
Samuel Johnson

Department of Mathematics, Simon Fraser University
8888 University Drive, Burnaby BC, Canada V5A 1S6
tel. +1 778 782 5754 *fax* +1 778 782 4947

Education

2012 - Present PhD candidate, Pure Mathematics, Simon Fraser University
(*supervisor: Marni Mishna*)

2010 - 2012 Master of Science, Pure Mathematics, Simon Fraser University
Thesis topic: Asymptotic analysis of walks with small steps in the quarter plane (*supervisor: Marni Mishna*)

2009 Bachelor of Mathematics (Honours), University of Newcastle, Australia
Honours thesis title: Simple groups of automorphisms of locally finite trees. (*honours supervisor: George Willis*)

Awards, Honors and Scholarships

2012 Graduate fellowship, Simon Fraser University

2009 Honours scholarship, University of Newcastle

2008 Ivan Lincoln Rose Prize in Applied Mathematics, University of Newcastle

2008 Undergraduate summer research scholarship, AMSI

2005 - 2009 ESSUN Commonwealth scholarship, administered by the University of Newcastle

Research

Research Interests

For my Masters thesis, I developed combinatorial techniques to bound and prove the exponential growth of counting sequences associated with walks with small steps in the quarter plane. Using these techniques we proved the exponential growth factors for all D-finite models of such walks. Recently the focus has shifted to a more general view of lattice path models. We are applying the above techniques to the larger family of D-finite models, and making predictions of the subexponential factors for models satisfying certain growth properties. We are also learning how to view this problem from a multivariate generating function perspective, specifically viewing these functions as analytic objects of several complex variables and understanding how to apply generalised results of analytic combinatorics to these cases.

Publications

Theses

1. Johnson S. Analytic combinatorics of planar lattice paths. Simon Fraser University, 2012, 97 pages.

Manuscripts in Progress

2. Johnson S., Mishna M. and Yeats K. Towards a combinatorial understanding of lattice path asymptotics. 2012, 12 pages.

Presentations

Conference Presentations

- June 2012** CMS Summer Meeting, University of Regina. Talk entitled ‘The exponential growth of restricted lattice paths.’
- June 2012** CMS Summer Meeting, University of Regina. Poster presentation entitled ‘The exponential growth of lattice paths.’
- August 2011** Computational Math Day, Simon Fraser University. Poster presentation entitled ‘Asymptotic analysis of walks with small steps in the quarter plane.’
- May 2011** CanaDAM, University of Victoria. Talk entitled ‘Asymptotic analysis of walks with small steps in the quarter plane.’ Joint presentation with Steve Melczer.
- April 2011** PIMS Young Researcher Conference, University of British Columbia. Talk entitled ‘Asymptotic analysis of walks with small steps in the quarter plane.’ Joint presentation with Steve Melczer.

Instructional Talks

- October 2011** Simon Fraser University. Instructional talk on Multiple Zeta Values, focusing on the algebra of Lyndon words.
- May 2011** Simon Fraser University. Series of four one hour long instructional talks on the paper ‘Basic analytic combinatorics of directed lattice paths’ by Cyril Banderier and Phillipe Faljolet.

Research Seminar Presentations

- October 2012** Simon Fraser Learning Seminar on Several Complex Variables. The Riemann Mapping Theorem in several complex variables: a counter example.
- December 2011** University of Newcastle weekly maths seminar. Analytic combinatorics of walks with small steps in the quarter plane.
- November 2011** Simon Fraser Discrete Mathematics Seminar. Analytic combinatorics of walks with small steps in the quarter plane.

Coursework

Fall 2012 Topological Graph Theory, Prof. Bojan Mohar.

Fall 2012 Reading Course on several complex variables, with applications to examples in combinatorics, Asst. Prof. Karen Yeats.

TA Duties

Semester	Assignment	Hours/week	Duties
2012-3	Calculus Support	9	Preparing and presenting a weekly one hour tutorial for at risk calculus students.
2012-3	Applied Calculus Workshop	9	Workshop hours, marking, moderation of online discussion boards.
2012-1	Applied Calculus Workshop	9	Workshop hours, marking, moderation of online discussion boards.
2012-1	Calculus Support	6	Preparing and presenting a weekly one hour tutorial for at risk calculus students.
2011-3	MACM316 - Numerical Analysis	9	Tutorials, marking.
2011-1	Algebra Workshop	6	Marking.
2011-1	Math150 - Centre for Online and Distance Education	9	Marking, moderation of online discussion boards.
2010-3	Applied Calculus Workshop	15	Workshop hours, marking, moderation of online discussion boards.

Service to the Academic Community

- **Conference organizing committee**

- 2011 Volunteer, ThinkAgain! cross discipline graduate student conference, Simon Fraser University

- **Student life**

- 2011-2013 Mathematics Graduate Student Caucus President, Simon Fraser University (SFU)
- 2011-2012 Member of the Collective Advocacy and Campaigns Committee of the SFU Graduate Student Society (GSS)
- 2010-2012 Member of the Graduate Student Society Benefit Plan Committee of the SFU GSS
- 2010-2011 GSS council representative for the SFU Department of Mathematics Graduate Student Caucus
- 2005 University of Newcastle Union (UNU) Limited director, Faculty of Engineering, University of Newcastle