

# Hanmeng (Harmony) Zhan

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

### Invited Talks

9. *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
- 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