Josiah Hudock

Athens, OH josiahghudock@gmail.com

EDUCATION

Master of Science in Mathematics Anticipated May 2027
Ohio University, Athens, OH
- *GPA*: 4.0/4.0

Bachelor of Arts May 2025
Washington & Jefferson College, Washington, PA
- *Majors:* Mathematics, Music.
- *Minor:* Religious Studies.
- *GPA*: 4.0/4.0

SELECTED ADVANCED COURSEWORK

Ohio University
- **Planned / In Progress:** Algebra I–II, Analysis I–II, Set Theory, Thesis Research.
- **Completed:** Point-Set Topology, Algebraic Topology, Complex Variables, Advanced Calculus I–II, Modern Algebra I–II. *(All grades: A)*

Washington & Jefferson College
- **Completed:** Introduction to Topology, Algebraic Structures, Real Analysis, Number Theory, Linear Algebra, Combinatorics, Probability & Statistics. *(All grades: A)*

RESEARCH PROJECTS

Characterization of 3-Foldable Words and Corresponding Plane Trees
- We investigate the mathematical process of wrapping words around a plane tree as a model for the process of RNA folding in molecular biology.
- A plane tree with n edges is w-valid for a word w of length $2n$ if it wraps around the tree such that each edge is labelled with a pair of complementary letters. A word w is k-foldable if the number of w-valid plane trees is k.
- Bjorkman et al. published a complete characterization of 2-foldable words. In our research, we utilize local moves and the connected state space graph to find a complete characterization of 3-foldable words.
- Our findings were presented at the 2024 Joint Mathematics Meetings.
- Our paper was published in Springer Nature Proceedings in Math and Statistics, (with F.C.C Doherty and Madison Ramsey).

Counting Connected Subsets of an $n \times 2$ Rectangular Grid
- Samuel Durham and Tom Richmond calculated the number of ways to partition an $n \times 2$ rectangular grid into 2 or 3 connected subsets.
- My work utilizes an alternative counting method to create a more general algorithm capable of counting the partitions of an $n \times 2$ rectangle into any number k connected subsets recursively.
- Presented closed-form expressions of formulas counting for small values of k.

PRESENTATIONS

- Counting Connected Subsets of an $n \times 2$ rectangle, Joint Mathematics Meeting, PME Contributed Session on Research by Undergraduates VIII, San Francisco (Jan 5, 2024).

- Platonic Solids and Euler Formula for Polyhedrons, Student Projects Poster Session, Washington & Jefferson College (May 9, 2022).
- Quandles as Matrices and Knot Invariants, Senior MathTalk Presentations, Washington & Jefferson College (Dec 10, 2024).

EXPERIENCE

Graduate Teaching Assistant Aug 2025 – Present
Ohio University, Athens, OH

- Instructor of record for undergraduate course sections in College Algebra (40 students), Precalculus (22 students), and Survey of Calculus (39 students).
- Create supplemental materials for instruction and review, as well as classroom activities for engagement and active learning.
- Hold weekly office hours to provide individualized academic support.

Student Grader Jan 2024 – May 2025
Washington & Jefferson College

- Reviewed students' homework submissions.
- Marked grades and provided instructional commentary on each assessment.
- Graded for Calculus I in Spring 2024, and Calculus II in Fall 2024.

Peer Assisted Learning Math Tutor Aug 2022 – Jan 2023
Washington & Jefferson College

- Provided academic support for math students at W&J.
- Worked with students one-on-one to address their individual needs in various math courses.

HONORS & AWARDS

- **Kaushalya Vati Graduate Support Fund**, Ohio University, May 2026.
  For exceptional performance within the mathematics program.
- **Valedictorian**, W&J College, May 2025.
- **Phi Beta Kappa**, May 2025.
- **Pi Mu Epsilon Mathematics Honors Society Chapter VP**, W&J College, Mar 2024.
- **Rule, Hughes, Murphy Award**, W&J College, Apr 2023.
  Institutional sophomore honor recognizing academic achievement, character, and service.
- **The Theodore M. Slabey Prize in Mathematics Education**, W&J College, Apr 2025.
  Institutional award for excellence in math education.
- **The Clyde Shepherd Atchison Prize**, W&J College, Apr 2025.
  Math departmental award.
- **Presidential Scholarship**, W&J College, Aug 2021 – May 2025.
  Merit-based undergraduate scholarship.