

Anna LUBIW

School of Computer Science
University of Waterloo
Waterloo, Ontario
Canada. N2L 3G1

alubiw@uwaterloo.ca

<http://www.cs.uwaterloo.ca/~alubiw/>

Citizenship: Canadian

Areas of Interest: computational geometry, graph drawing, graph theory algorithms, music information retrieval, combinatorial optimization, complexity theory

Degrees

- 1986, Ph.D., Department of Computer Science, University of Toronto, Toronto, Ontario. Thesis: *Orderings and Some Combinatorial Optimization Problems with Geometric Applications*. Supervisors: R. Mathon and S. Cook; thesis work done with J. Edmonds.
- 1982, M.Math, Department of Combinatorics and Optimization, University of Waterloo, Waterloo, Ontario. Thesis: *Γ -Free Matrices*. Supervisor: J. Edmonds.
- 1979, B.Sc., Math and Computer Science, University of Toronto, Toronto, Ontario.

Employment

- July 2004—present, Professor, School of Computer Science, University of Waterloo, Waterloo, Ontario. (3/4 time)
- August 2009—June 2010, Visiting Researcher, MIT Computer Science and Artificial Intelligence Laboratory.
- July 1993—June 2004, Associate Professor, Department of Computer Science, University of Waterloo, Waterloo, Ontario. (3/4 time from Jan. 1995. Maternity leave Sept.—Dec. 1994 and Jan.—June 1997.)
- August 2001—July 2002, Visiting Researcher, University of Arizona, Department of Computer Science.
- January 1994—April 1994, Visiting Researcher, DIMACS.
- September 1993—December 1993, Visiting Researcher, University of Wisconsin, Computer Sciences Department.
- August 1987—June 1993, Assistant Professor, Department of Computer Science, University of Waterloo, Waterloo, Ontario.
- Sept. 1986—July 1987, NSERC (Natural Sciences and Engineering Research Council of Canada) Postdoctoral Fellowship, Mathematical Institute of the Hungarian Academy of Sciences, Budapest, Hungary.
- Jan. 1986—Aug. 1986, NSERC Postdoctoral Fellowship, Department of Computer Science, University of California, Berkeley, CA.
- June 1979—Aug. 1980, employee in computer aided design of integrated circuits, Bell Northern Research, Ottawa, Ontario.

Awards

- ACM Distinguished Scientist, 2009.
- NSERC PostDoctoral Fellowship, 1986–1987.

Publications

(a) Published in Refereed Journals

- Shortest Paths Avoiding Forbidden Subpaths, M. Ahmed, A. Lubiw, accepted to *Networks*, 2011. (work of M. Ahmed’s PhD thesis)
- Bounded-Degree Polyhedronization of Point Sets, Gill Barequet, Nadia Benbernou, David Charlton, Erik Demaine, Martin Demaine, Mashhood Ishaque, Anna Lubiw, Andre Schulz, Diane Souvaine, Godfried Toussaint and Andrew Winslow, accepted to *Computational Geometry: Theory and Applications*, 2011.
- Morphing Orthogonal Planar Graph Drawings, T. Biedl, A. Lubiw, M. Petrick and M. Spriggs, accepted (conditional) to *Transactions on Algorithms*, 2011.
- The Shape of Orthogonal Cycles in Three Dimensions, with Giuseppe Di Battista, Ethan Kim, Giuseppe Liotta, Anna Lubiw, Sue Whitesides, accepted to *Discrete and Computational Geometry*, 2011.
- Shortest Descending Paths: Towards an Exact Algorithm, M. Ahmed, A. Lubiw, *International Journal on Computational Geometry*, Volume 21, No. 4, 43–466, 2011. (work of M. Ahmed’s PhD thesis)
- Morphing Planar Graph Drawings with Bent Edges, Anna Lubiw and Mark Petrick, *Journal of Graph Algorithms and Applications*, Volume 15, No. 2, 205–287, 2011. (work with PhD student Mark Petrick)
- Modelling Gateway Placement in Wireless Networks: Geometric k-Centres of Unit Disc Graphs, S. Durocher, K.R. Jampani, A. Lubiw, L. Narayanan, *Computational Geometry: Theory and Applications*, Volume 44, No. 5, 286–302, 2011.
- A Lower Bound on the Area of a 3-Coloured Disk Packing, P. Brass, F. Hurtado, B. Lafreniere, A. Lubiw, *International Journal on Computational Geometry*, Volume 20, No. 3, 341–360, 2010. (work of B. Lafreniere’s Master’s thesis)
- Approximation Algorithms for Shortest Descending Paths in Terrains, M. Ahmed, S. Das, S. Lodha, A. Lubiw, A. Maheshwari, S. Roy, *Journal of Discrete Algorithms*, Volume 8, No. 2, 214–230, 2010. (work of M. Ahmed’s PhD thesis)
- Morphing polyhedra with parallel faces: counterexamples, T. Biedl, A. Lubiw, M. Spriggs, *Computational Geometry: Theory and Applications*, Volume 42, No. 5, 395–402, 2009. (invited to a special issue; work of M. Spriggs’s PhD thesis)
- Shortest descending paths through given faces, Mustaq Ahmed, Anna Lubiw, *Computational Geometry: Theory and Applications*, Volume 42, No. 5, 464–470, 2009. (invited to a special issue; work of M. Ahmed’s PhD thesis)
- Equiprojective polyhedra, M. Hasan, A. Lubiw, *Computational Geometry Theory and Applications*, Volume 40, Issue 2, 148–155, 2008.
- On simultaneous planar graph embeddings, P. Brass, E. Cenek, C.A. Duncan, A. Efrat, C. Erten, D. Ismailescu, S.G. Kobourov, A. Lubiw, and J.S.B. Mitchell, *Computational Geometry: Theory and Applications*, Volume 36, Issue 2, 117–130, 2007.
- Computing homotopic shortest paths efficiently, A. Efrat, S. Kobourov, A. Lubiw, *Computational Geometry: Theory and Applications*, Volume 35, Issue 3, 162–172, 2006.

- When can a net fold to a polyhedron? T. Biedl, A. Lubiw, J. Sun, Computational Geometry Theory and Applications, Volume 31, Issue 3, 207–218, 2005. (work of J. Sun’s Master’s thesis)
- Elastic labels around the perimeter of a map, C. Iturriaga, A. Lubiw, Journal of Algorithms 47, 14–39, 2003. (work of C. Iturriaga’s PhD thesis)
- Efficient visibility queries in simple polygons, P. Bose, A. Lubiw, J.I. Munro, Computational Geometry Theory and Applications, Volume 23, Issue 3, 313–335, 2002. (work of P. Bose’s Master’s thesis)
- Embedding problems for paths with direction constrained edges, G. Di Battista, G. Liotta, A. Lubiw, S. Whitesides, Theoretical Computer Science Volume: 289, Issue: 2, 897–917, 2002.
- Enumerating foldings and unfoldings between polygons and polytopes, E. Demaine, M. Demaine, A. Lubiw, J. O’Rourke, Graphs and Combinatorics 18, 93–104, 2002.
- A note on reconfiguring tree linkages: trees can lock, T. Biedl, E. Demaine, M. Demaine, S. Lazard, A. Lubiw, J. O’Rourke, S. Robbins, I. Steinu, G. Toussaint, S. Whitesides, Discrete Applied Math 117, 293–297, 2002.
- Locked and unlocked polygonal chains in 3D, T. Biedl, E. Demaine, M. Demaine, S. Lazard, A. Lubiw, J. O’Rourke, M. Overmars, S. Robbins, I. Steinu, G. Toussaint, S. Whitesides, Discrete and Computational Geometry 26, 283–287, 2001.
- Efficient algorithms for Petersen’s matching theorem, T. Biedl, P. Bose, E. Demaine, A. Lubiw, Journal of Algorithms 38, 110–134, 2001.
- A visibility representation for graphs in three dimensions, P. Bose, H. Everett, S. Fekete, M. Houle, A. Lubiw, H. Meijer, K. Romanik, G. Rote, T. Shermer, S. Whitesides, and C. Zelle. Journal of Graph Algorithms and Applications 2, no. 3, 1–16, 1998. (<http://www.cs.brown.edu/publications/jgaa/>)
- The rectangle of influence drawability problem, G. Liotta, A. Lubiw, H. Meijer, S. Whitesides, Computational Geometry Theory and Applications 10, 1–22, 1998.
- Pattern matching for permutations, P. Bose, J. Buss, A. Lubiw, Information Processing Letters 65, 277–283, 1998.
- The floodlight problem, P. Bose, L. Guibas, A. Lubiw, M. Overmars, D. Souvaine, J. Urrutia, International J. of Computational Geometry and Applications 7, 153–163, 1997.
- Visibility graphs of towers, P. Colley, A. Lubiw, J. Spinrad, Computational Geometry Theory and Applications 7, 161–172, 1997.
- Convergents of folded continued fractions, J.-P. Allouche, M. Mendes France, A. Lubiw, A. van der Poorten, J. Shallit, Acta Arithmetica 77, 77–96, 1996.
- Upward planar drawing of single source acyclic graphs, M. Hutton, A. Lubiw, SIAM J. on Computing 25, 291–311, 1996. (work of M. Hutton’s Master’s thesis)
- Dominating cliques in chordal graphs, D. Kratsch, P. Damaschke, A. Lubiw, Discrete Mathematics 128, 269–275, 1994.
- Distance visibility graphs, C. Coullard, A. Lubiw, International J. of Computational Geometry and Applications 2, 349–362, 1992.
- A weighted min-max relation for intervals, A. Lubiw, J. Combinatorial Theory B 53, 151–172, 1991.
- A lower bound for the integer element distinctness problem, A. Lubiw, A. Rácz, Information and Computation 94, 83–92, 1991.
- Non-crossing subgraphs in topological layouts, J. Kratochvíl, A. Lubiw, J. Nešetřil, SIAM J. of Discrete Math 4, 223–244, 1991.

- Short-chorded and perfect graphs, A. Lubiw, *J. Combinatorial Theory B* 51, 1991, 24–33.
- Counterexample to a conjecture of Szymanski on hypercube routing, A. Lubiw, *Information Processing Letters* 35, 57–61, 1990.
- The Boolean basis problem and how to cover some polygons by rectangles, A. Lubiw, *SIAM J. on Discrete Math.* 3, 98–115, 1990.
- A note on odd/even cycles, A. Lubiw, *Discrete Applied Math.* 22, 87–92, 1988/89.
- Doubly lexical orderings of matrices, A. Lubiw, *SIAM J. on Computing* 16, 854–879, 1987.
- Some NP-complete problems similar to graph isomorphism, A. Lubiw, *SIAM J. on Computing* 10, 11–21, 1981.

(c) Selected for Conference Proceedings

- Algorithms for Solving Rubik’s Cubes, Erik D. Demaine, Martin L. Demaine, Sarah Eisenstat, Anna Lubiw, Andrew Winslow, 19th Annual European Symposium on Algorithms (ESA), 2011, *Lecture Notes in Computer Science* 6942, 689–700, 2011.
- Testing Simultaneous Planarity when the Common Graph is 2-Connected, Bernhard Haeupler, Krishnam Raju Jampani, Anna Lubiw, 21st International Symposium on Algorithms and Computation (ISAAC), 2010, *Lecture Notes in Computer Science* 6507, 410–421, 2010.
- Simultaneous interval graphs, Krishnam Raju Jampani and Anna Lubiw, 21st International Symposium on Algorithms and Computation (ISAAC), 2010, *Lecture Notes in Computer Science* 6507, 206–217, 2010. (work of K.R. Jampani’s PhD thesis)
- Coverage with Transmitters in the Presence of Obstacles, Brad Ballinger, Nadia Benbernou, Prosenjit Bose, Mirela Damian, Erik D. Demaine, Vida Dujmovic, Robin Flatland, Ferran Hurtado, John Iacono, Anna Lubiw, Pat Morin, Vera Sacristan, Diane Souvaine, and Ryuhei Uehara, 4th Annual International Conference on Combinatorial Optimization and Applications (COCOA), 2010, *Lecture Notes in Computer Science* 6509, 1–15, 2010.
- The Simultaneous Membership Problem for Chordal, Comparability and Permutation Graphs, K.R. Jampani, A. Lubiw, *Symposium on Algorithms and Data Structures (WADS)*, 2009, *Lecture Notes in Computer Science* 5664, 387–398, 2009. (work of K.R. Jampani’s PhD thesis)
- Shortest Paths Avoiding Forbidden Subpaths, M. Ahmed, A. Lubiw, *Proceedings of the 26th International Symposium on Theoretical Aspects of Computer Science (STACS)*, 2009, *Leibniz International Proceedings in Informatics (LIPIcs)*, Vol. 3, 63–74, 2009. (work of M. Ahmed’s PhD thesis)
- Shortest Gently Descending Paths, M. Ahmed, A. Lubiw, A. Maheshwari, *Third Annual Workshop on Algorithms and Computation (WALCOM)*, 2009, *Lecture Notes in Computer Science* 5431, 59–70, 2009. (work of M. Ahmed’s PhD thesis; final version listed above)
- Modelling Gateway Placement in Wireless Networks: Geometric k-Centres of Unit Disc Graphs, with S. Durocher, K.R. Jampani, L. Narayanan, *Proceedings of the Fifth ACM SIGACT-SIGOPS International Workshop on Foundations of Mobile Computing (DIAL M-POMC)* 2008, ACM, 79–86, 2008. (final version listed above)
- Morphing Planar Graph Drawings with Bent Edges, with M. Petrick, *Topological and Geometric Graph Theory (TGGT)* 2008, *Electronic Notes in Discrete Mathematics*, Volume 31, 45–48, 2008.
- Cauchy’s theorem and edge lengths of convex polyhedra, with T. Biedl, M. Spriggs, *Workshop on Algorithms and Data Structures (WADS)* 2007, *Lecture Notes in Computer Science* 4619, F. Dehne, J-R. Sack and N. Zeh, eds., 2007, 398–409.

- Morphing orthogonal planar graph drawings, with M. Petrick and M. Spriggs, Proceedings of the 17th Annual ACM-SIAM Symposium on Discrete Algorithms (SODA) 2006, 222–230. (work of M. Petrick’s PhD thesis; final version listed above)
- Morphing planar graphs while preserving edge directions, with T. Biedl, M. Spriggs, Proceedings Graph Drawing 2005, Lecture Notes in Computer Science 3843, P. Healy, N. Nikolov, eds., 2006, 13–24. (work of M. Spriggs’s PhD thesis; final version listed above)
- Pattern matching in polyphonic music as a weighted geometric translation problem, with L. Tanur, Proceedings 5th International Conference on Music Information Retrieval (ISMIR), 2004, 289–296. (work of L. Tanur’s Master’s thesis)
- Angles and lengths in reconfigurations of polygons and polyhedra, with T. Biedl, M. Spriggs, Lecture Notes in Computer Science, Volume 3153, Mathematical Foundations of Computer Science 2004: 29th International Symposium, (MFCS), 2004, 748 - 759. (work of M. Spriggs’s PhD thesis)
- On simultaneous planar graph embeddings, with P. Brass, E. Cenek, C.A. Duncan, A. Efrat, C. Erten, D. Ismailescu, S.G. Kobourov, and J.S.B. Mitchell, Workshop on Algorithms and Data Structures (WADS), 2003. Lecture Notes in Computer Science 2748, F. Dehne, J.-R. Sack, M. Smid, eds., 2003, 243–255. (final version listed above)
- Touring a sequence of polygons, with M. Dror, A. Efrat and J. Mitchell, ACM Symp. on Theory of Computing (STOC), 2003, 473 – 482.
- Computing homotopic shortest paths efficiently, with A. Efrat and S. Kobourov, 10th Annual European Symposium on Algorithms; Algorithms - ESA 2002, R. Moehring, R. Raman, eds., Lecture Notes in Computer Science 2461, 2002, 411–423. (final version listed above)
- Enumerating foldings and unfoldings between polygons and polytopes, with E. Demaine, M. Demaine, J. O’Rourke, Proceedings of the Japan Conference on Discrete and Computational Geometry, Tokyo, Japan, November, 2000. (final version listed above)
- Orthogonal drawings of cycles in 3D space, with G. Di Battista, G. Liotta, S. Whitesides, Graph Drawing 2000, ed. Joe Marks, Lecture Notes in Computer Science 1984, Springer-Verlag, 2001, 272–283.
- Embedding problems for paths with direction constrained edges, with G. Di Battista, G. Liotta, S. Whitesides, The Sixth Annual International Computing and Combinatorics Conference, COCOON’2000, Australia, July 2000. (final version listed above)
- Elastic labels around the perimeter of a map, with C. Iturriaga, Workshop on Algorithms and Data Structures, WADS’99, ed. F. Dehne, A. Gupta, J.-R. Sack, R. Tamassia, Lecture Notes in Computer Science 1663, Springer-Verlag, 1999, 306–317. (work of C. Iturriaga’s PhD thesis; final version listed above)
- Efficient algorithms for Petersen’s matching theorem, with T. Biedl, P. Bose, and E. Demaine, Proc. ACM-SIAM Symp. on Discrete Algorithms, 1999, 130–139. (final version listed above)
- Locked and unlocked polygonal chains in 3D, with T. Biedl, E. Demaine, M. Demaine, S. Lazard, J. O’Rourke, M. Overmars, S. Robbins, I. Steinu, G. Toussaint, S. Whitesides, Proc. ACM-SIAM Symp. on Discrete Algorithms, 1999, 866–867. (final version listed above)
- Folding and one straight cut suffice, with E. Demaine and M. Demaine, Proc. ACM-SIAM Symp. on Discrete Algorithms, 1999, 891–892.
- Folding and cutting paper, with E. Demaine and M. Demaine, in Revised Papers from the Japan Conference on Discrete and Computational Geometry (JCDCG’98), ed. by J. Akiyama, M. Kano, and M. Urabe, Lecture Notes in Computer Science, volume 1763, 1998, pp. 104–117.

- Elastic labels: the two-axis case, with C. Iturriaga, *Graph Drawing 1997*, ed. G. DiBattista, *Lecture Notes in Computer Science 1353*, Springer-Verlag, 1997, 181–192. (work of C. Iturriaga’s PhD thesis)
- Recognizing rectangle of influence drawable graphs, with H. ElGindy, G. Liotta, H. Meijer, and S. Whitesides, *Graph Drawing 1994*, ed. R. Tamassia and I. Tollis, *Lecture Notes in Computer Science 894*, Springer-Verlag, 1995, 352–363. (final version listed above)
- Pattern matching for permutations, with P. Bose and J. Buss, *Algorithms and Data Structures, WADS ’93 Proceedings*, ed. F. Dehne, J.-R. Sack, N. Santoro, S. Whitesides, *Lecture Notes in Computer Science 709*, Springer-Verlag, 1993, 200–209. (final version listed above)
- Distance visibility graphs, with C. Coullard, *Proc. 7th Annual Symp. on Computational Geometry*, 1991, 289–296. (final version listed above)
- Upward planar drawing of single source acyclic graphs, with M. Hutton, *Proc. 2nd Annual ACM-SIAM Symp. on Discrete Algorithms*, 1991, 203–211. (final version listed above)
- Doubly lexical orderings of matrices, *Proc. 17th ACM Symp. on Theory of Computing*, 1985, 396–404. (final version listed above)
- Decomposing polygonal regions into convex quadrilaterals, *Proc. ACM Symp. on Computational Geometry*, 1985, 97–106.

(d) Contributions to Books

- Upward planar drawing of single source acyclic graphs, M. Hutton and A. Lubiw, *DIMACS Series in Discrete Mathematics and Computer Science, Volume 9: Planar Graphs*, ed. W.T. Trotter, American Math Society, 1993, 41–57.

(e) Other

- Refold Rigidity of Convex Polyhedra, Erik Demaine, Martin Demaine, Jin-Ichi Itoh, Anna Lubiw, Chie Nara and Joseph O’Rourke, *European Workshop on Computational Geometry*, 2012.
- A generalization of the source unfolding of convex polyhedra, Erik D. Demaine, Anna Lubiw, *XIV Spanish Meeting on Computational Geometry*, 2011.
- Large angle crossing drawings of planar graphs in subquadratic area, Patrizio Angelini, Giuseppe Di Battista, Walter Didimo, Fabrizio Frati, Seok-Hee Hong, Michael Kaufmann, Giuseppe Liotta, Anna Lubiw, *XIV Spanish Meeting on Computational Geometry*, 2011.
- Convexifying Polygons Without Losing Visibilities, Oswin Aichholzer, Greg Aloupis, Erik D. Demaine, Martin L. Demaine, Vida Dujmovic, Ferran Hurtado, Anna Lubiw, Günter Rote, André Schulz, Diane L. Souvaine, Andrew Winslow, *Proceedings of the 23rd Annual Canadian Conference on Computational Geometry (CCCG)*, 2011.
- Zipper Unfoldings of Polyhedral Complexes, Erik D. Demaine, Martin Demaine, Anna Lubiw, Arlo Shallit and Jonah Shallit, *22nd Canadian Conference on Computational Geometry (CCCG) 2010*, 219–222.
- Bounded-Degree Polyhedronization of Point Sets, Gill Barequet, Nadia Benbernou, David Charlton, Erik Demaine, Martin Demaine, Mashhood Ishaque, Anna Lubiw, Andre Schulz, Diane Souvaine, Godfried Toussaint and Andrew Winslow, *22nd Canadian Conference on Computational Geometry (CCCG) 2010*, 99–102.
- Shortest Anisotropic Paths with Few Bends is NP-complete, with Mustaq Ahmed, *18th Fall Workshop on Computational Geometry, Rensselaer Polytechnic Institute*, 2008 (2 pages), (work of M. Ahmed’s PhD thesis)

- The Steiner Ratio for Obstacle-Avoiding Steiner Trees, with Mina Razaghpour, 20th Canadian Conference on Computational Geometry (CCCG) 2008, 155–158. (work of M. Razaghpour’s Master’s thesis)
- Properties of shortest descending paths, with M. Ahmed, 17th Annual Fall Workshop on Computational and Combinatorial Geometry, IBM T.J. Watson Research Center, NY, 2007 (2 pages), (work of M. Ahmed’s PhD thesis)
- Optimal schedules for 2-guard room search, with S. Bahun, 19th Canadian Conference on Computational Geometry (CCCG) 2007, 245–248. (work of S. Bahun’s Master’s thesis)
- A lower bound on the area of a 3-coloured disc packing, with P. Brass, F. Hurtado, B. Lafreniere, 19th Canadian Conference on Computational Geometry (CCCG) 2007, 101–104. (work of B. Lafreniere’s Master’s thesis; final version listed above)
- An approximation algorithm for shortest descending paths, with M. Ahmed, CoRR abs/0705.1364, 2007 (14 pages). (work of M. Ahmed’s PhD thesis; final version listed above)
- Shortest descending paths through given faces, with Mustaq Ahmed, 18th Canadian Conference on Computational Geometry (CCCG), 2006, 35–38. (work of M. Ahmed’s PhD thesis; final version listed above)
- Local overlaps in unfoldings of polyhedra, with Brendan Lucier, 15th Annual Fall Workshop on Computational Geometry and Visualization, University of Pennsylvania, October, 2005. (work of B. Lucier’s Master’s thesis)
- Morphing polyhedra preserving face normals: a counterexample, with T. Biedl, M. Spriggs, 17th Canadian Conference on Computational Geometry, 2005, 109–112. (work of M. Spriggs’s PhD thesis; final version listed above)
- Parallel morphing of trees and cycles, with T. Biedl and M. Spriggs, 15th Canadian Conference on Computational Geometry, 2003, 29–34. (work of M. Spriggs’s PhD thesis)
- Equiprojective polyhedra, with M. Hasan, Canadian Conference on Computational Geometry, 2003, 47–50. (work of M. Hasan’s PhD thesis, final version listed above)
- Examples, counterexamples, and enumeration results for foldings and unfoldings between polygons and polytopes, with E. Demaine, M. Demaine, and J. O’Rourke, Technical report 069, Smith College, July 2000.
- When can a net fold to a polyhedron? with T. Biedl and J. Sun, Eleventh Canadian Conference on Computational Geometry, 1999, 1–4. (final version listed above)
- Polyhedral Sculptures with Hyperbolic Paraboloids, with Erik Demaine and Martin Demaine, BRIDGES: Mathematical Connections in Art, Music, and Science; Conference Proceedings, ed. R. Sarhangi, 1999, 91–100.
- Metamorphosis of the cube, with E. Demaine, M. Demaine, J. O’Rourke, I. Pashchenko, in 8th Annual Video Review of Computational Geometry, Proceedings of the 15th Annual ACM Symposium on Computational Geometry, June 1999, pp. 409-410.
- Unfolding some classes of orthogonal polyhedra, with T. Biedl, E. Demaine, M. Demaine, M. Overmars, J. O’Rourke, S. Robbins, S. Whitesides, Tenth Canadian Conference on Computational Geometry, McGill University, 1998, 70–71.
- On reconfiguring tree linkages: trees can lock, with T. Biedl, E. Demaine, M. Demaine, S. Lazard, J. O’Rourke, S. Robbins, I. Steinu, G. Toussaint, S. Whitesides, Tenth Canadian Conference on Computational Geometry, McGill University, 1998, 4–5. (final version listed above)

- Hiding disks in folded polygons, with T. Biedl, E. Demaine, M. Demaine, G. Toussaint, Tenth Canadian Conference on Computational Geometry, McGill University, 1998, 36–37.
- Computing Extreme Origami Bases, E. Demaine and M. Demaine (Note: I am not a co-author, but supervised the work), technical report, Dept. Computer Science, Univ. of Waterloo, 1997.
- NP-hardness of some map labeling problems, with C. Iturriaga, technical report, Dept. Computer Science, Univ. of Waterloo, 1997. (work of C. Iturriaga’s PhD thesis)
- When can a polygon fold to a polytope?, with J. O’Rourke, Technical Report 048, Dept. Comput. Sci., Smith College, June 1996.
- On a visibility representation for graphs in three dimensions, with P. Bose, H. Everett, S. Fekete, H. Meijer, K. Romanik, T. Shermer, and S. Whitesides, Graph Drawing ’93: ALCOM International Workshop on Graph Drawing and Topological Graph Algorithms, France, 1993; also in *Snapshots in Computational Geometry, v. 3*, McGill University School of Computer Science Technical Report SOCS-94.50, 1994. (final version listed above)
- Interval graphs as visibility graphs of simple polygons, Part I: parachutes, with N. Mouawad, Sixth Canadian Conference on Computational Geometry, University of Saskatchewan, 1994, 18–23. (work of N. Mouawad’s Ph.D. thesis)
- Cone visibility graphs, Graph Drawing ’93: ALCOM International Workshop on Graph Drawing and Topological Graph Algorithms, France, 1993.
- The floodlight problem, with P. Bose, L. Guibas, M. Overmars, D. Souvaine, J. Urrutia, Proc. Fifth Canadian Conference on Computational Geometry, University of Waterloo, 1993, 399–404. (final version listed above)
- Maximal outerplanar graphs are relative neighbourhood graphs, with N. Sleumer, Proc. Fifth Canadian Conference on Computational Geometry, University of Waterloo, 1993, 198–203. (work of N. Sleumer’s Master’s thesis)
- Recovery of convex hulls from external visibility graphs, with H. Everett and J. O’Rourke, Proc. Fifth Canadian Conference on Computational Geometry, University of Waterloo, 1993, 309–314.
- Efficient visibility queries in simple polygons, with P. Bose and J.I. Munro, Proc. 4th Canadian Conference on Computational Geometry, 1992, 23–28. (work of P. Bose’s Master’s thesis; final version listed above)
- Orderings and Some Combinatorial Optimization Problems with Geometric Applications, Ph.D. thesis, Department of Computer Science, University of Toronto, 1986, available as a technical report.
- Bipartition systems and how to partition polygons, with Jack Edmonds, Report No. 85406-OR, Inst. for Econ. and Operations Research, Bonn, 1985.
- Γ -Free Matrices, M.Math. Thesis, Department of Combinatorics and Optimization, University of Waterloo, 1982.

Recent Invited Talks

- October 2011, “Reconfiguration of Graph Drawings, Fields Institute Workshop of Rigidity, Toronto, invited.
- June 2011, “Simultaneous Graph Representations, Canadian Discrete and Algorithmic Mathematics Conference (CanaDAM), invited to a mini-symposium.
- April, 2010, “Simultaneous Graph Problems,” MIT Theory of Computation colloquium.
- November 2009, “Finding Shortest Paths,” invited to CRA-W/CDC Workshop on Computational Geometry.

- May 2009, “Morphing Geometric Graphs,” invited talk, Fields Institute Workshop on Discrete and Computational Geometry.
- August 2007, “Morphing Planar Graph Drawings,” Canadian Conference on Computational Geometry, invited speaker.

Grants/Awards

- April 2010—April 2014, NSERC (Natural Sciences and Engineering Research Council of Canada) Discovery Grant, \$43,000/year.
- April 2005—April 2009, NSERC (Natural Sciences and Engineering Research Council of Canada) Discovery Grant, \$37,000/year.
- April 2000—April 2005, NSERC (Natural Sciences and Engineering Research Council of Canada) Operating Grant, \$37,000/year.
- April 1996—April 2000, NSERC (Natural Sciences and Engineering Research Council of Canada) Operating Grant, \$34,500–\$39,848/year.
- April 1993—April 1996, NSERC Operating Grant, \$28,000/year.
- April 1990—April 1993, NSERC Operating Grant, \$25,428/year.
- April 1988—April 1990, NSERC Operating Grant, \$16,000/year.
- August 1987—March 1988, University of Waterloo interim grant, \$5000.
- Sept. 1986—July 1987, NSERC Postdoctoral Fellowship.
- Sept. 1980—Aug. 1982 and Sept. 1983—Dec. 1985, NSERC postgraduate scholarships.

Teaching

- Graph Theoretic Algorithms, graduate, 2011.
- Geometric Graphs, graduate, 2009.
- Algorithms for Polyhedra, graduate, 2002, 2004.
- Computational Geometry, graduate, 1990, 1995, 2006, 2008.
- Algorithms, advanced graduate, 1988 and 1992
- Design and Analysis of Algorithms, 4th year undergraduate/beginning graduate, 1987, 1988, 1991, 1992, 1995, 1997, 2000, 2006, 2007.
- Algorithms, 3rd year undergraduate, 1999, 2005, 2008, 2012.
- Introductory Theory of Computation, 3rd year undergraduate, 1987, 1988, 1995, 1996, 1998, 2001, 2004.
- Models of Computation, 3rd year undergraduate, 2003, 2007, 2011.
- Data Structures and Algorithms, 3rd year undergraduate, 1991
- Linear Programming, 3rd year undergraduate, 1981
- Data Structures and Data Management, 2nd year undergraduate, 1998, 1999, 2000, 2005.
- Programming Languages and Computer Architecture, 2nd year undergraduate, 1989, 1990, and 1992

Graduate Students

PhD:

- Vinayak Pathak, current.
- Hamide Vosoughpour, current.
- Krishnam Raju Jampani, 2011, thesis: “Simultaneous Graph Representation Problems.” K.R. Jampani currently works at Google.
- Mustaq Ahmed, 2009, thesis: “Constrained Shortest Paths in Terrains and Graphs.” M. Ahmed currently works at Google.

- Michael Spriggs, 2007, co-supervised with Therese Biedl, thesis: “Morphing Parallel Graph Drawings”.
- Erik Demaine, 2001, co-supervised with J.I. Munro, thesis: “Folding and Unfolding”, winner of Governor General’s Gold Medal and a 2003 NSERC Doctoral Prize. E. Demaine is currently a faculty member at MIT.
- Claudia Iturriaga, 1999, thesis: “Map Labeling Problems”. C. Iturriaga works at Agfa.
- Naji Mouawad, 1996, thesis: “Interval Graphs as Visibility Graphs of Simple Polygons”.
- Hari Titan, 1993, co-supervised with A. Vannelli, thesis: “MaxCuts in Circuit Layout, Bitmaps and Ising Models: Algorithms and Computational Experience”.
- on Ph.D. committee for: I. Pivotto (2011, C&O), Y. Chen (2009, CS), P. Afshani (2008, CS), M. Pei (2008, C&O), B. Genc (2008, CS), M. Hasan (2005, CS), I. Bell (1996, CS), E. Cheng (1995, C&O), A. Brodnik (1995, CS), A. Viola (1995, CS), H. Strayer (1994, CS), R. Shi (1993, CS), S. Fekete (1992, C&O), I. Gitler (1991, C&O), B. Shepherd (1990, C&O), A. Metzlar (1990, C&O), R. Willard (1989, Pure Math.), B. Gamble (1989, C&O), W. Myrvold (1988, CS), H. AboElFotouh (1988, C&O), L. Goddyn (1988, C&O).

Master’s:

- Taylor Gordon, 2010, co-supervised with J.I. Munro, thesis: “Simultaneously Embedding Planar Graphs at Fixed Vertex Locations”.
- Mina Razaghpour, 2008, thesis: “The Steiner Ratio for the Obstacle-Avoiding Steiner Tree Problem”. M. Razaghpour currently works for Google.
- Steve Bahun, 2008, thesis: “Algorithms for Optimizing Search Schedules in a Polygon”.
- Benjamin Lafreniere, 2008, thesis: “Packing Unit Disks”. B. Lafreniere is in the PhD program at UW.
- Brendan Lucier, 2006, co-supervised with J.I. Munro, thesis: “Unfolding and Reconstructing Polyhedra”. B. Lucier is currently in the PhD program at UofT.
- Luke Tanur, 2005, thesis: “A Geometric Approach to Pattern Matching in Polyphonic Music”.
- Julie Sun, 1999, thesis: “Folding Orthogonal Polyhedra”.
- Nora Sleumer, 1993, thesis: “Outerplanar Graphs as Proximity Graphs”. N. Sleumer completed her PhD at ETH, Zurich.
- Prosenjit Bose, 1991, co-supervised by J.I. Munro, thesis: “Visibility in Simple Polygons”. Joint publication in Canadian Conference on Computational Geometry, as listed above. P. Bose is currently a faculty member at Carleton University.
- Paul Colley, 1991, thesis: “Visibility Graphs of Uni-monotone Polygons”. Publication in Fourth Canadian Conference on Computational Geometry, “Recognizing visibility graphs of uni-monotone polygons”. P. Colley completed his PhD at Queen’s University.
- Michael Hutton, 1990, thesis: “Upward Planar Drawing of Single Source Acyclic Digraphs”. Joint publication in ACM-SIAM Symposium on Discrete Algorithms, and SIAM J. Computing, as listed above. M. Hutton completed his PhD at U. of Toronto.
- Krishna Gopinathan, 1988, essay: “Decomposing a Graph Uniquely into Triconnected Components”

External Examiner:

- P. Angelini, “On The Existence And Optimality Of Some Planar Graph Embeddings,” Roma Tre University, Italy, 2010.

Service

- Women in CS Committee (chair), August 2011—present.
- School of Computer Science Promotion and Tenure Committee, July 2010—2011.
- School of Computer Science Graduate Committee, July 2010—2011.
- School of Computer Science Annual Evaluation Committee, 2009.
- School of Computer Science Commons Committee, September 2005—2009.
- Women in CS Committee, August 2008—2009.
- Women in CS Committee (chair), August 2007—August 2008.
- School of Computer Science Promotion and Tenure Committee, June 2007—April 2008.
- School of Computer Science Advisory Committee on Appointments, October 2006—May 2007.
- Math Faculty Promotion and Tenure Committee, September 2004—January 2007.
- Subcommittee on Graduate Course Evaluations, September 2004—June 2005.
- Graduate Committee, January 2002—August 2004.
- Web Committee, September 2002—present.
- Promotion and Tenure Committee, July 2002—May 2003.
- Interdisciplinary Grants Committee, Sept. 2000—July 2001.
- National Scholarship Competition Committee, spring 2001.
- Graduate Committee, Sept. 1999—July 2001.
- Promotion and Tenure Committee, July 1996—December 1998
- Curriculum Committee Sept. 1988—August 1991
- PhD Comprehensive Exam Committee, Sept. 1991—July 1993, Fall 1996.
- Nominating Committee for Chair of Computer Science, Sept. 1991—Dec. 1991
- First Year Course Evaluation Committee, July 1992—July 1993
- Graduate Committee, Sept. 1992—July 1993

Refereeing

This needs to be updated.

International Journal of Computational Geometry and Applications (4), Computational Geometry: Theory and Applications (11), Discrete and Computational Geometry (3), SIAM J. on Computing (4), Algorithmica (1), Information and Computation (2), J. Algorithms (3), Information Processing Letters (3), BIT (2), Computational Complexity (1), J. Parallel and Distributed Computing (1), ACM Transactions on Graphics (1), International Conference on Computing and Information (1), SIAM J. on Discrete Math. (4), Combinatorica (3), Discrete Math. (3), Discrete Applied Math. (5), J. Combinatorial Theory B (5), J. Graph Theory (1), Math. of Operations Research (1), ORSA Journal on Computing (1), Networks (1), Mathematical Programming (1), a chapter of the Handbook on Computational Geometry, a paper for a Cambridge University Press volume based on a Discrete and Computational Geometry program at the Mathematical Sciences Research Institute in Berkeley, NSF proposals (3), NSERC proposals (19), NSA proposal (1), tenure and promotion letters (2).

Committees, Editing

- NSERC Discovery Grant Evaluation Committee, 2012–2014.
- on program committee, Graph Drawing 2012.
- on program committee, Symposium on Discrete Algorithms (SODA), 2012.
- on program committee, 23rd Canadian Conference on Computational Geometry (CCCG), 2011.
- on program committee, International Workshop on Combinatorial Algorithms (IWOC), 2011.

- on program committee, Symposium on Computational Geometry (SoCG), 2011.
- on program committee, 22st Canadian Conference on Computational Geometry, 2010.
- on program committee, Fall Workshop on Computational Geometry 2009.
- on program committee, 21st Canadian Conference on Computational Geometry, 2009.
- on program committee, International Symposium on Algorithms and Computation (ISAAC) 2008.
- on program committee, Symposium on Computational Geometry (SoCG), 2004
- on program committee, 16th Canadian Conference on Computational Geometry, 2004.
- on program committee for Graph Drawing 2002.
- on program committee and organizing committee, 13th Canadian Conference on Computational Geometry, 2001.
- on program committee, 12th Canadian Conference on Computational Geometry, 2000.
- organizer of mini-symposium for SIAM Conference on Discrete Math, 2000.
- on program committee for Video Review, Symposium on Computational Geometry, 2000.
- on program committee for the Symposium on Computational Geometry, 1999.
- on program committee for Graph Drawing 1998.
- guest editor, with J. Urrutia, of Computational Geometry: Theory and Applications, Volume 7, Numbers 1–2, January 1997.
- on program committee for Graph Drawing 1995.
- co-chair of program committee, and local organizer for Fifth Canadian Conference on Computational Geometry, August, 1993, University of Waterloo.
- on program committee for Fourth Canadian Conference on Computational Geometry, August 1992.

Professional Memberships

ACM