Jason Saied

jjs435@scarletmail.rutgers.edu | 570-807-6227 | https://sites.math.rutgers.edu/ jjs435/

Education

Rutgers University—New Brunswick May 2022
PhD in Mathematics. GPA: 4.00. *New Brunswick, NJ*

Lafayette College May 2016
Bachelor of Science in Mathematics. Summa cum laude. Honors thesis. GPA: 3.99. *Easton, PA*

Research Interests

I am interested in **algebraic combinatorics**, **representation theory**, and the interactions between them. My recent projects focus on combinatorial formulas for SSV polynomials (a recent generalization of Macdonald polynomials) and vertex-algebraic proofs of generalized Rogers-Ramanujan identities.

Papers and Preprints

"A combinatorial formula for Sahi, Stokman, and Venkateswaran's generalization of Macdonald polynomials." To appear in Advances in Mathematics. arXiv:2006.15086

"A Littlewood-Richardson rule for SSV polynomials." In preparation.

"Initiation of a program to categorify "motivated proofs" of generalized Rogers-Ramanujan identities." (With A. Ginory, S. Kanade, and J. Lepowsky.) In preparation.

"Classification of eventually periodic subshifts." (With Benjamín Itzá-Ortiz, Meghan Malachi, Austin Marstaller, and Sara Underwood.) Indagationes Mathematicae, Volume 27, Issue 3 (2016), pages 868-878.

Selected Honors and Awards

Award for Research, AMS Rutgers Graduate Student Chapter May 2021
Award for Leadership, AMS Rutgers Graduate Student Chapter May 2020
Excellence Fellowship, Rutgers University School of Arts and Sciences 2016 – 2017, 2019 – 2020
Co-Valedictorian, Lafayette College May 2016

Other Projects

Quantum Computation Summer 2021 – present
NASA Ames Research Center *Mountain View, CA*

- Advised by Dr. Eleanor Rieffel
- Working on a research problem related to quantum computation. Work ongoing, publication expected

Wigner Functions for the Generalized Quantum Harmonic Oscillator Summer 2021
NASA Headquarters *Washington, D.C.*

- Advised by Dr. Nasser Barghouty and Pat Eblen
- Made progress toward classifying the Wigner functions satisfying certain conditions, generalizing the Wigner functions associated to the stationary states of the quantum harmonic oscillator

Erdős Institute SIG Project May 2021
Erdős Institute Data Science Boot Camp

- Using Keras, trained a neural net that predicts whether Reddit posts will get more than the median number of upvotes with 67% accuracy
- Used Github to collaborate on Python code with two other students

Programming Skills

Python: intermediate, used in several projects
Maple: proficient, 3 years of experience, used extensively in research
Java: intermediate, 2 courses taken (including Data Structures and Algorithms)

Selected Talks

Alcove Walk Formula for SSV Polynomials

- Virginia Tech Algebra Seminar (invited), Virginia Tech, November 2021
- Conference on Applications of Macdonald Polynomials (invited), Indian Institute of Science, July 2021
- Solvable Lattice Models Seminar (invited), Stanford University, April 2021
- Rutgers Lie Group/Quantum Mathematics Seminar (invited), Rutgers University, March 2021

Motivated Proofs of Rogers-Ramanujan-Type Identities and Representation Theory

- Graduate Combinatorics Seminar, Rutgers University, April 2021
- Lafayette College Mathematics Department Seminar (invited), Lafayette College, December 2019

Selected Teaching Experience

Instructor Summer 2018, Summer 2019
Rutgers University *New Brunswick, NJ*

- Designed and taught two six-week Linear Algebra (Math 250) courses

Teaching Assistant Fall 2017 – Spring 2021
Rutgers University *New Brunswick, NJ*

- Held recitations to review material, facilitate group work, and administer quizzes
- Worked with Math 151 (Calculus I), Math 152 (Calculus II), Math 250 (Linear Algebra), and Math 477 (Probability)

Instructor Summer 2018, Summer 2019
Rutgers Young Scholars Program *New Brunswick, NJ*

- Independently designed and implemented two week-long inquiry-based courses on graph theory for advanced high school students

Apprentice Instructor Summer 2017
MathILy *Bryn Mawr, PA*

- Designed and implemented inquiry-based lessons on combinatorics and linear algebra for advanced high school students
- Helped to create and assess student assignments
- Designed and taught two inquiry-based mini-courses on group theory and game theory

Various Undergraduate Teaching Positions August 2013 – May 2016
Lafayette College *Easton, PA*

- Teaching assistant for Calculus I (Math 161), Transition to Theoretical Mathematics (Math 290), Abstract Algebra I (Math 351), and Combinatorial Game Theory (Special Topics Course)
- Mentor, Lafayette Initiative for Malagasy Education, August 2013 – May 2014.

Selected Service and Leadership

Erdős Institute Invitations to Industry Seminar Series | *Graduate student lead* July 2021 - Present

- Assist with seminar that helps PhD students and postdoctoral researchers learn about industry and establish relationships with potential employers. Recruit speakers, hold preparatory meetings, and host the seminar

Rutgers Graduate Student–Faculty Liaison Committee | *Member* Spring 2018 – Present

- Plan open house for prospective PhD students, serve as liaison between mathematics faculty and students, hold events for graduate students

Rutgers Mathematics Department Directed Reading Program | *Co-coordinator* Spring 2018 – Present

- Pair undergraduates with graduate student mentors for semester-long independent study projects

Rutgers Graduate Algebra and Representation Theory Seminar | *Organizer* Fall 2019 – Spring 2021

QRST Conference | *Technical support* August 2020

- Assisted a conference organized by Hadi Salmasian and Siddhartha Sahi, providing Zoom support, creating and managing a gather.town discussion room, recording talks, and uploading videos to YouTube

Rutgers Graduate Student Pizza Seminar | *Co-organizer* Fall 2017 – Spring 2018