

# Zhentao Li

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## Academic positions

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- **McGill University**, Visitor (on leave from ENS) 2017 – 2018  
Discrete Mathematics and Optimization group
- **École Normale Supérieure (Paris)**, Assistant professor 2013 – Present  
Algorithms group (TALGO), Computer Science Department (DI) *titularisé 09/2014*
- **École Normale Supérieure de Lyon**, Postdoc 2012 – 2013  
Laboratoire de l'Informatique du Parallélisme  
Supervisor: Prof. Stéphan Thomassé

## Education

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- **McGill University**, Ph.D. in Computer Science 2017 – 2011  
Thesis title: *Tree decompositions and linear time algorithms*  
Supervisor: Prof. Bruce Reed and Prof. Adrian Vetta
- **University of Waterloo**, M.Math in Combinatorics and Optimization 2006 – 2007  
Thesis title: *Algebraic methods for reducibility in nowhere zero flows*  
Supervisor: Prof. Bertrand Guenin
- **McGill University**, B.Sc. Honours Mathematics and Computer Science 2003 – 2006  
GPA: 3.9/4.0

## Research Interests

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My current focus is on **graph colouring** problems, especially of **planar graphs**. I use **computer-assisted** methods for **proof search** and would like to develop a **general framework** for doing so in mathematics, in particular discrete mathematics.

In general, I'm interested in **structural graph theory** and **graph algorithms**. Previously, I worked much on **graph minors** and **graphs excluding an induced subgraph** which are still of interest as potential applications. I am also interested in problems in the design and analysis of **algorithms**, **combinatorial optimization**, other branches of **combinatorics** and **theoretical computer science**.

## Refereed Publications

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- [1] **Z. Li** and B. Mohar. "Planar digraphs of digirth four are 2-colorable". In: *SIAM Journal on Discrete Mathematics* 31.3 (2017), pp. 2201–2205.
- [2] V. Cohen-Addad, M. Hebdige, **Z. Li**, E. Salgado. "Steinberg's Conjecture is false". In: *Journal of Combinatorial Theory, Series B* 122 (2017), pp. 452–456.
- [3] J. Chalopin, L. Esperet, **Z. Li**, P. O. Mendez. "Restricted frame graphs and a conjecture of Scott". In: *Electronic Journal of Combinatorics* 23.1 (2016), pp. 1–30.
- [4] N. Bousquet, A. Lagoutte, **Z. Li**, A. Parreau, S. Thomassé. "Identifying codes in hereditary classes of graphs and VC-dimension". In: *Siam Journal on Discrete Mathematics* 29.4 (2015), pp. 2047–2064.

- [5] N. Bousquet, **Z. Li**, A. Vetta. “Coalition games on interaction graphs: a horticultural perspective”. In: *Proceedings of EC 2015*. 2015, pp. 95–112.
- [6] P. Aboulker, **Z. Li**, S. Thomassé. “Excluding clocks”. In: *Proceedings of LAGOS’15*. 2015.
- [7] C. Figueiredo, **Z. Li**, H. M. Filho, R. Machado, N. Trotignon. “Using SPQR-trees to speed up algorithms based on 2-cutset decompositions”. In: *Proceedings of LAGOS’15*. 2015.
- [8] H. Hu, **Z. Li**, A. R. Vetta. “Randomized experimental design for causal graph discovery”. In: *Proceedings of NIPS 2014*. 2014, pp. 2339–2347.
- [9] V. Cohen-Addad, **Z. Li**, C. Mathieu, I. Milis. “Energy-efficient algorithms for non-preemptive speed-scaling”. In: *Proceedings of WAOA 2014*. Springer. 2014, pp. 107–118.
- [10] N. Delfosse, **Z. Li**, S. Thomassé. “A note on the minimum distance of quantum LDPC codes”. In: *Proceedings of MFCS 2014*. Springer. 2014, pp. 239–250.
- [11] **Z. Li**, M. Narayanan, A. Vetta. “The Complexity of the Simultaneous Cluster Problem.” In: *J. Graph Algorithms Appl.* 18.1 (2014), pp. 1–34.
- [12] M. Baïou, L. Beaudou, **Z. Li**, V. Limouzy. “Hardness and algorithms for variants of line graphs of directed graphs”. In: *Proceedings of ISAAC 2013*. Springer. 2013, pp. 196–206.
- [13] A. Gyárfás, **Z. Li**, R. Machado, A. Sebő, S. Thomassé, N. Trotignon. “Complements of nearly perfect graphs”. In: *Journal of Combinatorics* 4.3 (2013).
- [14] P. Keevash, **Z. Li**, B. Mohar, B. Reed. “Digraph girth via chromatic number”. In: *SIAM Journal on Discrete Mathematics* 27.2 (2013), pp. 693–696.
- [15] K.-i. Kawarabayashi, **Z. Li**, B. Reed. “Recognizing a totally odd  $K_4$ -subdivision, parity 2-disjoint rooted paths and a parity cycle through specified elements”. In: *Proceedings of SODA 2010*. Society for Industrial and Applied Mathematics. 2010, pp. 318–328.
- [16] **Z. Li** and A. Vetta. “Bounds on the cleaning times of robot vacuums”. In: *Operations Research Letters* 38.1 (2010), pp. 69–71.
- [17] X. Muñoz, **Z. Li**, I. Sau. “Edge-partitioning regular graphs for ring traffic grooming with a priori placement of the ADMs”. In: *SIAM Journal on Discrete Mathematics* 25.4 (2011), pp. 1490–1505.
- [18] **Z. Li** and I. Sau. “Graph partitioning and traffic grooming with bounded degree request graph”. In: *Proceedings of WG 2009*. Springer. 2009, pp. 250–261. **Best student paper award.**
- [19] B. Reed and **Z. Li**. “Optimization and recognition for  $K_5$ -minor free graphs in linear time”. In: *Proceedings of LATIN 2008*. Springer. 2008, pp. 206–215.
- [20] L. Addario-Berry, W. S. Kennedy, A. D. King, **Z. Li**, B. Reed. “Finding a maximum-weight induced  $k$ -partite subgraph of an  $i$ -triangulated graph”. In: *Discrete Applied Mathematics* 158.7 (2010), pp. 765–770.
- [21] L. Chindelevitch, **Z. Li**, E. Blais, M. Blanchette. “On the inference of parsimonious indel evolutionary scenarios”. In: *Journal of bioinformatics and computational biology* 4.03 (2006), pp. 721–744.
- [22] **Z. Li** and B. A. Reed. “Heap building bounds”. In: *Proceedings of WADS 2005*. Springer. 2005, pp. 14–23.

## Program committee

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- 10th International colloquium on graph theory and combinatorics

## Articles refereed

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- Journal of Combinatorial Theory, Series B
- Discrete Optimization
- Journal of Graph Theory
- SIAM Journal on Discrete Mathematics
- SIAM Journal on Computing
- Canadian Mathematical Bulletin
- Discrete Applied Mathematics
- Discrete Mathematics
- Integer Programming and Combinatorial Optimization (conference)
- ACM-SIAM Symposium on Discrete Algorithms (conference)

## Student supervision

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- Vincent Cohen-Addad, PhD student, co-advised with *Claire Mathieu*
- Esteban Salgado, year 1 masters student
- Enguerrand Prebet, year 3 undergraduate student
- Tutor of 9 undergraduate students at ENS

## Scholarships

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- FQRNT (Fonds de recherche du Québec - Nature et technologies) B3 (2012-2014)
- NSERC (Natural Science and Engineering Research Council of Canada) CGS D3 (2007-2010)
- FQRNT B2 (1st place out of 11) (2009) (Declined)
- Milton Leong Fellowship (2008)
- McGill Recruitment Excellence Fellowship (2007)
- NSERC CGS M (2006)

## Administrative positions

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- **Hiring committee** 2017  
Computer Science Department (DI), ENS
- **Organizer for the student selection contest** 2013 - 2017  
Computer Science Department (DI), ENS
- **Assisting undergraduate, masters and maths-CS internships** 2015 - 2017  
Computer Science Department (DI), ENS
- **International students selection committee** 2013 - 2015  
Computer Science Department (DI), ENS

- **Organizer for the student meeting and problem session** 2010 - 2011  
McGill Discrete Mathematics and Optimization Group
- **Coach for McGill's ACM ICPC team** 2009 - 2010  
McGill School of Computer Science
- **Co-founder and organizer for the open problem session** 2007  
Univ. of Waterloo Dept. of Combinatorics & Optimization

## Teaching experience

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- **Combinatorial and convex optimization**, Course Lecture Fall 2015 - 2016  
*Département d'informatique, École Normale Supérieure*
- **Algorithms and programming**, Chargé de TDs Fall 2013 - 2016  
*Département d'informatique, École Normale Supérieure*
- **Intro. to programming for non-CS students**, Course Lecturer Winter 2014, 2016, 2017  
*Département d'informatique, École Normale Supérieure*
- **Algorithms for embedded graphs**, Guest lecturer Fall 2013  
*Département d'informatique, École Normale Supérieure*
- **Graph Theory and Combinatorics**, Teaching Assistant Winter 2011  
*Department of Mathematics and Statistics, McGill University*
- **Discrete Math for Engineers**, Course Lecturer Winter 2010  
*Department of Mathematics and Statistics, McGill University*
- **Data Structures and Algorithms**, Teaching Assistant Fall 2009  
*School of Computer Science, McGill University*
- **Linear Optimization**, Teaching Assistant Fall 2006  
*Dept. of Combinatorics & Optimization, University of Waterloo*
- **Math Helpdesk**, Tutor Fall 2004 - Winter 2006  
*Department of Mathematics and Statistics, McGill University*