Hunter D. Rehm

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Objective

Doctoral student in pure mathematics looking for an internship to expand my experience with applications.

Education

Ph.D., Mathematical Sciences, University of Vermont - Anticipated 2023
Selected coursework:

- Probabilistic Combinatorics
- Random Networks
- Matroid Theory
- Combinatorial Optimization
- Algebraic Topology
- Algebraic Geometry

B.Sc., Mathematics, Computer Science minor, University of Wisconsin-La Crosse - 2018
Selected coursework:

- Linear Algebra and Differential Equations
- Abstract Algebra I and II
- Real and Fourier Analysis
- Point-Set and Algebraic Topology
- Graph Theory
- Probability and Statistics
- Software Design I, II, and III
- Theory of Computation

Publications

K. Fallon, C. Giles, H. Rehm, S. Wagner, and N. Warnberg, Rainbow numbers of [n] for $\sum_{i=1}^{k-1} x_i = x_k$, Austral. J. Combin., 77(1), (2019), 1-8.

H. Rehm, A. Schulte, and N. Warnberg, Anti-van der Waerden numbers on graph products, Austral. J. Combin. 73(3), (2018), 486-500.

Coding Languages

- Python
- Java
- SageMath
- R
- JavaScript
- Manim (Mathematical Animation)

Teaching

Graduate Teaching Assistant, UVM Department of Mathematics and Statistics, 2018 - present

- *Instructor of record for 6 courses* (college algebra and calculus) with class sizes in the range 25-50.

Graduate Research

Graduate Student Researcher, UVM, Department of Mathematics and Statistics, 2018 - present

- *Boundary Detection in Random Geometric Graphs.* Developing a new algorithm to find the boundary of a geometric graph embedded in n-dimensional space. Manuscript in progress.
- *Graph Saturation.* Investigating the least number of edges in a graph G so that the addition of any edge creates H as a subgraph. We look at how the constraint that G is H-free affects this number.
- *2020 MASAMU Advanced Study Institute and Workshops in Mathematical Sciences.* One of 20 mathematicians accepted to a 2-week graph theory workshop. Currently participating in an international collaboration with graduate students to find an algorithm for constructing graphs with a specified radius, diameter, and center.
- *Research mentor* to 3 undergraduate students at UWL on projects led by Prof. Nathan Warnberg.
- *Presented at 6 conferences* (all of which were funded) including at the Joint Mathematics Meetings and the 50th Southeastern International Conference on Combinatorics, Graph Theory & Computing.

Undergraduate Research

Undergraduate Research Assistant, UWL, Department of Mathematics and Statistics, 2015 - 2018

- *Rainbow Numbers.* Studied colorings of $1, \ldots, n$ that guarantee coloring $\sum_{i=1}^{k-1} x_i = x_k$ distinctly. Found the exact number for $k = 3$, proved using the binary expansion of n. Project funded for 15 weeks.
- *Anti-van der Waerden numbers.* Studied the number of colors needed to color the vertices of a graph to guarantee coloring certain patterns distinctly. Proved a new upper bound for graph products. Project funded for 12 weeks.
- *Machine learning for the prediction of the outcome of endovenous laser ablation.* REU held at the California State University, Fresno in summer 2016. Compared a new Bayesian logistic model to existing linear models and showed that it performed better at predicting surgical outcomes using Monte Carlo cross-validation. Project funded for 8 weeks.