Rayan K. Ibrahim

https://raymaths.github.io

CONTACT INFORMATION	Grace E. Harris Hall, Fourth Floor 1015 Floyd Ave. Box 842014 Richmond, Virginia 23284-2014

EDUCATION

Ph.D. Systems Modeling and Analysis — May 2024 (Expected)
Concentration in Discrete Mathematics
- Advisors: Craig E. Larson & Allison H. Moore
- Virginia Commonwealth University, Richmond, VA

M.S. Mathematics — May 2021
- Virginia Commonwealth University, Richmond, VA

B.S. Mathematics — Jan. 2019
- The City University of New York,
  The College of Staten Island, Staten Island, NY
- The Verrazzano School - Undergraduate Honors Program

RESEARCH EXPERIENCE

Graduate Research Assistant, Virginia Commonwealth University — Aug. 2021 – Present
- Funded by: National Science Foundation DMS–2204148, &
  The Thomas F. and Kate Miller Jeffress Memorial Trust,
  Bank of America, Trustee,
- Topology, Knot Theory, Graph Theory, Combinatorics
- Supervisor: Allison H. Moore, PhD

Undergraduate Research Assistant, The College of Staten Island — Feb. 2017 – Jun. 2019
- Funded by: Grants from The Gulf of Mexico Research Initiative
  to the Consortium for Advanced Research on Transport of
  Hydrocarbon in the Environment (CARTHE)
- Oceanography, Data Processing
- Supervisor: Andrew C. Poje, PhD

REU in Mathematics, Hobart and William Smith Colleges — May 2018 – Aug. 2018
- Funded by: National Science Foundation DMS–1757616
- Graph Theory
- Supervisor: Erika L.C. King, PhD

TEACHING EXPERIENCE

Instructor of Record, Virginia Commonwealth University
- Introduction to Contemporary Mathematics — Sm20
- Algebra with Applications — F20
- Precalculus — Sm21, Sm22, Sm23
- Calculus I — F23

Graduate Teaching Assistant, Virginia Commonwealth University — F19, Sp20, Sp21
- Grader: Basic Practice of Statistics, Mathematical Modeling, Precalculus
- Classroom Assistant: Precalculus

Mathematics Tutor — Sep. 2016 – Dec. 2018
- The College of Staten Island
- Courses: Remedial Mathematics, Calculus I, II, & III (Multivariate), Probability,
  Calculus Lab (MATLAB)

Mathematics Tutor, Website Designer — Jul. 2017 – Aug. 2017

- The College of Staten Island,
  The Verrazzano Honors School and
  Macaulay Honors College
- Funding provided by NYC DYCD Summer Youth Employment Program

PUBLICATIONS

1. E. King, **R. Ibrahim**, R. Jackson. (2022) Introducing 3-Path Domination. *Journal of Combinatorial Mathematics and Combinatorial Computing.*

2. M. Berta, A. Griffa, A. C. Haza, J. Horstmann, H. S. Huntley, **R. Ibrahim**, B. Lund, T. M. Özgökmen, A. C. Poje. (2020) Submesoscale Kinematic Properties in Summer and Winter Surface Flows in the Northern Gulf of Mexico. *Journal of Geophysical Research: Oceans*, 125

3. M. Elpers, **R. Ibrahim**, A. H. Moore. Determinants of Simple Theta Curves. *Under Review.*

4. **R. Ibrahim**, H. Lafayette, K. McCall. Bootstrap Percolation, Connectivity, and Graph Distance. *In Preparation.*

5. V. Bednar, Y. Bidav, N. Bushaw, C. Flippen, M. D. Gibellato, **R. Ibrahim**, C. E. Larson, R. Wieman. Notes on Hadamard Matrix Graphs. *In Preparation.*

6. **R. Ibrahim**, A. H. Moore, P. Liu. Clique Complexity of RNA Pseudoknots. *In Preparation.*

PRESENTATIONS

1. R. Ibrahim. Determinants of Simple Theta Curves. Joint Mathematics Meetings, AMS Contributed Paper Session on Topology. (Jan. 2023)

2. R. Ibrahim. The Structure of Graphs With Independence Number 2. Virginia Commonwealth University Discrete Mathematics Seminar. (Feb. 2022)

3. R. Ibrahim. The Reconstruction Problem. Virginia Commonwealth University SYSM Research Seminar. (Feb. 2021)

4. E. King, **R. Ibrahim**, R. Jackson. Introducing 3-Path Domination. Presented at
   - National Technical Institute for the Deaf, Rochester Institute of Technology. (Jul. 2018)
   - MAA MathFest 2018 Undergraduate Sessions. (Aug. 2018)
   - The Ohio State University Young Mathematicians Conference 2018. (Aug. 2018)

OUTREACH

Geometry Summer Camp   Jun. 12 – 16, 2023
- Volunteer position.
- Guided middle school students through interactive mathematics activities and demonstrations.

OTHER ACTIVITIES

Student Geometry Workshop
- Virginia Commonwealth University

AMS Math Research Community   Jun. 5 – 11, 2022
Trees in Many Contexts *(Selected)*
- Week-long workshop with funding from the AMS and National Science Foundation DMS–1641020.
- Advised by Stephan Wagner on inverse problems on trees.

Graph Theory Computational Discovery Lab   May 2022, May 2023
- Virginia Commonwealth University
- Annual research workshop with a focus on discrete mathematics and generating conjectures via automated conjecturing (The Graph Brain Project).
- Topics Explored: Graphs, Knots, and Independence (2022), Hadamard Matrices (2023).

The Discrete MathemaTea   Aug. 2022 – Present
- Virginia Commonwealth University
- An informal, student led discussion group on current research.

- Co-organizer with Neal Bushaw and presenter.

Math and Magic with Manjul Minicourse   Sep. 2018 – Dec. 2018
- National Museum of Mathematics, New York, NY
- Participant in a minicourse involving magic tricks and the math behind them.

Math Club   Aug. 2017 – May 2018
- The College of Staten Island
- President and Event Organizer

Computer Science Club   Sep. 2016 – May 2018
- The College of Staten Island
- Member

Awards and Scholarships		
Albert V. Maniscalco Memorial Scholarship	Jan. 2018 – May 2018
Albert & Jean Roland Memorial Scholarship	Aug. 2017 – May 2018
New York State Academic Excellence Scholarship	Aug. 2015 – Jan. 2019
New York City Council Merit Scholarship	Aug. 2015 – Jan. 2019

Technical Skills		
Programming:	Matlab, Python, SageMath
Markup:	LaTeX, HTML, CSS, Word, Excel
Operating Systems:	Windows, Linux