

RICHARD HOSHINO

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1. Education

Ph.D.	Dalhousie University (Mathematics) <i>Thesis Title: Independence Polynomials of Circulant Graphs</i>	2008
M.Sc.	Dalhousie University (Mathematics) <i>Thesis Title: An Analysis of the Ehrenfeucht Game on Graphs</i>	2002
B.Math	University of Waterloo (Mathematics)	2001
B.Ed.	Queen's University (Education)	2001
Research Interests	<i>Discrete Mathematics</i> (e.g. graph theory, combinatorics) <i>Informatics</i> (e.g. data mining, graph mining) <i>Operations Research</i> (e.g. scheduling, algorithm evaluation)	

2. Employment History

Government of Canada January 2006 to January 2010
Canada Border Services Agency (CBSA)
Manager, Mathematics and Data Exploration section

- Established and managed a centralized Math Group to provide analytical services to the entire Agency, collaborating with senior executives to identify projects where mathematics and statistics could be applied to improve border management.
- Developed a new methodology to improve the efficiency of container inspection at CBSA marine ports, leading to the publication of a paper in the *Annals of Operations Research*.
- Produced an optimal scoring algorithm for biometric identification, leading to the presentation of a paper at an international conference on biometric performance.
- Created a new risk-scoring algorithm for high-risk marine containers, based on a statistical analysis of two years of historical data (3.8 million containers).
- Designed an optimized schedule for customs officers at an international airport, as well as a fully-customizable staff allocation model for land ports-of-entry that minimizes overall cost.
- Invited speaker at two U.S. conferences on counterterrorism and national security.
- Supervised and mentored 15 full-time and part-time employees since 2006.

3. Teaching Experience

- Math 1010 at Dalhousie University, a first-year calculus course
(*recipient of the university's award for Teaching Excellence in 2002*)
- Math 2790 at Dalhousie University, a second-year course on Mathematical Problem-Solving
- C&O 380 at the University of Waterloo, a third-year course on Mathematical Problem-Solving
(*recipient of the university's award for Distinguished Teaching in 2001*)

4. Selected Awards and Scholarships

- One of 150 public servants chosen for *canada@150*, a national initiative for future leaders to identify and develop solutions to key policy challenges facing Canada (2008-09).
- Entered the Government of Canada through the Recruitment of Policy Leaders Program, as one of thirty recruits chosen from over a thousand applicants (2006).
- NSERC Canada Graduate Scholarship, the top federal scholarship given to graduate students in Canada (2003-05).
- Izzak Walton Killam Scholarship, the top graduate scholarship at Dalhousie (2003-05).
- Action Canada Fellowship, a national program that identifies and develops the country's twenty "best and brightest" emerging leaders (2003).
- NSERC Post-Graduate Scholarship (2001-03).
- Honorable Mention, Putnam Mathematics Competition (1999, 2000).
- K.D. Fryer Scholarship, the top undergraduate scholarship at Waterloo (1996-2000).
- Silver Medalist at the 37th International Mathematical Olympiad (*IMO*) in India (1996).
- Second place in Canada, Canadian Mathematical Olympiad (1996).

5. Publications

Academic Publications

- D. Gorodnichy and R. Hoshino, A Post-Processing Algorithm for Optimal Biometrics-Based Access Control, submitted.
- D. Gorodnichy and R. Hoshino, Calibrated Confidence Scoring for Biometric Identification, to appear in the proceedings of the *2010 NIST International Conference on Biometric Performance*.
- R. Hoshino, R. W. Oldford, M. Zhu, Two-stage Approach for Unbalanced Classification with Time-varying Decision Boundary: Application to Marine Container Inspection, submitted.
- J. I. Brown and R. Hoshino, Proof of a Conjecture on Fractional Ramsey Numbers, *Journal of Graph Theory* **63** (2010) 164-178.
- R. Hoshino et. al., Applications and Extensions of Cost Curves to Marine Container Inspection, *Annals of Operations Research* (2009) DOI 10.1007/s10479-009-0669-2.
- J. I. Brown and R. Hoshino, Independence Polynomials of Circulants with an Application to Music, *Discrete Mathematics* **309** (2009) 2292-2304.
- J. I. Brown and R. Hoshino, Nordhaus-Gaddum Inequalities for the Fractional and Circular Chromatic Numbers, *Discrete Mathematics* **309** (2009) 2223-2232.
- J. I. Brown and R. Hoshino, Line Graphs and Circulants, to appear in *Ars Combinatoria*.
- J. I. Brown and R. Hoshino, Circulant Graphs Uniquely Characterized by their Independence Polynomials, to appear in *Ars Combinatoria*.
- J. I. Brown and R. Hoshino, The Ehrenfeucht-Fraïssé Game for Paths and Cycles, *Ars Combinatoria* **83** (2007) 192-212.

Non-Academic Publications

- Contributing Author in Notes from Canada's Young Activists: A Generation Stands Up For Change, Douglas & McIntyre, 2007.
- R. Hoshino and J. Grant McLoughlin, Combinatorial Explorations, *Canadian Mathematical Society ATOM Series*, 2005.

6. Service

- Active member and volunteer for the Canadian Mathematical Society (1997-present).
- Referee for the Annals of Operations Research and Discrete Applied Mathematics (2008-present).
- Tutor for Discovery University, a program for citizens living below the poverty line (2008-09).
- Member of Problems Committee for the Grade 12 Euclid Math Contest (1998-2008).
- Member of Problems Committee for the Canadian Math Olympiad (2001-02, 2004-06).
- Member of Problems Committee for the Asian-Pacific Mathematical Olympiad (2002-04).
- Founder and Director of the Nova Scotia High School Math League (2002-2004), a Saturday morning mathematics program with over 400 participants across Nova Scotia.
- Founder and Director of the Dalhousie Math Circles Outreach Program (2002-2004), an evening outreach program for local high school students which recently received a \$400,000 grant to expand the program to the entire province.
- Director of the Canadian Mathematical Society National Camp for the top Grade 9 and 10 high school students in Canada (1999-2004).
- Member of Search Committee for the Director of the Centre for Learning and Teaching at Dalhousie University (2004).
- Co-organizer of the Education Session at the Summer Meeting of the Canadian Mathematical Society (2004).
- Deputy Leader of Canada's team to the 44th IMO in Tokyo, Japan (2003).
- Coach of the Dalhousie University Putnam team (2001-03).
- Deputy Leader Observer of Canada's team to the 42nd IMO in Washington D.C. (2001).

7. Invited Presentations

Informatics and Operations Research

- *Text Analysis and Machine Learning*, seminar at the University of Ottawa, February 2009.
- *Artificial Intelligence Group*, seminar at the University of Alberta, December 2008.
- *Port Security, Inspection, Risk Analysis and Modeling*, conference at Rutgers University, November 2008.
- *Information Technology Group*, seminar at the National Research Council, November 2008.
- *Computational Mathematics Colloquium*, seminar at the University of Waterloo, April 2008.
- *Canadian Mathematical Society*, conference at York University, December 2006.
- *Laboratory for Port Security*, seminar at Rutgers University, November 2006.
- *Mathematical Methods in Counterterrorism Conference*, Washington D.C., September 2006.

Discrete Mathematics

- *Discrete Mathematics Group*, seminar at the University of Ottawa, November 2009.
- *Graduate Student Colloquium*, seminar at Dalhousie University, March 2005.
- *East Coast Combinatorics Group*, seminar at Dalhousie University, November 2004.
- *Undergraduate Colloquium*, seminar at the University of New Brunswick, March 2004.
- *Pure Math Colloquium*, seminar at the University of Waterloo, November 2003.
- *Honors Colloquium*, seminar at Acadia University, September 2003.
- *East Coast Combinatorics Group*, conference at the University of P.E.I., October 2002.
- *Graphlets and Graph Evolution Group*, seminar at Dalhousie University, February 2002.

Mathematics Education

^{KS} denotes “keynote speaker”

- *Mathematics Education Research Unit*, University of Ottawa, September 2009.
- *Mathematics Education Research Unit*, University of Ottawa, January 2009.
- *Summer Institute for Teachers of Mathematics*, University of Waterloo, August 2006.
- *Canadian Undergraduate Math Conference*^{KS}, McGill University, July 2006.
- *Summer Institute for Teachers of Mathematics*, University of Waterloo, August 2005.
- *Canadian Undergraduate Math Conference*^{KS}, Queen’s University, July 2005.
- *Ontario Association of Mathematics Educators*^{KS}, conference in Toronto, February 2005.
- *Canadian Mathematical Society*, summer meeting at Dalhousie University, June 2004.
- *Nova Scotia Math Teachers Association*, conference in Truro, October 2003.
- *Canadian Math Education Study Group*, conference at Acadia University, June 2003.
- *University Teaching and Learning*, conference at Dalhousie University, May 2003.
- *Nova Scotia Math Teachers Day*^{KS}, workshop at St. FX University, March 2003.
- *New Experiences in Teaching Math*, conference at Mount Allison University, October 2002.
- *Society for Teaching and Learning in Higher Education*, conference at McMaster University, June 2003.
- *University Teaching and Learning*, conference at Dalhousie University, May 2002.
- *Ontario Association of Mathematics Educators*, conference in Toronto, May 2001.
- *Ontario Association of Mathematics Educators*, conference in Ottawa, May 2000.
- *Ontario Association of Mathematics Educators*, conference in Toronto, May 1999.
- Invited speaker at 17 high schools in Ottawa and Nova Scotia (2003-09).
- Conducted 10 workshops for high school teachers in Atlantic Canada (2003-04).

8. Personal Information

Date of Birth	June 15 th , 1978
Citizenship	Canadian
Languages	Fluent English, fluent French, and conversational Japanese

9. References

- Jason I. Brown, Ph.D.,
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