

# Stephen J. Smith

## Curriculum Vitae

### Contact Information

E-mail: [smithsj1719@gmail.com](mailto:smithsj1719@gmail.com)  
Personal Website: <https://smithsj1719.github.io/>  
GitHub Profile: <https://github.com/smithsj1719>

### 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 undergraduate 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 within 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 Theory
Elliptic Curves	Quantum Information
Quantum Complexity Theory	

**Languages****Computer**

Proficient in Python and L<sup>A</sup>T<sub>E</sub>X.

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.