia, Python, C/C++
Comfortable	Bash, Matlab
Beginner	Cuda

Computer skills

Open SW	git/workflow, LaTeX, Linux
HPC	Slurm, Docker, parallel & accelerated computing
Methodologies	CI, TDD, Agile, OOP

Service and Leadership

Mar 2023 Graduate Mentor for American Statistical Association DataFest Competition

Quarterly 2021-2022 Organized and presented "Introduction to HPC" seminar for Math PhD students

Aug 2021 - May 2022 SIAM Brownbag Student Colloquium Organizer

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