C U R R I C U L U M V I T A E

CHRISTOPHER GEORGE SMALL

EDUCATION

1982 Ph.D. Statistics, University of Cambridge. Dissertation title: Distributions of shape and maximal invariant statistics. Supervisor: David G. Kendall.

1978 M.Sc. Mathematics, University of Alberta. Thesis title: Classification of monotone analytic functions on surfaces. Supervisor: James G. Timourian.

1976 B.Sc. (High Honours) Mathematics, University of Regina.

RESEARCH INTERESTS

- The statistical analysis of shape
- Estimating functions, foundations of inference
- Multivariate nonparametric techniques, multivariate medians
- Geometric probability.

ACADEMIC APPOINTMENTS

1993– Professor, Statistics & Actuarial Science, Univ. Waterloo.

1987–1993 Assoc. Professor, Statistics & Actuarial Science, Univ. Waterloo.

Fall 1985 Lektorvikar, Matematisk Insitute, Odense Universitat.

1982–1987 Assist. Professor, Statistics & Actuarial Science, Univ. Waterloo.

1981–1982 Assist. Professor, Mathematics & Statistics, Simon Fraser Univ.

ADMINISTRATIVE APPOINTMENTS

1996–1998 Associate Chair for Graduate Affairs, Statistics & Actuarial Science, Univ. Waterloo.

1991–1992 Associate Chair for Graduate Affairs, Statistics & Actuarial Science, Univ. Waterloo.

RESEARCH GRANTS

2008–2012 NSERC Discovery Grant, $12,000/yr.

2003–2008 NSERC Discovery Grant, $23,000/yr.

1999–2003 NSERC Operating Grant, $20,000/yr.

1995–1999 NSERC Operating Grant, $14,000/yr.

1992–1995 NSERC Operating Grant, $14,000/yr.

1989–1992 NSERC Operating Grant, $12,500/yr.

1986–1989 NSERC Operating Grant, $7,000/yr.

1983–1986 NSERC Operating Grant, $4,500/yr.

PROFESSIONAL ACTIVITIES

2008–2011 Chair, CMS International Math Olympiad Committee.

2004 Systematic Program Review, Math & Stats, Univ. Saskatchewan.

2004 Canadian Leader, International Math Olympiad, Athens, Greece.

2001–2004 Member, CMS Asia-Pacific Math Olympiad Committee.

2001 Canadian Leader, International Math Olympiad, Washington DC.

2000 Canadian Deputy Leader, International Math Olympiad, S. Korea.

1999–2000 Member, International Advisory Board for Chiba University, Japan.

1999–2002 Member, CMS Math Olympiad Committee.

1998–2008 Member, CMS International Math Olympiad Committee.

1998 Canadian Leader, International Math Olympiad, Taiwan.

1997 Leader Observer, International Math Olympiad, Argentina.

1995 Coordinator, International Math Olympiad, York University.

1993–1995 Member, CMS Canadian Mathematical Olympiad Committee.

1991–1994 Member, Board of Directors, International Math Olympiad 1995.

PROFESSIONAL AFFILIATIONS

- Member of the Statistical Society of Canada
- Member of the Canadian Mathematical Society
- Member of the Institute of Mathematical Statistics

BOOKS

1. Small, C. G. (2010). *Expansions and Asymptotics for Statistics.* Chapman and Hall/CRC Monographs on Statistics and Applied Probability, 343+xiv pages.

2. Small, C. G. (2006). *Functional Equations and How to Solve Them.* Springer Problem Books in Mathematics, Springer, New York, 141 pages.

3. Small, C.G. and Wang, J. (2003). *Numerical Methods for Nonlinear Estimating Equations.* Oxford University Press, 310 pages.

4. Small, C.G. (1996). *The Statistical Theory of Shape.* Springer, New York, 227 pages. Reviewed in: *Zentralblatt für Mathematik und ihre Grenzgebiete* 859.1997, S. 395. Also reviewed in *Short Book Reviews* Vol. 17, p. 4.

5. Small, C.G. and McLeish, D.L. (1994). *Hilbert Space Methods in Probability and Statistical Inference.* Wiley, New York, 252 pages. Reviewed in: *J. Amer. Statist. Assoc.* 1995, pp. 1491-1492. Also reviewed in *Short Book Reviews* Vol 14, p. 47.

6. McLeish, D.L. and Small, C.G. (1988). *The Theory and Applications of Statistical Inference Functions.* Springer Lecture Notes in Statistics #44, Springer, 120 pages. Reviewed in: *Math. Reviews* 89h:62004; *Zentralblatt für Mathematik und ihre Grenzgebiete* 654.1989; *Short Book Reviews*, Vol 9.1981.1; *Cashiers du Centre d'Etudes de Recherche Operationelle* 2-3. 1988.

REFEREED PAPERS

1. Chenouri, S. and Small, C. G. (2011). A nonparametric multivariate multisample test based on data depth. Conditionally accepted for *Electronic J. Statist.*

2. Small, C. G. (2011). Statistics of shape. *Wiley Interdisc. Rev.: Comp. Statist.* 3. doi: 10.1002/wics.173.

3. Hosseinkashi, Y., Chenouri, S., Small, C. G. and Deardon, R. (2011). Stochastic graph models and their application in the UK 2001 foot-and-mouth epidemic. Accepted for *Can. J. Statist.*

4. Chenouri, S., Small, C. G. and Farrar, T. J. (2011). Data depth-based nonparametric scale tests. *Can. J. Statist.* 39, 356–369.

5. Luna Cabañero, L. and Small, C. G. (2009). Intentionality and computationalism: a diagonal argument. *Mind and Matter* 7, 81–90.

6. Heo, G. and Small, C. G. (2006). Form representations and form averages: a survey and comparative study. *Computer Vision and Image Understanding* 102, 188-203.

7. Huang, X. and Small, C. G. (2003). Calculating the simplex median. *Statistics and Computing* 14, 91-98.

8. Albert, M., Le, H. and Small, C. G. (2003). Assessing landmark influence on shape variation. *Biometrika* 90, 669-678.

9. Small, C. G. and Le, H. (2002). The statistical analysis of dynamic curves and sections. *Pattern Recognition* 35, 1597-1609.

10. Small, C.G., Wang, J. and Yang, Z. (2000). Eliminating multiple root problems in estimation. *Statistical Science* 15, 313-341.

11. Small, C.G. and Yang, Z. (1999). Multiple roots of estimating functions. *Can. J. Statist.* 27, 585-598.

12. Le, H. and Small, C.G. (1999). Multidimensional scaling of simplex shapes. *Pattern Recognition* 32, 1601-1613.

13. Small, C.G. and Le, H. (1997). Q-mode analysis using simplex shapes. *Bull. Int. Statist. Inst. 51*$^{\text{st}}$ *Session*, Vol. 2, Istanbul, 123-125.

14. Small, C.G. (1996). Multidimensional medians arising from geodesics on graphs, *Ann. Statist. 25*, 478-494.

15. Small, C.G. and Lewis, M.E. (1995). Shape metrics and Frobenius norms, in *Current Issues in Statistical Shape Analysis*, Leeds University Press, Leeds.

16. Small, C.G. and Murdoch, D.J. (1993). Nonparametric Neyman-Scott problems: telescoping product methods. *Biometrika 80*, 763-779.

17. Small, C.G. (1992). A counterexample to a conjecture on random shadows. *Can. J. Statist. 20*, 463-468.

18. McLeish, D.L. and Small, C.G. (1991). A projected likelihood function for semi-parametric models. *Biometrika 78*, 93-102.

19. Small, C.G. (1991). Reconstructing convex bodies from random projected images. *Can. J. Statist. 19*, 341-348.

20. Small, C.G. and McLeish, D.L. (1991). Geometrical aspects of efficiency criteria for spaces of estimating functions. In *Estimating Functions*, V.P. Godambe ed., Statistical Science Series, Oxford University, 267-276.

21. Small, C.G. (1990). A survey of multidimensional medians. *Int. Statist. Rev. 58*, 263-277.

22. Small, C.G. and McLeish, D.L. (1989). Projection as a method for increasing sensitivity and eliminating nuisance parameters, *Biometrika 76*, 693-703.

23. Small, C.G. (1989). On functionals of random convex hulls, *Can. J. Statist. 17*, 41-43.

24. Small, C.G. (1988). Techniques of shape analysis on sets of points, *Int. Statist. Rev. 56*, 243-257.

25. Small, C.G. and McLeish, D.L. (1988). Generalizations of ancillarity, completeness and sufficiency in an inference function space, *Ann. Statist. 16*, 534-551.

26. Small, C.G. (1987). Measures of centrality for multivariate and directional distributions, *Can. J. Statist. 15*, 31-39.

27. Small, C.G. (1987). A survey of shape statistics, *ASA 1987 Proc. Section on Statist. Graphics*, 1-9.

28. McLeish, D.L. and Small, C.G. (1987). Likelihood asymptotics for the discrimination problem, in *Applied Probability, Stochastic Processes and Sampling Theory*, I.B. MacNeill and G.J. Umphrey, eds., 167-177.

29. McLeish, D.L. and Small, C.G. (1986). Likelihood methods for the discrimination problem, *Biometrika 73*, 397-403.

30. Bradley, R. and Small, C. (1986). Statistical analysis of structures at two settlements from bronze age England. Invited paper in *MASCA J. 4*, Museum Applied Science Center for Archaeology (MASCA), University Museum, University of Pennsylvania, 86-95.

31. Small, C.G. (1985). Decomposition of models whose marginal distributions are mixtures, *Can. J. Statist. 13*, 131-136.

32. Bradley, R. and Small, C. (1985). Looking for circular structures in post hold distributions: quantitative analysis of two settlement plans from bronze age England, *J. Archaeological Science 12*, 285-297.

33. Small, C.G. (1984). A classification theorem for planar distributions based upon the shape statistics of independent tetrads, *Math. Proc. Camb. Philos. Soc. 96*, 543-547.

34. Small, C.G. (1983). Characterization of type from maximal invariant spectra, *Ann. Statist. 11*, 979-983.

35. Small, C.G. (1983). Characterization results for maximal invariant statistics, *Z. Wahrscheinlichkeits. verw. Gebiete 63*, 517-527.

36. Small, C.G. (1982). Random uniform triangles and the alignment problem, *Math. Proc. Camb. Philos. Soc. 91*, 315-322.

BOOK REVIEWS, DISCUSSION OF PAPERS, UNREFEREED ARTICLES, & MANUSCRIPTS

1. Small, C. G. and Heo, G. (2007). Estimating parameters in clinical form analysis. Manuscript.

2. VanderBurgh, I. and Small, C. G. (2006). The Bernoulli Trials 2004. *Mathematics Magazine* 79, 199—205.

3. Small, C. G. (2005). Mathematical realism and the limits of reason. In *Gibt Es Sicheres Wissen?*, Grundlagenprobleme unserer Zeit, Band V, edited by Michael Rahnfeld. Leipziger Universitätsverlag, 284—313.

4. Short Book Reviews, April 2005. Review of *Skew-Elliptical Distributions and Their Applications*, by M. G. Genton, ed., Chapman and Hall/CRC 2004.

5. Small, C. (2004). Report of the 45th International Mathematical Olympiad. *CMS Notes* 36, no. 6, pp. 19-21.

6. Small, C. G. (2003). Reflections on Gödel's ontological argument. In *Klarheit in Religionsdingen: Aktuelle Beiträge zur Religionsphilosophie*, Grundlagenprobleme unserer Zeit, Band III, edited by W. Deppert and M. Rahnfeld. Leipziger Universitätsverlag, Leipzig, 109-144.

7. Short Book Reviews 21, 2001. Review of *An Invariant Approach to Statistical Analysis of Shapes*, by S. Lele and J. Richtsmeier, Chapman and Hall, New York 2001.

8. *Crux with Mayhem* 27, No. 4, 2001. Review of *Mathematical Olympiads 1998-1999* by T. Andreescu and Zuming Feng, MAA, Washington, D.C., 2000.

9. VanderBurgh, I. and Small, C. G. (2001). The Bernoulli Trials 2001. *Crux Math. with Math. Mayhem* 27, 353-356. Hints and answers. *Crux Math. with math. Mayhem* 27, 481-483.

10. Small, C. G. and Chun, B. K. (2000). The Bernoulli Trials 2000. *Crux Math. with Math. Mayhem* 26, 258-260.

11. Small, C.G. (1999). Discussion of "Multivariate L-estimation" by R. Fraiman and J. Meloche. *Test* 8, 255-317.

12. Small, C. G. and Maharaj, R. (1999). The Bernoulli Trials 1999. *Crux Math. with Math. Mayhem* 25, 321-324. Hints and answers: *Crux Math. with Math. Mayhem* 25, 449-451.

13. Short Book Reviews 19, 1999. Review of *Active Contours*, by A. Blake and M. Isard, Springer London, 1998.

14. Goulden, I. and Small, C. G. (1998). The Bernoulli Trials 1998. *Crux Math. with Math. Mayhem* 24, 257-260. Hints and answers: *Crux Math. with Math. Mayhem* 24, 449-451.

15. Small, C.G. (1997). The Bernoulli Trials 1997, *Crux Math. with Math. Mayhem* 23, 193-195. Hints and answers: *Crux Math. with Math. Mayhem* 23, 257-259.

16. Short Book Reviews 17, 1997. Review of *Statistical Methods, a Geometric Primer*, by D.J. Saville and G.R. Wood, Springer New York, 1996.

17. Short Book Reviews 11, No. 1, 1991. Review of *A Functional Analytic Approach to Statistical Experiments*, by I.M. Bomze, Longman/Wiley, New York 1990.

18. Small, C.G. (1991). Discussion of "Procrustes methods in the statistical analysis of shape" by C. Goodall, *J. Roy. Statist. Soc. Series A* 53, 285-340.

19. Short Book Reviews 10, No. 2, 1990. Review of *Decomposition and invariance of measures, and statistical transformation models*, by O.E. Barndorff-Nielsen, P. Blaesild, and P.S. Eriksen, Springer, new York.

20. Small, C.G. (1989). Discussion of "A survey of the statistical theory of shape" by D.G. Kendall, *Statist. Science 4*, 87-120.

21. Small, C.G. and McLeish, D.L. (1989). Discussion of "An extension of quasi-likelihood estimation" by V.P. Godambe and M.E. Thompson, *J. Statist. Plann. Inf.,* 137-172.

22. Small, C.G. (1987). Discussion of "Exponential dispersion models" by B. Jorgensen, *J. Roy. Statist. Soc. Series B* 49.

23. Small, C.G. (1980). Discussion of "Simulating the ley hunter" by S. Broadbent, *J. Roy. Statist. Soc. Series A 143*, 109-140.

CONFERENCE SESSIONS ORGANISED

1. Vancouver, May 31–June 3, 2009. Invited paper session on "Multivariate nonparametrics." Statistical Society of Canada Annual Meeting: Session speakers: Hannu OJA, University of Tampere, Ivan MIZERA, University of Alberta, Yijun ZUO, Michigan State University.

2. Guanajuato, Mexico, May 2000. Invited paper session on "Shape analysis and random sets." Fifth World Congress of Bernoulli Society and Institute of Mathematical Statistics. Session speakers: Fred BOOKSTEIN, University of Michigan, Keith WORSLEY, McGill University, Merilee HURN, University of Bath.

3. Sherbrooke, June 1998. Invited paper session on "The statistics of shape." Statistical Society of Canada Annual Meeting. Session Speakers: Keith WORSLEY, McGill University, Ian DRYDEN, University of Leeds, Huiling LE, Nottingham University. Discussion by organiser.

CONFERENCE PAPERS AND TALKS

1. Toronto, Ontario, June 2011. "Multivariate analysis of data in curved shape spaces." Invited talk at the International Workshop on Perspectives on High-Dimensional Data Analysis at the Fields Institute.

2. Toronto, March 2010. "Dynamic random graph modeling and applications in the UK 2001 foot-and-mouth epidemic." Joint full day special seminar at the Center for Disease Modelling. Given jointly with Shoja Chenouri and Yasaman Hosseinkashi.

3. Windsor, Ontario, December 2009. "Dynamic random graph modelling and applications in the UK 2001 foot and mouth epidemic." Invited talk at the Winter Meeting of the Canadian Mathematical Society.

4. University of Tasmania, September 2008. "Cockroaches and thylacines: the hazards of species extinction."

5. University of Guelph, October 2007. "Modelling covariance kernels for nonstationary random fields."

6. St.Augustine, Florida, November 2005. "Form analysis using landmarks." Plenary Lecture at Energy Minimization Methods in Computer Vision and Pattern Recognition 2005.

7. Daydream Island, Queensland,Australia, July 2005. "Eigenfunction methods for estimation with random fields." Conference on Stochastic Modelling of Complex Systems 2005.

8. Tampere, Finland, June 2005. "A nonparametric multivariate multisample test." Invited talk at the Workshop on Nonparametric Statistical Methods.

9. Toronto, Ontario, August 2004. "Eigenfunction methods for estimation with random fields." Invited talk at the Joint Statistical Meetings.

10. University of Waterloo, November 2003. "The compassionate computer: Alec Aitken and his significance for statistics."

11. Halifax, NS, June 2003, Invited talk at the Statistical Society of Canada Annual Meeting, "Modelling the shapes of random curves."

12. University of Florida, Invited talk at the IMS Workshop on Imaging, Classification and Clustering, January, 2002, "The statistical analysis of dynamic curves and sections."

13. Institute of Statistical Mathematics, Japan, May 2001, "The statistical analysis of dynamic curves and sections."

14. University of Tokyo, Japan, May 2001, "Likelihood tilting."

15. Chiba University, Japan, May 2001, "Likelihood tilting."

16. University of Otago, New Zealand, August 2000, "Anomalous solutions in estimation."

17. University of Melbourne, Australia, August 2000, "Anomalous solutions in estimation."

18. Paul Sabatier University, France, February 2000, "The geometrical theory of estimating functions."

19. Paul Sabatier University, France, February 2000, "Assessing the importance of landmarks in shape analysis."

20. University of Nottingham, UK, February 2000, "Assessing the importance of landmarks in shape analysis."

21. Kingston, Ontario, December 1998, "The analysis of random shapes." Invited talk at the Canadian Mathematical Society Winter Meeting.

22. York University, October 1998, "The analysis of random shapes."

23. University of Guelph, October 1998, "Eliminating multiple root problems in estimation."

24. Sherbrooke, PQ, June 1998, "Some issues in shape analysis." Statistical Soc. of Canada Annual Meeting.

25. Istanbul, Turkey, August 1997, "Q-mode analysis using simplex shapes." Invited talk at the International Statistical Institute, 51st Session.

26. University of Auckland, August 1996, "Multiple roots of estimating functions."

27. University of Melbourne, August 1996, "Multiple roots of estimating functions."

28. Athens, Georgia, March 1996, "Multiple roots of estimating functions." Invited talk at the Symposium on Estimating Functions.

29. Leeds, UK, April 1995, "Shape metrics and Frobenius norms." Invited talk at the conference on Current Issues in Statistical Shape Analysis.

30. McMaster University, October 1994, "Decomposing geometrical statistics: a safari guide for hunting Jurassic dinosaurs."

31. Banff, BC, May 1994. "Multidimensional medians arising from geodesics on graphs." Statistical Society of Canada Annual Meeting.

32. Pennsylvania State University, April 1993, "Nonparametric Neymann-Scott problems: telescoping product methods."

33. John Hopkins University, January 1993, "Nonparametric Neymann-Scott problems: telescoping product methods."

34. Boston, Mass., August 1992, "Geometric theory of estimating functions." Invited talk at the Joint Meetings of ASA, IMS and Biometric Society.

35. University of Waterloo, June 1992, "Drunkard's walk and gambler's ruin."

36. University of Western Ontario, April 1992, "Reconstructing convex bodies from projected images."

37. University of Chicago, November 1991, "Projected likelihoods for semi-parametric models."

38. Waterloo, August 1991, "Projected likelihoods for semi-parametric models." Invited paper at Recent Concepts in Statistical Inference. A Symposium to Honour Prof. V.P. Godambe.

39. Winnipeg, Manitoba, January 1991, "Life, Shakespeare and other improbable things." Statistical Association of Manitoba.

40. Uppsala, Sweden, August 1990, "Stability measures for spaces of inference functions." Second World Congress of IMS and Bernoulli Society.

41. Niagara-on-the-Lake, Ontario, June 1990, "An application of estimating functions to image processing." Invited talk at the Niagara Workshop on Likelihood Methods and Stochastic Modeling.

42. Princeton, New Jersey, April 1990, "Reconstructing convex bodies from random projected images." Invited talk at Wilks Workshop on Shape Theory.

43. University of Manitoba, February 1990, "Statistical reconstruction of convex sets from projected images."

44. University of Waterloo Pure Math Club, November 1989, "Statistical geometry and stereometric inference."

45. University of Winnipeg, October 1989, "Inference functions and data based methods."

46. University of Manitoba, October 1989, "Inference functions and data based methods."

47. Ottawa, Ontario, June 1989, "Orthogonal stability of inference functions." Statistical Society of Canada Annual Meeting.

48. Cambridge University, April 1989, "Further thoughts on statistical inference functions."

49. Rutgers University, March 1989, "Some observations on data reduction and the principle of sufficiency."

50. Victoria, British Columbia, June 1988, "Methods for controlling the sensitivity of inference functions." Statistical Society of Canada Annual Meeting.

51. Canberra, Australia, May 1988, "Orthogonality and the inferential separation of parameters." National Mathematical Sciences Congress of Australia.

52. San Francisco, August 1987, "A survey of shape statistics." Invited paper at the Joint Meetings of ASA, IMS and Biometric Society.

53. Princeton, New Jersey, May 1987, "Estimating the location and shape of a convex set." Workshop on Shape Theory.

54. York University, March 1987, "Statistical inference functions."

55. University of Toronto, April 1986, "Mulling the muddle of multivariate middles."

56. University of Stockholm, November 1985, "Reconstructing convex sets: applications of geometric probability."

57. University of Copenhagen, November 1985, "Reconstructing convex sets: applications of geometric probability."

58. Aarhus University, October 1985, "Modeling heterogeneous observations: the Scylla and Charybdis of empirical Bayes."

59. University of London, October 1985, "Modeling heterogeneous observations: the Scylla and Charybdis of empirical Bayes."

60. Odense University, October 1985, "Hotelling points and spatial medians."

61. Winnipeg, Manitoba, June 1985, "Patterns and shapes in some Bronze Age archaeological data." Invited talk at the Statistical Society of Canada Annual Meeting.

62. McMaster University, March 1984, "Inference and outlier detection for outlier models and general Dixon mechanisms."

63. University of Western Ontario, November 1983, "Decomposition into components of processes whose marginals are mixtures."

64. Berkeley, California, June 1983, "Estimating a gaussian starburst through a poisson veil." Neyman-Kiefer Memorial Conference.

GRADUATE SUPERVISION

Doctoral Students:

1. Yasaman Hosseinkashi, "Statistical Inference on Stochastic Graphs," 2011.

2. Shoja'eddin Chenouri, "Multivariate Robust Nonparametric Inference Based on Data Depth," 2004.

3. Zejiang Yang, "Multiple Roots of Estimating Functions and Applications," 2000.

4. Michael Lewis, "Exploratory Analysis of the Shape of Two-Dimensional Images," 1996.

5. David Long, "Estimating Function Methods for Spatial Binary Data," 1992.

Master's Students:

1. Jiaxi Liang, M. Math. Thesis 2011.

2. Yuxin Zhang, M. Math. Essay 2010.
3. Gudrun Wessel, M. Math. Thesis 1994.
4. Rita Sandhu, M. Math. Essay 1993.
5. Gastao Gomez, M. Math. Thesis 1991.
6. Peter Found, M. Math. Essay 1990.
7. David Long, M. Math. Essay 1988.
8. Gary Lee, M. Math. Essay 1988.
9. Paul Comeau, M. Math. Essay 1987.
10. Toby Entz, M. Math. Essay 1985.
11. Andy Lee, M. Math. Essay 1983.

MATHEMATICS COMPETITION ACTIVITIES

1. Chair, International Mathematical Olympiad Committee of the CMS, 2008–present.

2. Leader and co-coach for the Canadian team for the International Mathematical Olympiad in Athens, Greece, July 4-18, 2004.

Team member	*Hometown*	*Result*
Jacob Tsimerman	Toronto	Gold medal (one of four in world with perfect score)
János Kramár	Toronto	Bronze medal
Oleg Ivrii	Toronto	Honourable mention
David Rhee	Edmonton	Honourable mention
Peng Shi	Toronto	Bronze medal
Yufei Zhao	Toronto	Broze medal

3. Leader and co-coach for the Canadian team at the International Mathematical Olympiad in Washington, DC, USA, July 3-14, 2001.

Team member	*Hometown*	*Result*
Daniel Brox	Vancouver	Gold medal
Paul Cheng	Vancouver	Bronze medal
Liang Hong	Toronto	Bronze Medal
Nima Kamoosi	Vancouver	Bronze medal
Roger Mong	Toronto	Bronze medal
Shu Niu	Vancouver	

4. Deputy Leader and co-coach for the Canadian team at the International Mathematical Olympiad in Taejon, South Korea, July 15-24, 2000.

Team member	*Hometown*	*Result*
David Arthur	Toronto	Gold medal (top 10 in world)
Daniel Brox	Vancouver	Silver medal
Denise Cheung	Toronto	Honourable Mention
Keon Choi	Toronto	Bronze Medal
David Goodman	Winnipeg	
David Pritchard	Scarborough	Silver Medal

5. Leader and co-coach for the Canadian team at the International Mathematical Olympiad in Taipei, Taiwan, July 10-21, 1998.

Team member	*Hometown*	*Result*
Adrian Birka	Niagara Falls, Ont.	
Adrian Chan	Toronto, Ont.	Gold medal
Jimmy Chui	Willowdale, Ont.	Bronze medal
Mihaela Enachescu	Westmount, PQ	Silver medal
Jessie Lei	Windsor, Ont.	Honourable mention
Adrian Tang	Scarborough, Ont.	Bronze medal

6. Leader observer and co-coach for the Canadian team at the International Mathematical Olympiad Mar del Plata, Argentina, July 18-31, 1997.

Team member	*Hometown*	*Result*
Adrian Birka	Niagara Falls, Ont.	
Sabin Cautis	North York, Ont.	Bronze medal
Adrian Chan	Toronto, Ont.	Silver medal
Byung Kyu Chun	Edmonton, Alta.	Silver medal
Jimmy Chui	Willowdale, Ont.	Honourable mention
Mihaela Enachescu	Westmount, PQ	Bronze medal

7. Co-coach of the Waterloo Putnam Team for the William Lowell Putnam Competition 1986-2004.

Year	*Ranking*	*Team Members*	*Co-coach*
2004	4^{th} place	R. Furmaniak, O. Bormashenko, M. Lipnowski	I. VanderBurgh
2003	6^{th} place	L. Demasi, R. Furmaniak, O. Bormashenko	D. Brown
2002	7^{th} place	K. Yeats, S. Niu, L. Demasi	I. VanderBurgh
2001	6^{th} place	B. Chun, S. Niu, D. Nicholson	I. VanderBurgh
2000	6^{th} place	S. Cautis, J. Kamnitzer, R. Hoshino	I. VanderBurgh
1999	1^{st} place	S. Cautis, D. Kisman, D. Cheung	
1998	5^{th} place	S. Cautis, D. Kisman, S. Yazdani	
1997	10^{th} place	D. Cheung, R. Hoshino, D. Kisman	I. Goulden
1996	8^{th} place	K. Purbhoo, J. Bell, S. Yazdani	I. Goulden
1995	12^{th} place	K. Purbhoo, J. Bell, F. Latour	I. Goulden
1994	5^{th} place	I. Goldberg, P. Milley, K. Purbhoo	M. Thompson
1993	8^{th} place	I. Goldberg, D. Brown, P. Milley	M. Thompson
1992	3^{rd} place	D. Brown, I. Goldberg, D. Birsan	M. Thompson, P. Kenderov
1991	2^{nd} place	C. Springer, D. Brown, I. Goldberg	B. Forte
1990	3^{rd} place	C. Springer, D. Brown, D. Birsan	B. Forte
1989	3^{rd} place	C. Springer, S. Smith, G. Hazenberg	B. Forte
1988	4^{th} place	F. D'Ippolito, C. Springer, M.-T. Vo	B. Forte
1987	23^{rd} place	B. Feir, G. Hazenberg, S. Siu	B. Forte, C. Russo
1986	9^{th} place	Y.Y. Du, E. Veach, M.-T. Vo	K. Davidson, M. Albert

8. Coordinator for Problem 1 at the 1995 International Mathematical Olympiad, York University.