

## EDUCATION

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### University of Maryland, College Park

Applied Mathematics PhD Student, GPA: 3.89

- Application Area: Quantum Information

College Park, MD

2020–Current

### SUNY Brockport

B.S. in Mathematics and Physics, GPA: 4.00

- Thesis: “Spectral properties of quaternionic unit gain cycles.”

Brockport, NY

2016–2020

## EXPERIENCE

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### Los Alamos National Laboratory

Quantum Computing Summer School Fellowship

Advisor: Dr. Yigit Subasi

Los Alamos, NM

Summer 2021

### University of Maryland

Training and Research Experiences in Nonlinear Dynamics (TREND) REU

Advisors: Dr. Michelle Girvan, Dr. Ed Ott, Dr. Thomas Antonsen

College Park, MD

Summer 2019

- Project title: Predicting Network Dynamics with a Parallel Machine Learning Approach
- Developed a parallel reservoir computing method to predict the dynamics of Kuramoto oscillator systems, which are novel network-coupled systems that exhibit complex dynamics even at relatively low dimensions.
- Wrote the object-oriented code in MATLAB which ran the prediction method
- Analyzed the performance of the predictions and made improvements to our proposed method to further increase prediction accuracy.

### University of Rochester

Photonics REU

Advisor: Dr. Benjamin Miller

Rochester, NY

Summer 2018

- Project title: Finite-Element Modeling of Waveguide Structures Using COMSOL® Multiphysics
- Used the RF Module within COMSOL to model electric field strength of different waveguide structures/materials in order to optimize the electric field strength at the surface of the waveguide. This was part of a larger project for utilizing photonic ring resonators in single-molecule/virus biological sensing applications.

## PUBLICATIONS

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- [1] N. J. Coble\* and M. Coudron, “Quasi-polynomial time approximation of output probabilities of geometrically-local shallow quantum circuits.”, 2021. arXiv: 2012.05460.
- [2] F. Belardo, M. Brunetti, N. J. Coble, N. Reff, and H. Skogman, “Spectra of quaternion unit gain graphs.”, In Preparation, 2020.
- [3] N. J. Coble\* and N. Yu, “A reservoir computing scheme for multi-class classification.”, in *Proceedings of the 2020 ACM Southeast Conference*, ser. ACM SE '20, Tampa, FL, USA: Association for Computing Machinery, 2020, pp. 87–93, ISBN: 9781450371056.

\*-main contributor

## GRADUATE COURSEWORK

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- **Computer Science:** Intro to Quantum Information Processing, Quantum Algorithms, Quantum Error Correction and Fault-Tolerance\*, The Foundation of End-to-End Quantum Applications\*
- **Mathematics:** Algebra I and II, Analysis I, Complex Analysis, Scientific Computing I\*

\*-to be completed through Fall 2021

## LANGUAGES

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- **Intermediate:** MATLAB, Python, Java
- **Beginner:** Bash, LabView, COMSOL RF Module

## TEACHING

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- **Graduate Teaching Assistant** for *Precalculus* at University of Maryland
- **Math Tutor** at SUNY Brockport

## INDEPENDENT PROJECTS

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- Title: Developing a novel classifier using reservoir computing methods Fall 2019  
*Using the method for recurrent neural networks known as reservoir computing (RC), I developed a simple multi-class classification technique which was comparable in performance to other novel approaches such as decision tree, naïve Bayesian, and a 3 layer neural network. Before this work, literature only existed for binary classification using RC. This project developed an altered method which increased performance while also expanding to multi-class problems. I developed the object-oriented method in Python. See [3] on first page for conference publication.*

## SCHOLARSHIPS AND AWARDS

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- Aziz Osborn Gold Medal in Teaching Excellence 2021
- University of Maryland Dean's Fellowship 2020
- SUNY Chancellor's Award for Student Excellence 2020
- School of Arts and Sciences Outstanding Undergraduate Award 2020
- Brockport Honors College Scholar Award 2020
- Robert E. Hall Memorial Scholarship for Mathematics 2020
- Department of Computer Science Undergraduate Research Award 2020
- Belva A. Waite Memorial Scholarship 2019, 2016
- Interdisciplinary Award in Mathematics 2018
- Harvard House Award 2018
- Brockport Physics, Mathematics, and Computer Science Award 2018, 2017
- Dean's Citation for Diversity, University of Rochester 2018