Stephen J. Smith
Curriculum Vitae

Contact Information

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Education

PhD, Mathematics
University of South Carolina, Columbia, SC, Spring 2022

Masters of Science, Mathematics
University of Delaware, Newark, DE, Spring 2016

Bachelor of Science, Mathematical Sciences
Minor in Philosophy
University of Delaware, Newark, DE, Spring 2014

Research

NSF MSGI Program, Summer 2021
The NSF Mathematical Sciences Graduate Internship Program pairs high-performing math PhD students with a mentor at a federal national laboratory or research facility. I worked with Matthew Coudron from the National Institute of Standards and Technology to create classical algorithms which simulate special classes of near-term quantum circuits. This was a 10 week internship and provided a stipend of $12,000.

GEMS Program, Summer 2015
GEMS is a competitive research program in the math department at the University of Delaware in which an undergradute student, a graduate student and a faculty member work as a team to tackle a problem. The program includes a $6,000 stipend.
- Worked to uncover properties of a family of algebraically defined directed graphs

Summer Scholars Program, Summer 2012/2013
The Summer Scholars program is a competitive undergraduate research program at the University of Delaware. The program includes a $3,500 stipend.
- Worked to progress open problems in additive combinatorics and extremal graph theory
- Presented and Discussed findings with colleagues at the Undergraduate Research and Service Celebratory Symposium

Independent Study, Spring 2013
- Researched interpolation formulas which produce polynomials with desirable behavior on elements not within the domain of the function being interpolated

Publications

- S. Dontha, S.J. Tan, S. Smith, S. Choi, M. Coudron, *Approximating Output Probabilities of Shallow Quantum Circuits which are Geometrically-local in any Fixed Dimension*, poster presentation Quantum Information Processing, 2022.
- É. Czabarka, S. Smith, L.A. Székely, *Maximum diameter of 3- and 4-colorable graphs*, to appear in J. Graph Theory.
- É. Czabarka, S. Smith, L.A. Székely, *An infinite antichain of planar tanglegrams*. Order (2021). *https://doi.org/10.1007/s11083-021-09563-6*

- É. Czabarka, T. Olsen, S. Smith, L.A. Székely, *Minimum Wiener index in triangulations and quadrangulations*, submitted to Discrete Applied Mathematics.
- A. Kodess, F. Lazebnik, S. Smith, J. Sporre. *Diameter of some monomial digraphs*. Contemporary Developments in Finite Fields and Applications, 2016, 160-178.
- C. Castillo, R.S. Coulter and S. Smith, *A note on interpolation of permutations of a subset of a finite field*, Bull. Austral. Math. Soc. **90** (2014), 213-219.

Presentations	**An Infinite Antichain of Planar Tanglegrams** Discrete Math Research Seminar University of South Carolina Sep 30 and Oct 14, 2021 **Simulating Classes of Low-Depth Quantum Circuits** NSF MSGI Summer Research Presentations Oak Ridge Institute for Science and Education Aug 12, 2021 **Is the Induced Subtanglegram Relation a Well Quasi Order?** Discrete Math and Combinatorics Seminar University of South Carolina Dec 4, 2020 **Lower Bounds for Algebraic Computation Trees** Discrete Math Research Seminar University of South Carolina Oct 17, Oct 24 and Oct 31, 2019
Conferences Attended	**Atlanta Lecture Series XXV** Georgia State University August 28-29, 2021 **Discrete Math Days** Williams College April 24-25, 2021 **Carolina Math Seminar** University of South Carolina November 2, 2018 **Algebraic and Extremal Graph Theory** University of Delaware August 7-10, 2017
Teaching Experience	**Instructor of Record, University of South Carolina, Columbia, SC** • Instructor for Math374 (Discrete Structures), Spring 2022 • Instructor for Math374 (Discrete Structures), Fall 2021 • Instructor for Math374 (Discrete Structures)[Online], Spring 2021 • Instructor for Math111 (College Algebra)[Online], Fall 2020 • Instructor for Math122 (Business Calculus), Spring 2020

- Instructor for Math115 (Precalculus), Fall 2019
- Instructor for Math142 (Calculus II), Summer 2019

Teaching Assistant, University of South Carolina, Columbia, SC
- TA for Math141 (Calculus I), Fall 2018 & Spring 2019

Instructor, Mathnasium, Middletown, DE, August 2017 - June 2018
- Guides students through individualized learning plans witihin the Mathnasium curriculum
- Provides supplemental material and assistance adhering to school curricula

Teaching Assistant, University of Delaware, Newark, DE
- TA for Math243 (Calculus III), Fall 2015
- TA for Math267 (An Integrated Approach to Calculus I), Spring 2016

Grader, University of Delaware, Newark, DE, Spring 2013
- Graded for Math302 - Ordinary Differential Equations

Service

- Organizer of the Discrete Math and Combinatorics Seminar at the University of South Carolina, 2021 - 2022
- Proctor for the annual USC High School Math contest, 2019 - 2020

Activities and Honors

- Breakthrough Graduate Scholars Award
  - Given annually to approximately one dozen graduate students at the University of South Carolina, this award recognizes excellence in the classroom and significant contributions to research in each student's discipline.
- Outstanding First-Year Graduate Student award, Spring 2019
  - Given annually by the Department of Mathematics at the University of South Carolina
- College of Arts & Sciences Graduate Stipend Enhancement Award, Fall 2018 - Spring 2022
  - Awarded an additional $16,000 over four years while completing my PhD at the University of South Carolina
- GAANN Fellowship, University of Delaware, Fall 2014 - Spring 2015
- Dean's list, University of Delaware, Fall 2010-Spring 2014
- Member of National Society of Collegiate Scholars

Coursework

Graduate Coursework

Vector Spaces	Combinatorics I, II
Algebra I, II	Real and Complex Analysis I, II
Probability Theory I	Theory of Stochastic Processes
Algorithms over Finite Fields	Combinatorial Optimization
Logic	Applied Math I
Numerical Linear Algebra	Galois Theory
Graph Theory I, II	Algorithms
Fourier Analysis	Analytic Number Thoery
Elliptic Curves	Quantum Information
Quantum Complexity Theory	

Languages   **Computer**

Proficient in Python and LaTeX.
Experience with Java, C++, Visual Basic, DrRacket, and HTML.

Areas of Interest   My research interests are primarily centered around discrete math and its applications. I find the crossover to other disciplines exciting and I am passionate about learning new things.