

Colby Shaw

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Education

Vanderbilt University, Ph.D. in Mathematics

August 2024-May 2029

Georgia Institute of Technology, B.S. in Mathematics
Minor in Computer Science: Computing and Intelligence

May 2024

GPA: 4.00

Publications

[1] **Unknotted Curves on Genus-One Seifert Surfaces of Whitehead Doubles**

Joint work with S. Dey, V. King, B. Tosun, B. Trace, *Pacific Journal of Mathematics*, **330** (2024), 123-156

Research Experience

Topology REU @ University of Alabama

May 2022 – August 2023

- Conducted research in low-dimensional topology and knot theory under the mentorship of Bülent Tosun
- Characterized homologically essential simple closed curves on genus one Seifert surfaces that are unknotted in the 3-sphere for almost all twist knots

Independent Research – Georgia Institute of Technology

May 2023 – August 2023

- Developed Random Dynamical Systems package in Julia, advsed by Alex Blumenthal
- <https://github.com/colbyshaw/RandomDynamics.jl>

Polymath Jr. REU Program

June 2021 – August 2021

- Studied new bounds in extremal combinatorics under the mentorship of Pat Devlin, of Yale University
- Applied intersecting hypergraphs and combinatorics to find upper bound of permutation families with subsequence restriction for special cases

Teaching

Vanderbilt University

Calculus Tutor

August 2024 – April 2025

Georgia Institute of Technology

PLUS Leader

July 2021 – July 2022

- Lead group study sessions twice a week for MATH 2106 (Proofs) and MATH 1553 (Linear Algebra)
- Partnered with School of Mathematics and Tutoring Department to create group study plans for 500+ undergraduate students to supplement learning outside of class
- Operated with team to maintain teaching/tutoring efficiency both in-person and virtually

Princeton Academy – Johns Creek, Georgia

June 2023– July 2024

- Taught a summer SAT math course consisting of around 30 students
- Created and implemented lesson plans involving lectures, classwork, and homework
- Tutor 1-on-1 for geometry and calculus both in-person and virtually

Presentations

Georgia Tech Summer Research Poster Session. Poster by Colby Shaw and Veronica King. *Unknotted Curves on Seifert Surfaces*

Conferences Attended

- Georgia Topology Conference 2023
- SEC Topology Conference 2023

Skills

Computer Concepts: Data Structures, Object-Oriented Programming, Dynamic Programming, Sorting Algorithms, Graph Algorithms, Reinforcement Learning, Q-learning, Neural Networks, Artificial Intelligence, Machine Learning

Computer Languages: C, ARM Assembly, Java, Python, CSS, HTML, Julia

Soft Skills: Leadership, Personable, Communication, Time Management, Self-Teaching, Disciplined, Teaching

Music: Georgia Tech Marching Band, classical clarinet