**Hanmeng (Harmony) Zhan**

CONTACT INFORMATION

Department of Combinatorics and Optimization
University of Waterloo
200 University Ave W, Waterloo, ON N2L 3G1

h3zhan@uwaterloo.ca
519-888-4567 ×37813
hanmengzhan.com

RESEARCH INTERESTS

Algebraic Graph Theory, Spectral Graph Theory, Quantum Walks, Quantum Information

EDUCATION

**University of Waterloo**, Waterloo, ON, Canada

- Ph.D. Student — May 2014 - Present
  Department of Combinatorics and Optimization, Faculty of Mathematics
  Supervisor: Chris Godsil
- Master of Mathematics — Sept 2012 - Apr 2014
  Department of Combinatorics and Optimization, Faculty of Mathematics
  Thesis: *Uniform Mixing on Cayley Graphs over* $\mathbb{Z}_3^d$
  Supervisor: Chris Godsil
- Bachelor of Arts — Jan 2010 - Aug 2012
  Department of Economics, Faculty of Arts
  Thesis: *Second-Price Auction with Resale*
  Supervisor: Philip Curry

**Xiamen University**, Xiamen, Fujian, China

- Bachelor of Economics — Sept 2008 - Jun 2014
  Department of Statistics, Faculty of Economics
  Thesis: *Multi-Player Multi-State Quantum Games*
  Supervisor: Zhengming Qian

PUBLICATIONS

**Journal Publications**

1. G. Coutinho, C. Godsil, M. Shirazi, H. Zhan, *Equiangular Lines and Covers of the Complete Graph. Equiangular Lines and Covers of the Complete Graph.* Linear Algebra and its Applications (2016) 488: 264-283.
2. R. Alvir, S. Dever, B. Lovitz, J. Myer, C. Tamon, Y. Xu, H. Zhan. *Perfect State Transfer in Laplacian Quantum Walk.* Journal of Algebraic Combinatorics (2016) 43(4): 801-826.
3. C. Godsil, H. Zhan, *Uniform Mixing on Cayley Graphs.* Electronic Journal of Combinatorics (2017) 24(3): P3.20.

**Preprints**

4. C. Godsil, H. Zhan, *Discrete-Time Quantum Walks and Graph Structures.* arXiv: 1701.04474 (2017).
5. H. Zhan, *An Infinite Family of Circulant Graphs with Perfect State Transfer in Discrete Quantum Walks.* arXiv:1707.06703 (2017).
6. G. Coutinho, C. Godsil, K. Guo, H. Zhan, *A New Perspective on the Average Mixing Matrix.* arXiv:1709.03591 (2017).
7. H. Zhan, *Quantum Walks on Embeddings.* arXiv:1711.08831 (2017).

8. A. Chan, G. Coutinho, C. Tamon, L. Vinet, H. Zhan, *Quantum Fractional Revival on Graphs.* arXiv:1801.09654 (2018).

## Presentations

### Conference Talks

1. *Graph covers and equiangular frames.* In: AMS Sectional Meeting, Ohio State University, Columbus, OH, United States, March 16 - 18, 2018.
2. *Discrete-Time Quantum Walks and Graph Embeddings.* In: CMS Winter Meeting, University of Waterloo, Waterloo, ON, Canada, December 8 - 11, 2017.
3. *Quantum Walks and Mixing.* In: Algebraic and Extremal Graph Theory, University of Delaware, Newark, DE, United States, August 7 - 10, 2017.
4. *Discrete-Time Quantum Walks and Graph Structures.* In: Canadian Discrete and Algorithmic Mathematics Conference, Ryerson University, Toronto, ON, Canada, June 12 - 15, 2017.
5. *From Covers to Tight Frames.* In: AMS Sectional Meeting, College of Charleston, Charleston, SC, United States, March 10 - 12, 2017.
6. *Spectra of Discrete Quantum Walks.* In: CMS Summer Meeting, University of Alberta, Edmonton, AB, Canada, June 24 - 27, 2016.
7. *Lines and Covers of Complete Graphs 2.* In: Systems of Lines: Applications of Algebraic Combinatorics, Worcester Polytechnic Institute, Worcester, MA, United States, August 10 - 14, 2015.
8. *Uniform Mixing in Continuous-Time Quantum Walks.* In: Summer Combo, Saint Michael's College, Burlington, VT, United States, July 21, 2015.
9. *Uniform Mixing in Quantum Walks.* In: 22nd Ontario Combinatorics Workshop, York University, Toronto, ON, Canada, May 16 - 17, 2014.

### Invited Talks

10. *Some Open Problems in Uniform Mixing.* In: Summer Research Program, Clarkson University, Potsdam, NY, United States, July 20, 2015.

## Working Experience

- Journal Reviewer

  Discrete Mathematics, Linear Algebra and Its Applications, Electronic Journal of Combinatorics ICALP
- Instructor

  Algebra for Honors Mathematics
- Teaching Assistant

  Algebraic Enumeration, Algebraic Graph Theory, Calculus, Coding Theory, Introduction to Graph Theory, Graph Theory, Introduction to Combinatorics, Linear Algebra, Portfolio Optimization Models, Special Topics in Mathematical Connections
- Research Assistant

  Continuous and Discrete Quantum Walks, Uniform Mixing, Periodic Vertices

## Awards and Distictions

**University of Waterloo**

- Outstanding Achievement in Graduate Studies 2015
- Cotton Family Women in Mathematics Graduate Scholarship 2014, 2016, 2017
- Faculty of Arts Upper-Year Scholarship 2011-2012
- Robin K. Banks Scholarship 2011-2012
- Dean's Honours List 2011-2012