

Curriculum Vitae
Sohail Farhangi
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Citizenship Status: U.S. Citizen

Email: sohail.farhangi@gmail.com

Professional Website: sohailfarhangi.com

Research Interests:

- Ramsey Theory
- Ergodic Theory and Dynamical Systems
- Theory of Uniform Distribution

Education:

- Thomas Jefferson High School of Science and Technology, Advanced Studies Diploma, June 2013.
- Virginia Polytechnic Institute and State University, B.S. in mathematics, December 2015.
- Virginia Polytechnic Institute and State University, M.S. in mathematics, December 2016.
 - *Thesis Advisor:* Ezra Brown
 - *Thesis:* [On Refinements of Van der Waerden's Theorem](#)
- The Ohio State University, Ph.D. in mathematics, Spring 2022 (anticipated)
 - *Thesis Advisor:* Vitaly Bergelson
 - *Thesis:* The prevalence of nearly mixing sequences in ergodic theory.

Awards and Honors:

- High School
 - Participated in the USA Mathematical Talent Search 4 times from the Fall of 2008 until the Spring of 2013. I received 3 Honorable Mentions, and 1 Bronze Medal.
 - Bronze medal in the 2012 National Mexican Math Olympiad. This resulted in a Washington Post article entitled "[Fairfax County high school student tests his math prowess in Mexico](#)".
 - Qualified for the 2013 USA Math Olympiad and received a honorable mention with a score of 28/42. This resulted in me being part of a 6-way tie for spots 13-18 in the nation.
 - Received 2nd place in the senior division of the 2013 [Sharygin Geometry Olympiad](#), which is a Russian high school math contest that is also open to participants from other countries.
 - Contributed to the collection of math at www.cut-the-knot.org
 - Expository Articles
 - * [Existence of the Exeter Point](#)
 - * [On Sawayama Thebault's Theorem](#)
 - Original Works
 - * [Centroids and Circumcenters](#)
- Virginia Tech, August 2013 - May 2016
 - Highest score at Virginia Tech on the Putnam Exam in 2013, 2014, and 2015.
 - Highest score at Virginia Tech on the Virginia Tech Regional Math League in 2013, 2014, and 2015.
 - Received a successful participation in the Math Contest in Modeling in 2014, and an honorable mention in 2015.
 - Acknowledged in the preface of "Ramsey Theory on the Integers" 2nd edition by Bruce Landman and Aaron Robertson.
 - Received The T. W. Hatcher Math Scholarship for the 2014-2015 academic year.
 - Received The Lee R & Regina A Steeneck Scholarship for the Fall of 2015.
- The Ohio State University, August 2016 - Spring 2022
 - Received a Distinguished First-Year Graduate Teaching Associate Award from The Ohio State University Math Department, Spring 2018.
 - Received a Special Graduate Assignment (SGA) graduate research fellowship from The Ohio State University Math Department, Spring 2019.
 - Selected as a finalist for the Graduate Teaching Associate Award from The Ohio State University Math Department, Spring 2020.

- Selected as a finalist for the Graduate Teaching Associate Award from The Ohio State University Math Department, Spring 2021.

Publications:

- 1 [Pointwise Ergodic Theorems For Higher Levels Of Mixing](#), *Studia Math.*, 261(3):329–344, 2021.
– <https://arxiv.org/abs/2107.07861>
- 2 [Distance Graphs and Arithmetic Progressions](#) (joint work with [J. Grytczuk](#)), *Integers*, 21A(Ron Graham-Memorial Volume):Paper No. A11, 6, 2021.

Preprints:

- 3 Enhancements of van der Corput’s Difference Theorem and Connections to the Hierarchy of Mixing Properties of Unitary Operators, Submitted
– <https://arxiv.org/abs/2106.01123>
- 4 Classifying Partition Regular Polynomial Equations in a Nonlinear Family (joint work with [R. Magner](#)), Submitted
– <https://arxiv.org/abs/2105.02190>

Conferences Attended and Talks Given:

- (1) Attended MAA MathFest, Washington Marriott Wardman Park, Washington, DC, VA, USA (August 5-8 2015)
- (2) Attended the Joint Mathematics Meetings, Washington State Convention Center, Seattle, WA, USA (January 6-9 2016)
 - Gave a Talk on the 2-Large is Large conjecture.
- (3) Gave 3 talks at [the OSU What is seminar](#).
 - [What is... an Engel Series?](#), Summer 2017.
 - [What is... The continued fraction factoring method?](#), Summer 2018.
 - [What are... some nice conjectures in graph theory?](#), Summer 2020.
- (4) Gave multiple talks at the Ergodic Theory and Combinatorial Number Theory (ET&CNT) Student Seminar, some of which are listed below. I was also an organizer of this seminar from Fall 2019 until Spring 2022.
 - The canonical Rado Theorem and the canonical (m, p, c) -set Theorem, Fall 2016.
 - Powers of sequences and recurrence, Spring 2016.
A two part talk about [this](#) paper and my generalization of one of their results.
 - Topological versions of van der Corput’s Difference Theorem, Spring 2019.
 - Pointwise Ergodic Theorems for Higher Levels of Mixing, Fall 2019.
A two part talk about my work in [1](#).
 - Van der Corput’s Difference Theorem and the Ergodic Hierarchy of Mixing Properties, Fall 2020.
A three part talk about my work in [3](#).
 - Nonlinear Rado Conditions, Spring 2021.
A four part talk about [this](#) paper with a brief discussion about how I used it in [4](#). A video recording of these talks starting with part 1 can be found [here](#).
 - Exponential Patterns in Ramsey Theory, Fall 2021.
A two part talk about the recent work of J. Sahasrabudhe in [this](#) paper.
- (5) Attended the [Combinatorial and Additive Number Theory \(CANT\) Online Conference](#) (May 24-28, 2021)
 - My collaborator [R. Magner](#) gave a talk about our joint work on [4](#).
- (6) Gave an invited zoom talk at the [Descriptive Dynamics and Combinatorics Seminar at McGill University](#) about my work in [3](#).

Teaching Experience¹:

- Leader of the Thomas Jefferson High School USA Math Olympiad Training Sessions, September 2012 - June 2013.
- Have provided over 20 hours of lectures to the Fairfax Math Circle, September 2011 to May 2015.

¹See sohailfarhangi.com for the notes and handouts that I have produced for some of the classes that I have TAed.

- Leader of the Virginia Tech Putnam Training Sessions, Fall 2014.
- Grader and counselor at the ROSS Mathematics Program (in Columbus Ohio), Summer 2015.
- Worked as a tutor for 12 hours a week at the Virginia Tech Math Emporium, Spring 2016.
- Grader and counselor at the China ROSS Mathematics Program (in Nanjing China), Summer 2016.
- Assisted with exam creation and grading for the OSU [Rasor-Bareis-Gordon Competition](#).
- The Ohio State University
 - (1) Teaching Assistant for calculus 1 (Math 1151), Fall 2017.
 - (2) Teaching Assistant for calculus 2 for engineers (Math 1172), Spring 2018 and Fall 2018.
 - (3) Teaching Assistant for college algebra (Math 1148), Summer 2018.
 - (4) Teaching Assistant for multivariable calculus (Math 2153), Summer 2019.
 - (5) Teaching Assistant for precalculus (Math 1150), Fall 2019.
 - (6) Teaching Assistant for mathematical topics for engineers (Math 2173), [Spring 2020](#).
 - (7) Grader² for ordinary differential equations (Math 2255), [Summer 2020](#).
 - (8) Teaching Assistant for mathematical topics for engineers (Math 2173), [Fall 2020](#).
 - (9) Teaching Assistant for engineering mathematics B (Math 2177), [Spring 2021](#).
 - (10) Worked at the [Buckeye Aha Math Moments \(BAMM\)](#) program, Summer 2021.
 - (11) Teaching Assistant for Calculus III (Math 2153), [Fall 2021](#).

²My official assignment by the university was to be a grader, but I decided to hold recitations and be a teaching assistant instead as demonstrated by my notes for this course that are available on sohailfarhangi.com.