

# Tyler Shakibai

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## EDUCATION

### University of Washington

*Master of Science in Applied Mathematics*

Seattle, WA

2022 - present

### University of Massachusetts Amherst

*Bachelor of Science in Applied Mathematics*

Amherst, MA

2018 - 2021

- Minor in Computer Science

## EXPERIENCE

### Research Assistant

*TRIPODS Institute for Theoretical Foundations of Data Science*

January 2022 – June 2022

Amherst, MA

- Assisted research on alternative methods of constructing multi-frontal direct solver algorithms for mesh-based computations.
- Gave LaTeX presentations on finding optimal mesh sizes for discretized numerical schemes.

### 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.

### Information Technology Intern

*Entertainment Partners*

June 2021 – August 2021

Burbank, CA

- Set up computer hardware for use in an office setting.
- Addressed and resolved both hardware and software issues with workplace devices.

## PROJECTS

### Physics Inspired 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 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, Java, C, JavaScript, SQL, MATLAB, R, PyTorch, TensorFlow, and LaTeX

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

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

**Visualization:** Tableau, Power BI

## ACTIVITIES AND AWARDS

### Club Organizer

*Math Club*

2019 – 2021

UMass Amherst

- Gave and organized talks on various mathematical topics.

### Member

*Machine Learning Club*

2019 – 2021

UMass Amherst

- Worked collaboratively on machine learning projects.

### 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

### Dean's list

2018 - 2021