Nolan J. Coble

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Education

University of Maryland, College Park — College Park, MD
Computer Science PhD Student, GPA: 3.92 — 2020–present

- Advised by Matthew Coudron and Alexander Barg

SUNY Brockport — Brockport, NY
B.S. in Mathematics and Physics, GPA: 4.00 — 2016–2020

- Thesis: "Spectral properties of quaternionic unit gain cycles."
- Advised by Nathan Reff
- Member of the Honors college

Experience

Los Alamos National Laboratory — Los Alamos, NM
Quantum Computing Summer School Fellowship — Summer 2021
Advisor: Dr. Yigit Subasi

- Project title: Generating Polynomials of Density Matrices

University of Maryland — College Park, MD
Training and Research Experiences in Nonlinear Dynamics (TREND) REU — Summer 2019
Advisors: Dr. Michelle Girvan, Dr. Ed Ott, Dr. Thomas Antonsen

- Project title: Predicting Network Dynamics with a Parallel Machine Learning Approach

University of Rochester — Rochester, NY
Photonics REU — Summer 2018
Advisor: Dr. Benjamin Miller

- Project title: Finite-Element Modeling of Waveguide Structures Using COMSOL Multiphysics

Publications

[1] F. Belardo, M. Brunetti, N. J. Coble, N. Reff, and H. Skogman, "Spectra of quaternion unit gain graphs", *Linear Algebra and its Applications*, vol. 632, pp. 15–49, Jan. 2022, ISSN: 00243795.

[2] K. Srinivasan, N. J. Coble, J. Hamlin, T. Antonsen, E. Ott, and M. Girvan, "Parallel machine learning for forecasting the dynamics of complex networks", *Phys. Rev. Lett.*, vol. 128, p. 164 101, 16 Apr. 2022.

[3] N. J. Coble and M. Coudron, "Quasi-polynomial time approximation of output probabilities of geometrically-local, shallow quantum circuits.", in *Conference on Quantum Information Processing (QIP),* and *Symposium on Foundations of Computer Science (FOCS)*, 2021. arXiv: 2012.05460.

[4] Z. Holmes, N. J. Coble, A. T. Sornborger, and Y. Subaşı, "On nonlinear transformations in quantum computation", Preprint, 2021. arXiv: 2112.12307 [quant-ph].

[5] 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.

Graduate Coursework

Computer Science: Intro to Quantum Information Processing, Quantum Algorithms, Quantum Error Correction and Fault-Tolerance, End-to-End Quantum Applications, Scientific Computing, Advanced Numerical Optimization, Zero-knowledge Proofs*, Quantum Complexity*

Mathematics: Algebra I and II, Brauer Groups, Complex Analysis, Differential Geometry

*—to be completed through Spring 2023

Talks

[1] *Divide-and-conquer method for approximating output probabilities of geometrically-local, shallow quantum circuits*, Presented to The IQC-QuICS Math and Computer Science Seminar, 2021.

Course Projects

Brauer Groups: Division algebras and space-time block coding. Spring 2022

End-to-End Quantum Applications: Applications of block encodings in quantum computing. Fall 2021

Quantum Error Correction and Fault-Tolerance: QKD and error-correcting codes. Fall 2021

Quantum Algorithms: Hidden subgroup problem for semi-direct product groups. Spring 2021

Languages

Intermediate: MATLAB, Python, Java

Beginner: Bash, LabView

Teaching

Graduate Teaching Assistant for *Precalculus* at University of Maryland (Fall 2020 and Spring 2022)

Math Tutor at SUNY Brockport

Scholarships and Awards

Aziz Osborn Gold Medal in Teaching Excellence 2021

University of Maryland Dean's Fellowship 2020

SUNY Chancellor's Award for Student Excellence 2020

- Recognizes model students who have integrated academic excellence with other aspects of their lives and is the highest honor bestowed upon a student by the State University of New York system.

School of Arts and Sciences Outstanding Undergraduate Award 2020

- Recognizes the School of Arts and Sciences's top undergraduate student.

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