

Tyler Shakibai

tyler.shakibai@gmail.com | tylerhakibai.github.io/ | github.com/TylerShakibai | linkedin.com/in/tylerhakibai

EDUCATION

University of Washington

Master of Science in Applied Mathematics

Seattle, WA

2022 - 2023

University of Massachusetts Amherst

Bachelor of Science in Applied Mathematics

Amherst, MA

2018 - 2021

- Minor in Computer Science

EXPERIENCE

Associate Professional Staff

Johns Hopkins University Applied Physics Laboratory

July 2023 – present

Laurel, MD

- Developed reduced order models for simulating physical systems.

Graduate Teaching Assistant

University of Washington

December 2022 – June 2023

Seattle, WA

- Graduate TA for AMATH 301: Introduction to Scientific Computing.
- I held daily office hours for a course of 300+ students, helping them debug their programming implementations and reinforcing topics in numerical analysis.

Undergraduate Research Assistant

The Statistical and Applied Mathematical Sciences Institute

May 2021 – August 2021

Research Triangle Park, NC

- Worked with professors and post-docs on a dynamical model for the spread of COVID-19 in North Carolina.
- Formulated systems of differential equations, determined the existence of limit cycles, and implemented the system in MATLAB.
- Presented my results to professors and graduate students.

PROJECTS

Solar Spectra Model

- Designed convolutional neural network in PyTorch to predict the solar spectrum composed of wavelength and irradiance.
- Used over 20 years of time series weather data from Seattle including temperature, pressure, precipitation, etc.
- Maintained similar accuracy to current physics-based prediction models while reducing computational complexity.

Physics-Informed Neural Network

- Created and trained a neural network in TensorFlow which solves the partial differential equations for the heat and wave equations and produces a continuous function as output.
- Conditioned model to respect physical laws such as conservation of energy to reduce the computational complexity of training and made adjustments to account for periodicity in the wave equation.
- Presented my finding and discussed the benefits and drawbacks compared to conventional numerical schemes.

SIR Model for COVID-19

- Simulated the evolution of a compartment model for the spread of COVID-19 accounting for population variance in MATLAB.
- Solved system of ODEs, analyzed the stability of trajectories, and used numerical methods to approximate Lyapunov exponents.

SKILLS

Programming Languages: Python, MATLAB, C, C++, Java, JavaScript, SQL, R, PyTorch, TensorFlow, LaTeX

Libraries: NumPy, Matplotlib, pandas, scikit-learn, Keras, SciPy, SymPy, OpenCV, seaborn, MPI, CUDA

Web Development: HTML, CSS, Node.js, React, Django, Flask, Bootstrap

Visualization: Tableau, Power BI

ACTIVITIES AND AWARDS

Club Organizer

Math Club

2019 – 2021

UMass Amherst

- Gave and organized talks on various mathematical topics.

Jacob-Cohen-Killam Math Competition

First Place

2020

UMass Amherst

- Won math competition for first and second-year undergraduates at UMass Amherst.

Chancellor's Scholarship

2018 - 2021