Alison "AJ" Bu

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Education

Rutgers University   New Brunswick, NJ
Ph.D. in Mathematics   *May 2024*
Concentration: Experimental Mathematics
Advisor: Doron Zeilberger
GPA: 3.87/4.00

Boston College   Chestnut Hill, MA
Bachelor of Arts - Mathematics; Philosophy Minor; magna cum laude   *May 2017*
GPA: 3.77/4.00; Major GPA: 3.75/4.00

Teaching Experience

Rutgers, The State University of New Jersey   New Brunswick, NJ
Instructor of Record   *Summer 2022, Summer 2023, Summer 2024*
- Taught Calculus II
- Created lecture schedules, lesson plans, ran lectures, and facilitated group learning
- Wrote and graded worksheets, quizzes, workshops, and exams

Rutgers, The State University of New Jersey   New Brunswick, NJ
Teaching Assistant   *Fall 2019-Spring 2020, Fall 2021, Fall 2022*
- Teaching assistant for Calculus I (Fall 2019, Fall 2021), Calculus II (Spring 2020), and Linear Algebra (Fall 2022)
- Ran recitations and workshops (both online and in-person): created lesson plans, reviewed material covered during lecture, and facilitated group learning
- Created worksheets and quizzes
- Graded workshops, quizzes, and exams

Newark Academy   Livingston, NJ
Instructor of Record   *June 2018-August 2018*
- Taught Algebra I during the summer session
- Created individualized lesson plans and graded tests

Newark Academy   Livingston, NJ
Substitute Teacher   *January 2018-August 2018*
- Planned and taught lessons as a per diem and long-term substitute
- Substituted Regular and honors level math courses (6th grade, Pre-Algebra, Algebra I, Geometry, Algebra II/Trigonometry, Precalculus, AB/BC Calculus, IB Math)
- Graded Tests

Self-Employed Tutor   *August 2017-August 2019*
- Tutored for algebra, geometry, precalculus, calculus, the SAT, and the ACT

Brighton High School Brighton, MA
Student Teacher *Spring 2015*
- Completed placement in urban school for one full school day per week
- Planned and taught lessons in Physics (Special Education) and Advanced Algebra classes
- Created handouts and worksheets to aid student learning and assess student understanding

The Stepping Stones School Roseland, NJ
Volunteer *Summer 2012, Summer 2013, Summer 2014*
- Assisted in classroom for students ages 5-9 with Down syndrome
- Instructed students in speech, sign language, reading, writing, and counting
- Observed and assisted in physical therapy and occupational therapy

The Winston School Short Hills, NJ
Full-Time Classroom Intern *May-June 2013*
- Assisted in classes grades 3-8 for students with language-based learning disabilities
- Taught students in grades 3-8 one-on-one in math, English, and science

Leadership & Mentoring Experience

Rutgers, The State University of New Jersey New Brunswick, NJ
Head Teaching Assistant *Summer 2023, Summer 2024*
- Served as a mentor and research for graduate students teaching a summer course
- Conducted teaching observations for graduate students and wrote a review for the math department
- Provided feedback and suggestions to the instructors during the semester

Rutgers GRADient New Brunswick, NJ
President *June 2020-May 2024*
- President of the LGBTQ+ professional and graduate student association at Rutgers University
- Made GRADient a recognized Graduate Student Organization

Spectrum Retreat Chestnut Hill, MA
Mentor *Spring 2017*
- Led, gave a talk, and facilitated group discussion on a formation retreat for LGBTQ students at Boston College

Pride Peers Chestnut Hill, MA
Mentor and Presenter *September 2014-May 2017*
- Mentored LGBTQ+ Boston College students in self-discovery and social, familial, academic, and LGBTQ+ issues
- Facilitated small group discussion and aided mentees in self-reflection and self-discovery
- Gave presentations and facilitated discussions in dorms and classes about gender identity and sexuality
- Trained by University Counseling Services, University Mission and Ministry, and the Dean of Students Office

Undergraduate Government of Boston College Chestnut Hill, MA
Coordinator (2015), Asst. Director of Gender Programming (2016) *Spring 2015-Spring 2016*
- Planned, organized, and implemented campus wide events that promote awareness on LGBTQ+ issues

Professional Development

Rutgers Math Teaching Group *September 2020-May 2024*
- Participated in weekly discussions on undergraduate teaching and pedagogical methods
- Led discussions on how to run workshops online and teaching a summer course

Research Experience

Rutgers, The State University of New Jersey New Brunswick, NJ
Thesis Research *June 2020-May 2024*
- Researched in Experimental Mathematics and Discrete Math under the guidance of Dr. Doron Zeilberger

Boston College Mathematics Department Chestnut Hill, MA
Undergraduate Research Fellow *Summer 2016*
- Researched computational algebraic number theory under Dr. Ellen Goldstein

Lynch School of Education, Boston College Chestnut Hill, MA
Research Assistant *Fall 2016*
- Researched educational testing with Dr. Michael Russell

Publications and Preprints

A. Bu. "Explicit Generating Functions for the Sum of the Areas Under Dyck and Motzkin Paths (and for Their Powers)." Discrete Math. Lett. 14 (2024). pp. 1-6.

A. Bu and D. Zeilberger. "Using Symbolic Computation to Explore Generalized Dyck Paths and Their Areas." Palest. J. Math. 13 (3) (2024). pp. 1-13.

A. Bu and D. Zeilberger. "Explicit Expressions for the First 20 Moments of the Area Under Dyck and Motzkin Paths." Preprint arXiv:2405.03079 (2024).

A. Bu "A Combinatorial Approach to the Groebner Bases of Ideals Generated by the Elementary Symmetric Functions." E-JC 29 (3) (2022). Article P3.4.

A. Bu and R. Dougherty-Bliss. "Enumerating Restricted Dyck Paths with Context-Free Grammars." Integers 21 (2021). Article 69.

A. Bu "Automated Counting of Restricted Motzkin Paths." ECA 1 (2) (2021). Article S2R12.

Talks

"Studying the Area under (Generalized) Dyck Paths." Rutgers Experimental Mathematics Seminar. (March 7, 2024).

"Enumerating Restricted Dyck Paths." New York Combinatorics Seminar. (November 5, 2021).

Awards and Honors

LGBTQIA Taskforce Award, Rutgers University *May 2024*

SAS Fellowship, Rutgers University *Fall 2020-Spring 2021, Spring 2023*

Janice Pattwell Annual Mathematics Fellowship, Rutgers University *Fall 2018*

Magna Cum Laude, Boston College *Spring 2017*

Departmental Honors, Boston College Mathematics Department *Spring 2017*

The Order of the Cross and Crown, Boston College *Spring 2017*

Dean's List: First Honors, Boston College (7 semesters)