Dustin Nguyen

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Summary: Experienced AI/ML Scientist and Astrophysicist (Physics PhD). Currently based out of Seattle, WA.

Work Experience

Leidos Remote, USA
▷ *Senior Machine Learning Research Scientist* *03/2025 - Present*

- Solutioning for various capture efforts at Leidos Innovation Center (LInC). Primarily focused on proposing novel SciML/Physics-Informed architectures towards problems in National Security.
- Technical contributor for a DARPA program using Graph ML for Space Situational Awareness tasks...
  Led and executed development of time-series AI/ML-based surrogate that is >1000 times faster than an existing implementation of a traditional physics-based algorithm. More details to come.
- Technical Contributor for an IARPA program for remote-sensing detection of chemical aerosols. Built and maintained internal Python packages with automated CI/CD workflows for testing, versioning, and deployment to a private PyPI server. Contributed to model development and provided solutions to existing problems with the logistic regression model.

Lockheed Martin Denver, CO
▷ *Senior Machine Learning Engineer* *03/2024 - 03/2025*

- Technical contributor and primary developer for a DARPA program focused on utilizing Controlled Neural ODEs as a surrogate model in the AFSIM simulation environment. Ensured the Python-based (PyTorch) model was capable of operating as a plugin into AFSIM, C++ based, environment. Conducted feasibility experiments of different AI/ML techniques to improve Neural-ODE based surrogate model and constructed SharePoint slides detailing quantified results to present to the Government customer in monthly update meetings.
- Contributed to corporate IRAD focused on using AI/ML methods for deciding tactics in AFSIM scenarios. Used Meta's pre-trained data2vec2.0 pre-trained model for this task.

Los Alamos National Laboratory Los Alamos, NM
▷ *Applied Machine Learning Fellow* *05/2022 - 08/2022*

- Contributed to research focused on modeling with Scientific Machine Learning with Universal Differential Equations - using the geophysical Korteweg-de Vries equation as a toy model using Julia SciML packages.

The Ohio State University Columbus, OH
▷ *Graduate Research Assistant and NASA FINESST Fellow* *08/2020 - 12/2023*

- Used computational methods to understand how starburst galaxies launch multiphase winds - which is related to how galaxies evolve. Resulted in 10 published peer-reviewed papers, with 6 being first author. My papers proposed new ideas that challenged assumptions of previous models and verified their feasibility through simulation (C++/Python) experiments and derivation of new analytic equations and relationships.

Award

- NASA FINESST Fellowship | PhD student led proposal $\sim$8% acceptance rate, $\sim$ $97K 2022

Technical Skills

Toolkit: JIRA, CI/CD Pipelines, Git, Python, PyTorch, Mlflow, Linting, Unit Tests

Specialization: Time-Series Prediction, Transformers, SciML, Neural ODEs/CDEs/SDEs

Knowledge: Physics, Numerical Methods, Orbital Mechanics, Flight Dynamics, Quaternions, Machine Learning

Publications (Total 10, Six first-author papers.)

Machine Learning

- "Neural ODEs as a discovery tool...," Nguyen et al. 2023, NeurIPS 2023 Workshop on M.L. and Physical Sciences.
- "Neural Astrophysical Wind Models," Nguyen, 2023, ICML 2023 Workshop on M.L. for Astrophysics.

Astrophysics *(PhD research: Multi-dimensional simulations of multi-phase winds from starburst galaxies)*

- 4 first author papers in MNRAS, MNRAS Letters, and Astrophysical Journal Letters. 4 co-author papers.

Education

Ph.D. in Physics, The Ohio State University *08/2018 - 12/2023*
M.S. in Physics, The Ohio State University *08/2018 - 05/2021*
B.S. in Physics and Astrophysics, Arizona State University *08/2014 - 05/2018*