

RUSHIL RAGHAVAN

(310) · 733 · 6321 ◊ rushil.raghavan@gmail.com ◊ rushil.online

EDUCATION

The Ohio State University

B.S. in Honors Mathematics, Minor in Quantitative Economics

May 2021 (expected)

GPA: 3.921 Math GPA: 3.947

PREPRINTS

V. Bergelson, J. Hury, and R. Raghavan, *Discordant Sets and Ergodic Ramsey Theory*. [[arXiv:2011:14515](https://arxiv.org/abs/2011.14515)]
Submitted to *l'Enseignement Mathématique*.

R. Raghavan and D. Sweeney, *Regular Isotopy Classes of Link Diagrams From Thompson's Groups*. [[arXiv:2008:11052](https://arxiv.org/abs/2008.11052)] Submitted to *Algebraic & Geometric Topology*.

G. Brown, A. Mitchell, R. Raghavan, J. Rogge, and M. Scheepers, *Classifying Permutations Under Context-Directed Swaps and the cds Game*. [[arXiv:2011.00706](https://arxiv.org/abs/2011.00706)]

RESEARCH EXPERIENCE

Discordant Sets and Ergodic Ramsey Theory

Spring 2019 - Present

Advisor: Vitaly Bergelson

The Ohio State University

- Studying a historically interesting class of subsets of amenable groups (traditionally, the integers) called *discordant sets*, which have positive density but are not piecewise syndetic
- Exploring the combinatorial and dynamical properties of such sets and their relationship with the theorems of Szemerédi and van der Waerden on arithmetic progressions

Regular Isotopy Classes of Link Diagrams From Thompson's Groups

Summer 2020

Advisor: Sergei Chmutov

Knots and Graphs Working Group, The Ohio State University

- Characterized the regular isotopy classes of link diagrams that arise as coefficients from certain unitary representations of Thompson's groups, answering a question posed by Vaughan Jones in 2018.
- Presented at the 2020 Young Mathematicians Conference at Ohio State University August 2020

Context-Directed Swaps and a Permutation Sorting Game

Summer 2019

Advisor: Marion Scheepers

Boise State University Mathematics REU

- Studied the dynamics of a permutation-sorting operation motivated by cell biology called cds
- Classified permutations which are "extreme" with respect to cds
- Developed new winning strategies in a combinatorial game related to cds
- Conference Presentations:

Idaho Conference on Undergraduate Research, Boise State University

July 2019

Young Mathematicians Conference, Ohio State University

August 2019

Joint Mathematics Meetings Student Poster Session

January 2020

Symmetric Chromatic Function for Signed Graphs

Summer 2018

Advisor: Sergei Chmutov

Knots and Graphs Working Group, The Ohio State University

- Generalized Stanley's Symmetric Chromatic Function to Signed and Voltage Graphs
- Generalized formulas related to the Symmetric Chromatic Function in this setting
- Worked to verify Stanley's Tree Conjecture for some classes of trees

· Conference Presentations:

Young Mathematicians Conference, Ohio State University, August 2018

Midwest Graph Theory Conference, Ohio State University at Marion, October 2019

SEMINAR TALKS

Talks given at the “Reading Classics” Seminar at OSU

“The Weierstrass Approximation Theorem” February 2019

“Pitfalls in Proving the Fundamental Theorem of Algebra” October 2019

“The Transcendentality of Pi” February 2020

“The Isoperimetric Problem” September 2020

Miscellaneous additional talks

“The Sum-Product Phenomenon and Solymosi’s Theorem”, a talk I gave to “Introduce Myself” at the Boise State Mathematics REU June 2019

“Sort Like a Ciliate: Solutions and Strategies in a Genomic Game”, Interdisciplinary Forum on STEM, Boise State University July 2019

EMPLOYMENT, ACTIVITIES, SKILLS

Employment

- Teaching Assistant for Math 1130 (College Algebra for Business) at OSU Spring 2021
- Teaching Assistant for Math 1150 (Precalculus) at OSU Autumn 2020
- Mentor and Grader for Math 4182H (Honors Analysis II) at OSU Spring 2020
- Teaching Assistant for Math 1148 (College Algebra) at OSU Autumn 2019
- Tutor at the Ohio State Mathematics and Statistics Learning Center Autumn 2018
- Tutor, Varsity Tutors LLC Summer 2018-Spring 2019

Competitions

- 2018 Putnam Exam Score: 32 points, Rank 331.5/4623
Solution to problem B2 published in the *American Mathematical Monthly*’s annual Putnam article
- 2019 Putnam Exam Score: 27 points, Rank 344.5/3428
- 2019 OSU ACM Programming Contest First Place, with Ankan Bhattacharya and Dennis Sweeney
- 2019 OSU Integral Bowl First Place, with Ankan Bhattacharya and Dennis Sweeney
- 2020 Gordon Mathematics Competition Third Place

Skills

Proficient in \LaTeX , comfortable with programming languages like Python and Java