

CURRICULUM VITAE

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Position held: Associate Professor
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Department: Computer Science
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Fields of interest: combinatorics, graph theory, algorithm design and analysis

Higher Education:

Degree	University	Subject	Year
B. Sc.:	Toronto	Mathematics	1965
M. Sc.:	Toronto	Mathematics	1966
Ph. D.:	Toronto	Mathematics	1971

Teaching and Research Experience:

Position	Date	Department	Institution
Full Professor	2000-	Computer Science	UQAM
Associate Professor	1988-2000	Computer Science	UQAM
Associate Professor	1981-1988	Computer Science	Univ. of Western Ontario
Research Associate	1980-1981	Computer Science	Univ. of Waterloo
Senior Researcher	1977-1980	Computing Centre	USSR Academy of Sciences
Postdoctoral	1975-1977	Mathematics	Univ. of Moscow
Assistant Professor	1973-1975	Mathematics	Univ. de Bordeaux I
Assistant Professor	1971-1973	Combinatorics	Univ. of Waterloo

Government grant held: 14000\$ per year, NSERC.

Students supervised: 3 M. Sc. obtained, 2 Ph. D.s obtained: Axel Pavillet, on Voronoï diagrams and Mohamed Abdo on Gray codes.

Number of publications:

refereed journal papers:	38
refereed articles in conference proceedings:	14
other contributions (including 2 contributions to books)	32
submitted	2
in preparation	0

Complete list of publications

Refereed journal papers

- T. R. Walsh, A. Giorgetti and A. Mednykh, *Enumeration of Unrooted Orientable Maps of Arbitrary Genus by Number of Edges and Vertices*, Discrete Mathematics, in press.
- A. Gagarin, Gilbert Labelle, P. Leroux and T. Walsh, *Structure and Enumeration of Two-connected Graphs with Prescribed Three-connected Components*, Advances in Applied Mathematics 43 (2009), pp. 46-74.
- V. Vajnovszki and T.R. Walsh, *A loopless two-close Gray-code algorithm for listing k-ary Dyck words*, Journal of Discrete Algorithms, Vol. 4, No. 4 (2006) 633-648.
- V.A. Liskovets and T.R. Walsh, *Counting Unrooted Maps on the Plane*, Advances in Applied Mathematics 36 (2006) 364-387.
- T.R. Walsh, *Efficient enumeration of sensed planar maps*, Discrete Mathematics 293 (2005) 263-289.
- V.A. Liskovets and T.R. Walsh, *Enumeration of Unrooted Loopless Maps*, European J. Combin. 26 (2005) 651-663.
- V.A. Liskovets and T.R. Walsh, *Enumeration of Eulerian and unicursal planar maps*, Discrete Mathematics 282, 2004, 209-221.
- T.R. Walsh, *Gray codes for involutions*, The Journal of Combinatorial Mathematics and Combinatorial Computing 36, 2001, 95-118.
- T.R. Walsh, *Loop-free sequencing of bounded integer compositions*, The Journal of Combinatorial Mathematics and Combinatorial Computing 33, 2000, 323-345.
- L. Koganov, V. Liskovets and T.R. Walsh, *Total vertex enumeration in rooted planar maps*, Ars Combinatoria 54, 2000, 149-160.
- T.R. Walsh, *Generation of well-formed parenthesis strings in constant worst-case time*, The Journal of Algorithms 29, 1998, 165-173.
- T.R. Walsh, *The generalized Towers of Hanoi for space-deficient computers and forgetful humans*, The Mathematical Intelligencer, Volume 20, No. 1, 1998, 32-38.
- T.R. Walsh, *Worst-case analysis of Read's chromatic polynomial algorithm*, Ars Combinatoria 46, 1997 145-151.
- R.W. Robinson and T.R. Walsh, *Inversion of Cycle Index Series Relations for 2- and 3-connected Graphs*, Journal of Combinatorial Theory, Series B, Vol. 57, No. 2, 1993, 289-308.

T.R. Walsh, *Efficient Axis-Translation by Blocks of Binary Digital Pictures in Linear Quadtree Representation*, Computer Vision, Graphics and Image Processing, Vol. 41, No. 3, 1988, 282-292.

E.W. Elcock, I. Gargantini and T.R. Walsh, *Triangular Decomposition*, Image and Vision Computing, Vol. 5, No. 3, 1987, 225-231.

M.V.S. Ramanath and T.R. Walsh, *Enumeration and Generation of a Class of Regular Digraphs*, Journal of Graph Theory, Vol. 11, No. 4, 1987, 471-479.

H.H. Atkinson, I. Gargantini and T.R. Walsh, *Filling by Quadrants or Octants*, Computer Vision, Graphics and Image Processing, Vol. 33, 1986, 138-155.

I. Gargantini, T.R. Walsh and O.L.Wu, *Viewing Transformations of Voxel-Based Objects via Linear Octrees*, IEEE Computer Graphics and Applications, Vol. 10, No. 6, 1986, 12-21.

H.H. Atkinson, I. Gargantini and T.R. Walsh, *Counting Regions, Holes and their Nesting Levels in Time Proportional to the Border*, Computer Vision, Graphics and Image Processing, Vol. 29, 1985, 196-215.

T.R. Walsh, *On the size of Quadtrees Generalized to d-Dimensional Binary Pictures*, Computers and Mathematics with Applications, Vol. 11, No. 11, 1985, 1089-1097.

T.R. Walsh, *How Evenly should one Divide to Conquer Quickly?*, Information Processing Letters, Vol. 19, 1984, 203-208.

T.R. Walsh, *A Polynomial Algorithm for Counting Rooted Toroidal Maps*, Ars Combinatoria, Vol. 16, 1983, 49-56.

V.A. Liskovets and T.R. Walsh, *The Enumeration of Non-Isomorphic 2-Connected Planar Maps*, Canadian Journal of Mathematics, Vol. 35, No. 3, 1983, 417-435.

T.R. Walsh, *Generating Non-Isomorphic Maps without storing them*, SIAM Journal on Algebraic and Discrete Methods, Vol. 4, No. 2, 1983, 161-178.

T.R. Walsh, *Iteration Strikes Back (at the Cyclic Towers of Hanoi)*, Information Processing Letters, Vol. 16, No. 2, 1983, 91-93.

T.R. Walsh, *The Towers of Hanoi Revisited: moving the rings by counting the moves*, Information Processing Letters, Vol. 15, No. 2, 1982, 64-67.

T.R. Walsh, *Counting Non-Isomorphic 3-Connected Planar Maps*, Journal of Combinatorial Theory, Series B, Vol. 32, No. 1, 1982, 33-44.

T.R. Walsh, *Counting Unlabelled 3-Connected and Homeomorphically Irreducible 2-Connected Graphs*, Journal of Combinatorial Theory, Series B, Vol. 32, No. 1, 1982, 12-32.

T.R. Walsh, *Counting Labelled 3-Connected and Homeomorphically Irreducible 2-Connected Graphs*, Journal of Combinatorial Theory, Series B, Vol. 32, No. 1, 1982, 1-11.

T.R. Walsh, *Generating Non-Isomorphic Maps by Computer (4-page note in Russian)*, Doklady Akademii Nauk SSSR, Vol. 255, No. 2, 1980, 301-304. English translation in Soviet Math. Doklady, Vol. 22, 1980, 705-709.

T.R. Walsh, *Counting Three-Connected Graphs (4-page note in Russian)*. Doklady Akademii Nauk SSSR, Vol. 247, No. 2, 1979, 297-301. English translation in Soviet Math. Doklady, Vol. 20, 1979, 714-718.

T.R. Walsh and E.M. Wright, *On the k -Connectedness of Unlabelled Graphs*, Journal of the London Math. Society (2), Vol. 18, 1978, 397-402.

T.R. Walsh, *Hypermaps vs. Bipartite Maps*, Journal of Combinatorial Theory, Series B, Vol. 18, 1975, 155-163.

A.B. Lehman and T.R. Walsh, *Counting Rooted Maps by Genus, Part III: Non-Separable Maps*. Journal of Combinatorial Theory, Series B, Vol. 18, 1975, 222-259.

A.B. Lehman and T.R. Walsh, *Counting Rooted Maps by Genus, Part II*, Journal of Combinatorial Theory, Series B, Vol. 13, 1972, 122-141.

A.B. Lehman and T.R. Walsh, *Counting Rooted Maps by Genus, Part I*, Journal of Combinatorial Theory, Series B, Vol. 13, 1972, 192-218.

T.R. Walsh, *Characterizing the Vertex-Neighbourhoods of Semi-Regular Polyhedra*, Geometriae Dedicata, Vol. 1, No. 1, 1972, 117-123.

refereed papers in conference proceedings

T. R. Walsh, *Counting Maps on Doughnuts*, invited talk at the 2010 GASCom conference at UQÀM, Theoretical Computer Science, in press.

T.R. Walsh, *A biased survey of map enumeration results*. Invited talk. Proceedings of the 10th WSEAS Conference on Applied Mathematics in Dallas, Texas, Nov 1-3 2006, 325-331.

T.R. Walsh, *The number of edge 3-colourings of the n -prism* (3 pages), Proceedings of The Workshop of Graph Colouring and Applications, Université du Québec à Montréal, May 1997, Centre de Recherches Mathématiques, Proceedings and Lecture notes, Vol. 23 (1999), 127-129.

T.R. Walsh, *The cost of radio-colouring paths and cycles* (3 pages), Proceedings of The Workshop of Graph Colouring and Applications, Université du Québec à Montréal, May 1997, Centre de Recherches Mathématiques, Proceedings and Lecture notes, Vol. 23 (1999), 131-133

P. Auger and T.R. Walsh, *Theoretical and Experimental Comparison of Four Binary-Tree Generation Algorithms*, Proceedings of the 24th South-Eastern Conference on Computing, Graph Theory and Combinatorics, Florida Atlantic University, Feb. 1993, Congressus Numerantium, Vol. 93, 1993, 99-109.

addendum to above article, *Congressus Numerantium*, Vol. 112, 1995, 3-5.

R.W. Robinson and T.R. Walsh, *Cycle Index Series Relations for Counting 2- and 3-Connected Graphs*, Conférence donnée dans le cadre du colloque sur les séries formelles et combinatoire algébrique, aux ateliers franco-québécois, Publications du LACIM numéro 10, mai 1992, 227-241.

T. Chan, I. Gargantini and T.R. Walsh, *Conversion and Integration of Boundary Representations with Octrees*, Graphics Interface Conference '89, London, Ontario, 1989, 203-210.

V. A. Liskovets and T. R. Walsh, *Ten Steps to Counting Planar Graphs*, Proc. 18th Southeastern Conference on Computing, Graph Theory and Combinatorics, Florida Atlantic University, *Congressus Numerantium*, Vol. 60, 1987, 269-278.

I. Gargantini, T.R. Walsh and O.L Wu, *Displaying a Voxel-Based Object via Linear Octrees*, Proc. SPIE, Medicine XIV-PACS IIV, Vol. 626, Newport Beach, Ca., 1986, 460-466.

I. Gargantini, M.V.S. Ramanath and T.R. Walsh, *Linear Octrees: from Data Acquisition or Creation to Display*, Proc. NCGA, Technical Sessions, Anaheim, Ca., 1986, 615-621.

A.K. Dewdney and T.R. Walsh, *A Methodology for Average-Time Testing of Exact and Approximate Graph Algorithms*, Proc. 16th South-Eastern Conference on Computing, Graph Theory and Combinatorics, Florida Atlantic University, Feb. 1985, *Congressus Numerantium* Vol. 47, 1985, 273-284.

T.R. Walsh, *A Case for Iteration*, Proc. 14th South-Eastern Conference on Computing, Graph Theory and Combinatorics, Florida Atlantic University, Feb. 1983, *Congressus Numerantium*, Vol. 40, 38-43.

A.K. Dewdney, T.R. Walsh and D. Wehlau, *Average-Time Testing of Satisfiability Algorithms*, Proc. 14th South-Eastern Conference on Computing, Graph Theory and Combinatorics, Florida Atlantic University, Feb. 1983, *Congressus Numerantium*, Vol. 39, 305-325.

contributions to books

T.R. Walsh, *Euclidean travelling salesman*, Kluwer Encyclopaedia of Mathematics (online version <http://eom.springer.de/E/e120200.htm>).

T.R. Walsh, *Trier vite pour chercher vite*, Mathématiques d'hier et d'aujourd'hui, sous la direction de Richard Pallascio et de Gilbert Labelle, collection Astroïde, Modulo éditeur 2000, p.151-156.

other contributions

Timothy Walsh, *Indiscrete Mathematics*, Unpublished monograph.

Valery Liskovets and Timothy Walsh, Enumeration of unrooted maps in the plane, Technical report No. 2005-01, Department of Computer Science, Université du Québec À Montréal, February 2005 (20 pages).

Valery Liskovets and Timothy Walsh, Counting unrooted loopless planar maps, Technical report No. 2004-02, Department of Computer Science, Université du Québec À Montréal, February 2004 (11 pages).

Timothy R. Walsh, Efficient enumeration of sensed planar maps, Technical report No. 2004-01, Department of Computer Science, Université du Québec À Montréal, February 2004 (25 pages).

Vincent Vajnovszki and Timothy Walsh, A loopless two-close Gray-code algorithm for listing k -ary Dyck words, Research report No 03-01, Department of Computer Science, Université du Québec À Montréal, March 2003 (12 pages).

T.R. Walsh, *Generating Gray codes in $O(1)$ worst-case time per word*, Lecture Notes in Computer Science 2731, Proceedings of the 4th International Conference, Discrete Mathematics and Theoretical Computer Science 2003, Dijon, France, July 7-12, 2003, Springer-Verlag, New York, 2003, p. 73-88 (invited talk).

V.A. Liskovets and T.R. Walsh, *Enumeration of eulerian and unicursal planar maps*, Technical report No. 2002-03, Department of Computer Science, Université du Québec À Montréal, May 2002 (12 pages).

A. Pavillet, *Calcul optimum d'un diagramme de Voronoï à base de cercles avec un algorithme à balayage par cercle*, M.Sc. Thesis, Université du Québec À Montréal, 2000.

T.R. Walsh, *Loop-free sequencing of bounded integer compositions*, Technical report No 99-06, Department of Computer Science, Université du Québec à Montréal, August 1999(17 pages),

L. Koganov, V. Liskovets and T.R. Walsh, *Total vertex enumeration in rooted planar maps*, Technical report No 99-05, Department of Computer Science, Université du Québec à Montréal, August 1999 (11 pages).

T.R. Walsh, *Completely Non-Plussed*, The Mathematical Intelligencer, Volume 19, No. 4, 1997, p.77.

T.R. Walsh, *A Gray code for involutions with a given number of fixed points*, Research report 10, Department of Computer Science, Université du Québec à Montréal, July 1997 (13 pages).

T.R. Walsh, *A Gray code for all length- n involutions*, Research report 9, Department of Computer Science, Université du Québec à Montréal, July 1997 (11 pages).

T.R. Walsh, *A Gray code for fixed-point-free involutions*, Research report 5, Department of Computer Science, Université du Québec à Montréal, January 1997 (10 pages).

I. Gargantini, T.R. Walsh and T. Yiu, *A theoretical result on star-shaped polygons and its application to triangulation*, Proceedings of the 7th International Conference on Engineering Computer Graphics and Descriptive Geometry, Cracow, Poland, July 1996, 182-186 (reviewed by the Scientific Committee for the Conference but not by an external referee).

T.R. Walsh, *A non-recursive formula for a mahonian number and an efficient algorithm for computing one*, Research report 4, Department of Computer Science, Université du Québec à Montréal, August 1995 (12 pages).

T. R. Walsh, *Worst-case analysis of Ronald Read's Chromatic Polynomial Algorithm*, Research report 3, Department of Computer Science, Université du Québec à Montréal, August 1995 (5 pages).

T.R. Walsh, *Bijjective average-case analysis of an algorithm which generates balanced parenthesis systems*, research report 2, Department of Computer Science, Université du Québec à Montréal, August 1995 (3 pages).

T.R. Walsh, *A simple sequencing and ranking method that works on almost all Gray codes*, Research report 243, Department of Mathematics and Computer Science, Université du Québec à Montréal, April 1995 (53 pages).

R. Robidoux, *Énumération des graphes planaires*, M. Sc. Thesis, Department of Mathematics and Computer Science, University of Quebec in Montreal, Montreal, Quebec, Canada, February 1992.

W. Mok, *Efficient Isometries of Binary Digital Pictures by Blocks in Linear Quadtree Representation*, M. Sc. Thesis, Department of Computer Science, The University of Western Ontario, London, Canada, May 1990.

T.R. Walsh, *A conjectured ratio of central and bicentral unlabelled n -vertex trees*, A Collection of Open Problems, Combinatorial Mathematics: Proceedings of the Third International Conference, Annals of the New York Academy of Sciences, Vol. 555, 1989, p. 432.

T.R. Walsh, *A Runoff Program for Accessing the Diablo ECS Printer from any Terminal*, Technical Report No. 138, Department of Computer Science, The University of Western Ontario, July 1985.

T.R. Walsh, *Cracking Safecracker*, Journal of Recreational Mathematics, Vol. 17, No. 4, 1985, 283-288.

T.R. Walsh, *The Complexity of Linear Quadtrees*, Proc. Janos Bolyai Colloquium on the Theory of Algorithms, Pecs, Hungary, 1984, Vol. 44, 1984, 425-430.

T.R. Walsh, *A Collection of Iterative Algorithms for Recursive Problems*, Technical Report No. 106, Department of Computer Science, The University of Western Ontario, May 1983.

T.R. Walsh, *The Busy Beaver on a One-Way Infinite Tape*, SIGACT News, Vol. 14, No. 1, 1982, 38-43.

T.R. Walsh, 7 abstracts, Graphs Theory Newsletter.

T.R. Walsh, *The Complexity of Flow Algorithms (survey)*, Journées de Combinatoire et Informatique, Université de Bordeaux I (1973), 353-362.

T.R. Walsh, *Combinatorial Enumeration of Non-Planar Maps*, Ph.D. Thesis, University of Toronto, 1971.

submitted

T.R. Walsh, *Generating Nonisomorphic Maps without Storing them II: Three Decades Later*, submitted for publication.

T.R. Walsh and A. Giorgetti, *Efficient Enumeration of Rooted Maps of Given Orientable Surface by Number of Vertices and Faces*, submitted for publication.

in preparation