Criston Hyett

Fields Of Interest

Physics-Informed Machine Learning, Reduced-Order Modeling, Optimization

Education

2019-2024 (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

Experience

2021-present **Graduate Research Assistant**, *University of Arizona*, Tucson, AZ.

Summer 2021 **Graduate Student Researcher**, *Los Alamos National Labs*, Los Alamos, NM.

2020-2021 **Graduate Research Assistant**, *University of Arizona*, Tucson, AZ.

Summer 2020 **Graduate Student Researcher**, *Los Alamos National Labs*, Los Alamos, NM.

2019-2020 **Graduate Teaching Assistant**, *University of Arizona*, Tucson, AZ.

2016-2019 **Software Engineer II**, *Raytheon Missile Systems*, Tucson, AZ.

Talks

Nov, 2021 Machine Learning Statistical Evolution of the Coarse-Grained Velocity Gradient Tensor
APS Division of Fluid Dynamics Meeting

Mar, 2021 Machine Learning Stochastic Differential Equations: Applications in Reduced-Order Models of Turbulence
SIAM Student Brownbag

Nov, 2020 Machine Learning Statistical Lagrangian Geometry of Turbulence
APS Division of Fluid Dynamics Meeting

Teaching

Fall 2019 Math 112: College Algebra

Spring 2020 Math 112: College Algebra

Fellowships

Jan 2022 - present Roots for Resilience Data Science Scholarship *University of Arizona Data Science Institute, Arizona Institute for Resilience*

Computer Languages

Julia	Proficient	*Used daily in development of research software*
C/C++	Proficient	*Used extensively in an embedded environment at Raytheon Missile Systems*
Bash	Comfortable	*Basic functionality used daily*

Python	Comfortable	*Used weekly*
R	Beginner	
Matlab	Comfortable	*Interpretted monthly*
Cuda	Beginner	
Ada	Comfortable	*Interpretted daily while at RMS*

Computer skills

Open Software	git, github, LaTeX
HPC	Slurm
Methodologies	CI (Jenkins), TDD, Agile
Operating Systems	Linux, Windows

Service and Leadership

Aug 2021 - present	SIAM Brownbag Student Colloquium Organizer
Jul 2018 - Jul 2019	Certified Scrum Master: Scaled Agile Framework

Interests

Reproducible, Interpretable Science	Using the paradigm of *Literate Programming* and *Test Driven Development* with a minimal toolchain built from Emacs & git, to co-locate scientific justification with source controlled software, and reproducible results.

Human Languages

English	Native Speaker
Spanish	Basic
Japanese	Beginner
Amharic	Beginner

Roots for Resilience in Data Science Scholarship Program

February 5, 2022

Arizona Institues for Resilience & Data Science Institute,
University of Arizona

To whom it may concern,

I, along with an interdisciplinary group from the University of Arizona and Los Alamos National Labs, work to develop reduced order models of turbulent flows. Turbulence continues to produce some of the largest and most intricate datasets in the world, and our research works to find spatiotemporal patterns that allow a more concise description of this ubiquitous - yet still mysterious - phenomenon. Further, turbulence provides a challenging proving ground for the latest in data science and machine learning. My work under this program would be twofold. First, create standardized, parallelizable templates to access the John Hopkins Turbulence Database (JHTDB) and enable the rapid prototyping of data-driven methodologies. JHTDB provides upwards of 430 Terabytes of highly resolved turbulence data along with powerful server-side preprocessing. This combination is an incredible enabler of data science in turbulence, however the interface is feature-rich and naive queries are prohibitively expensive due to the size and complexity of the datasets - I would produce a short document along with efficient templates to shorten the learning curve for researchers wanting to access the database. Second, I plan to dive deep into containers and export the resulting knowledge to my colleagues in the Mathematics department to allow for archive-quality, reproducible, scientific repositories.

After completion of this work, researchers interested in applying data-driven methodologies to turbulence would have efficient access to a large and vetted database. Further via presentations to my colleagues, I would diffuse experience using containers to create repositories with guaranteed reproducibility.

I appreciate your consideration,

Criston Hyett

Attached: curriculum vitæ