

## Hanmeng (Harmony) Zhan

CONTACT INFORMATION	Centre de Recherches Mathématiques Université de Montréal, P.O. Box 6128 Centre-ville Station, Montréal, QC, H3C 3J7	zhanhanm@crm.umontreal.ca 514-343-7501 hanmengzhan.com
RESEARCH INTERESTS	Algebraic Graph theory, Orthogonal Polynomials, Quantum Walks, Quantum Information, Equiangular Lines	
CURRENT POSITION	<b>Centre de Recherches Mathématiques</b> , Montréal, QC, Canada • Postdoctoral Fellow Supervisor: Luc Vinet	Oct 2018 - Present
EDUCATION	<b>University of Waterloo</b> , Waterloo, ON, Canada  • Ph.D. May 2014 - Sept 2018 Department of Combinatorics and Optimization, Faculty of Mathematics Thesis: <i>Discrete Quantum Walks on Graphs and Digraphs</i> Supervisor: Chris Godsil  • Master of Mathematics Sept 2012 - Apr 2014 Department of Combinatorics and Optimization, Faculty of Mathematics Thesis: <i>Uniform Mixing on Cayley Graphs over <math>\mathbb{Z}_3^d</math></i> Supervisor: Chris Godsil  • Bachelor of Arts Jan 2010 - Aug 2012 Department of Economics, Faculty of Arts Thesis: <i>Second-Price Auction with Resale</i> Supervisor: Philip Curry  <b>Xiamen University</b> , Xiamen, Fujian, China  • Bachelor of Economics Sept 2008 - Jun 2014 Department of Statistics, Faculty of Economics Thesis: <i>Multi-Player Multi-State Quantum Games</i> Supervisor: Zhengming Qian	
PUBLICATIONS	<b>Journal Publications</b>  1. A. Chan, G. Coutinho, C. Tamon, L. Vinet, H. Zhan, <i>Quantum Fractional Revival on Graphs</i> . arXiv:1801.09654 (2018). Accepted to Discrete Applied Mathematics.  2. G. Coutinho, C. Godsil, K. Guo, H. Zhan, <i>A New Perspective on the Average Mixing Matrix</i> . Electronic Journal of Combinatorics (2018) 25(4): P4.14.  3. C. Godsil, H. Zhan, <i>Uniform Mixing on Cayley Graphs</i> . Electronic Journal of Combinatorics (2017) 24(3): P3.20.  4. G. Coutinho, C. Godsil, M. Shirazi, H. Zhan, <i>Equiangular Lines and Covers of the Complete Graph. Equiangular Lines and Covers of the Complete Graph</i> . Linear Algebra and its Applications (2016) 488: 264-283.	

5. 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.

## Preprints

6. C. Godsil, H. Zhan, *Discrete-Time Quantum Walks and Graph Structures*. arXiv:1701.04474 (2017). Submitted.
7. H. Zhan, *An Infinite Family of Circulant Graphs with Perfect State Transfer in Discrete Quantum Walks*. arXiv:1707.06703 (2017). Submitted.
8. H. Zhan, *Quantum Walks on Embeddings*. arXiv:1711.08831 (2017).

## PRESENTATIONS **Invited Talks**

1. *Some Open Problems in Discrete Quantum Walks*. In: Algebraic Graph Theory and Quantum Walks, University of Waterloo, Waterloo, ON, Canada, April 23 - 27, 2018.
2. *Recent Progress in Discrete Quantum Walks*. In: AMS Sectional Meeting, Northeastern University, Boston, MA, United States, April 21 - 22, 2018, 2018.
3. *Graph covers and equiangular frames*. In: AMS Sectional Meeting, Ohio State University, Columbus, OH, United States, March 16 - 18, 2018.
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. *Some Open Problems in Uniform Mixing*. In: Summer Research Program, Clarkson University, Potsdam, NY, United States, July 20, 2015.

## Conference Talks

1. *Combinatorial Aspects of Quantum walks*. In: Prairie Discrete Math Workshop, Brandon University, Brandon, MB, June 12 - 15, 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. *Uniform Mixing in Quantum Walks*. In: 22nd Ontario Combinatorics Workshop, York University, Toronto, ON, Canada, May 16 - 17, 2014.

RESEARCH EXPERIENCE	<b>University of Waterloo</b> <ul style="list-style-type: none"> <li>Graduate Research Assistant 2014 – 2016 Conducted mathematical experiments on continuous and discrete quantum walks, and maintained a website of useful data on average mixing, periodic vertices and strongly cospectral vertices</li> </ul>
TEACHING EXPERIENCE	<b>University of Waterloo</b> <ul style="list-style-type: none"> <li>Instructor Winter 2018 MATH 135: Algebra for Honors Mathematics</li> <li>Substitute Instructor Winter 2017 CO 444/644: Algebraic Graph Theory</li> <li>Teaching Assistant 2012 – 2017 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</li> </ul>
SERVICE	<b>Journal Reviewer</b> <ul style="list-style-type: none"> <li>Discrete Mathematics</li> <li>Linear Algebra and Its Applications</li> <li>Electronic Journal of Combinatorics</li> <li>ICALP</li> </ul>
AWARDS AND DISTICTIONS	<b>University of Waterloo</b> <ul style="list-style-type: none"> <li>Outstanding Achievement in Graduate Studies 2015</li> <li>Cotton Family Women in Mathematics Graduate Scholarship 2014, 2016, 2017</li> <li>Faculty of Arts Upper-Year Scholarship 2011-2012</li> <li>Robin K. Banks Scholarship 2011-2012</li> <li>Dean's Honours List 2011-2012</li> </ul>