# Calum MacRury


**Contact Information**

University of Toronto
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**Education**

**University of Toronto**

Toronto, Ontario
Ph.D. in Computer Science, 2018-2022 (Expected)

- Supervisor: Dr. Allan Borodin

**McGill University**

Montreal, Quebec
Master's of Science, Mathematics, 2016-2018

- Dissertation Title: Approximation Algorithms for Network Flow and Minimum Cut Problems
- Supervisor: Dr. Dmitry Jakobson

**Dalhousie University**

Halifax, Nova Scotia
Bachelor of Science, Honours in Mathematics with a Minor in Computer Science, 2012-2016

- Honour's Thesis: The Spectral Theorem
- Supervisor: Dr. Keith Taylor

**Employment History**

**Ryerson University, Department of Mathematics**

Toronto, Ontario
Summer 2014, 2015 and 2016

- Research Assistant, supervised by Dr. Paweł Prałat
- Supported by NSERC undergraduate research grants in 2014 and 2015

**Preprints**

*The Phase Transition of Discrepancy in Random Hypergraphs*, C. MacRury, T. Masařík, L. Pei, and X. Pérez-Giménez, Submitted 2020.

*Greedy Approaches to Online Stochastic Matching*, A. Borodin, C. MacRury, and A. Rakheja, arXiv preprint arXiv:2008.09260, 2020.

*Hamilton Cycles in the Semi-random Graph Process*, P. Gao, B. Kaminski, C. MacRury, and P. Pralat, arXiv preprint arXiv:2006.02599, 2020.

*Bipartite Stochastic Matching: Online, Random Order, and I.I.D. Models*, A. Borodin, C. MacRury, and A. Rakheja, arXiv preprint arXiv:2004.14304, 2020.

*Localization Game for Random Graphs*, A. Dudek, S. English, A. Frieze, C. MacRury, and P. Pralat, arXiv preprint arXiv:1910.11225, 2019.

**Accepted Papers**

*Zero Forcing Number of Random Regular Graphs*, D. Bal, P. Bennett, S. English, C.

MacRury, and P. Pralat, Accepted to Journal of Combinatorics (2020), 21pp.

*Searching the Half-line with a Probabilistically Faulty Robot*, A. Bonato, K. Georgiou, C. MacRury, P. Pralat, Proceedings of LATIN'20.

## Refereed Publications

*Probabilistic Zero Forcing on Random Graphs*, S. English, C. MacRury, and P. Pralat, European Journal of Combinatorics 91 (2021), 103207.

*The Robot Crawler Graph Process*, A. Bonato, R.M. del Rio-Chanona, C. MacRury, J. Nicolaidis, X. Perez-Gimenez, P. Prałat, K. Ternovsky, Discrete Applied Mathematics 247 (2018) 23–36.

*Distribution of Coefficients of Rank Polynomials for Random Sparse Graphs*, D. Jakobson, C. MacRury, S. Norin, L. Turner, Electronic Journal of Combinatorics, 25(4) (2018) P4.50.

*The Robot Crawler Number of a Graph*, A. Bonato, R.M. del Rio-Chanona, C. MacRury, J. Nicolaidis, X. Perez-Gimenez, P. Prałat, K. Ternovsky, Proceedings of the 12th Workshop on Algorithms and Models for the Web-Graph (WAW2015), Lecture Notes in Computer Science 9479, Springer, (2015) 132-147.

## Technical Notes

*Injective Colouring of Binomial Random Graphs*, R.M. del Rio-Chanona, C. MacRury, J. Nicolaidis, X. Perez-Gimenez, P. Prałat, K. Ternovsky, (2016) 11pp.

## Theses

*Approximation Algorithms for Network Flow and Minimum Cut Problems*, Master's Thesis at McGill University.

## Selected Workshops Attended

*Mathematics of Online Decision Making*, virtual (formerly at Simon's Institute, Berkeley, California), October 2020.

*17th Workshop on Algorithms and Models for the Web Graph (WAW)*, virtual (formerly at SGH Warsaw School of Economics, Warsaw, Poland), September 2020.

*Graduate Research Workshop in Combinatorics*, University of Kansas, Lawrence, Kansas, June 2019.

*American Mathematical Society Sectional Meeting*, University of Michigan, Ann Arbor, Michigan October 2018.

*Summer School on Random Graphs and Probabilistic Methods*, Field's Institute, Toronto, Ontario, June 2017.

*13th Workshop on Algorithms and Models for the Web Graph (WAW)*, Universite de Montreal, Montreal, Quebec, December 2016.

*CRM Summer School on Spectral Theory and Applications*, Universite Laval, Quebec City, Quebec, July 2016.

## Scholarships and Awards

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| 2018-2021 | NSERC CGS Doctoral Award. |
| 2017-2018 | NSERC CGS Master's Award. |
| 2016 | NSERC Undergraduate Student Research Award. |
| 2015 | NSERC Undergraduate Student Research Award. |
| 2012-2016 | Seymour Schulich Scholarship Renewable. |
| | Sexton Scholar Award. |

## Teaching Experience

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| Fall | 2020 | Teaching Assistant, Advanced Algorithms, CSC473, University of Toronto. |
| Winter | 2020 | Teaching Assistant, Advanced Algorithms, CSC473, University of Toronto. |
| Winter | 2020 | Teaching Assistant, Statistical Learning Theory, CSC 2532, University of Toronto. |
| Fall | 2019 | Teaching Assistant, Game Theory, CSC304H1, University of Toronto. |
| Winter | 2019 | Teaching Assistant, Advanced Algorithms, CSC473, University of Toronto. |
| Fall | 2018 | Teaching Assistant, Design and Analysis of Algorithms, CSC373, University of Toronto. |
| Winter | 2018 | Teaching Assistant, Linear Algebra for Engineers, MAT188, University of Toronto. |
| Fall | 2017 | Teaching Assistant, Calculus I, MAT137, University of Toronto. |

## References

**Dr. Allan Borodin**, Professor, University of Toronto,
Department of Computer Science (Toronto, ON), aborodin@cs.toronto.edu

**Dr. Dmitry Jakobson**, Professor, McGill University,
Department of Mathematics (Montreal, QC), dmitry.jakobson@mcgill.ca

**Dr. Paweł Prałat**, Associate Professor, Ryerson University,
Department of Mathematics (Toronto, ON), pralat@ryerson.ca