

# Steven Chaplick

## Curriculum Vitae

May 2012

Address: 86 Dancers Dr., Markham, Ont., Canada. L6C 2A5.

Phone: +1 416 845 6973

Email: chaplick@cs.toronto.edu

WWW: [www.cs.toronto.edu/~chaplick](http://www.cs.toronto.edu/~chaplick)

### Research: Graph Theory and Graph Algorithms

My current research focuses on intersection representations of graphs, efficient methods for graph class recognition, and concise canonical representations of graphs. I am also interested in graph class hierarchies, forbidden subgraph characterizations of graph classes, graph decompositions, graph searching, and graph homomorphism. My secondary interests are in Computational Biology and Complexity Theory; specifically, genome assembly and comparison, fixed parameter tractability, and kernelization.

### Postdoctoral Research Fellowships

May 2012 – Present

**Faculty of Applied Science, Simon Fraser University**

School of Computing Science (Advisor: Pavol Hell)

Jan. 2012 – Apr. 2012

**Faculty of Science, Wilfrid Laurier University**

Department of Physics and Computer Science (Advisors: Kathie Cameron & Chinh Hoàng)

### Education

Feb. 2008 – Jan. 2012

**Faculty of Arts & Science, University of Toronto**

Ph.D. in Computer Science (Advisor: Derek Corneil).

Sept. 2006 – Jan. 2008

**Faculty of Arts & Science, University of Toronto**

M.Sc. in Computer Science (Advisor: Derek Corneil)

Sept. 2001 – Apr. 2006

**Faculty of Mathematics, University of Waterloo**

Honours B. Math, Double Degree in Combinatorics & Optimization and Computer Science Co-op

### Honours and Awards:

- Alfred B. Lehman Graduate Scholarship in Computer Science: \$5,000 (Awarded: Nov. 2010).
- Ontario Graduate Scholarship in Science and Technology: \$15,000 (Awarded: Sept 2008).

### Journal Publications

1. S. Chaplick and J. Stacho. The vertex leafage of chordal graphs. *Discrete Applied Mathematics* (2012). To appear. arXiv:1104.2524 [cs.DM].

### Refereed Papers in Conference Proceedings

1. S. Chaplick, V. Jelínek, J. Kratochvíl, and T. Vyskočil. “Bend-Bounded Path Intersection Graphs: Sausages, Noodles, and Waffles on a Grill”. Accepted to the 38th International Workshop on Graph-Theoretic Concepts in Computer Science. To appear in LNCS. 2012.
2. S. Chaplick, E. Cohen, and J. Stacho. “Recognizing Some Subclasses of Vertex Intersection Graphs of 0-Bend Paths in a Grid”. In: *Graph-Theoretic Concepts in Computer Science*. Vol. 6986. Lecture Notes in Computer Science. 2011, pp.319–330.
3. S. Chaplick, M. Gutierrez, B. Lévêque, and S. Tondato. “From Path Graphs to Directed Path Graphs”. In: *Graph-Theoretic Concepts in Computer Science*. Vol. 6410. Lecture Notes in Computer Science. 2010, pp.256–265.

### Theses

1. S. Chaplick. “Path Graphs and PR-trees”. PhD thesis. University of Toronto, 2012.
2. S. Chaplick. “PQR-trees and Undirected Path Graphs”. M.Sc. Thesis, University of Toronto. 2008.

### Submitted Papers

1. K. Cameron, S. Chaplick, and C. Hoàng. “Edge Intersection Graphs of L-Shaped Grid Paths”. Submitted Apr. 2012 for conference publication (MFCS 2012).

2. S. Chaplick. "Characterizing and Recognizing Path Graphs and Directed Path Graphs using PR-trees". Submitted Apr. 2010 to the Journal of Discrete Applied Mathematics.

### Papers in Production

1. S. Chaplick and T. Ueckerdt. "Planar Graphs as Contact and Intersection Graphs of Grid Paths".
2. I. Adler, S. Chaplick, J. Fiala, P. van 't Hof, D. Paulusma, and M. Tasar. "Locally Constrained Homomorphism with Bounded Parameters".

### Current Projects

1. S. Chaplick, P. Hell, and R. Uehara. "Characterization and Recognition of Orthogonal Ray Graphs".
2. D. Catanzaro, S. Chaplick, B. V. Halldórsson, M. M. Halldórsson, and J. Stacho. "Pointed-Tolerance Graphs and Genome-Wide Association Studies".
3. S. Chaplick, M. Francis, and P. Hell. "Characterization and Recognition of Interval Nest Digraphs".
4. S. Chaplick, M. Habib, and B. Lèvêque. "Vertex Ordering Properties of Leaf Powers".
5. S. Chaplick and B. Lèvêque. "The Forbidden Asteroidal Triple Structure of Path Graphs".
6. S. Chaplick and M. Habib. "The Maximal Clique–Minimal Separator Structure of Chordal Families of Graphs".
7. S. Chaplick, M. Fellows, and B. König. "Graph Rewriting Confluence in Kernelization Methods".

### Conference Presentations

1. K. Cameron, S. Chaplick, and C. Hoàng. *Edge Intersection Graphs of L-Shaped Grid Paths*. Prairie Discrete Math Workshop 2012 – Calgary, AB, Canada. Related to submitted paper [1]. May 2012.
2. I. Adler, S. Chaplick, J. Fiala, P. van 't Hof, D. Paulusma, and M. Tasar. *Locally Constrained Homomorphism with Bounded Parameters*. 4<sup>th</sup> Workshop on Algebraic, Topological and Complexity Aspects of Graph Covers (ATCAGC 2012) – University of Oregon, Eugene, Oregon, U.S.A. Related to paper in production [2]. Jan. 2012.
3. S. Chaplick and T. Ueckerdt. *Planar Graphs as Contact and Intersection Graphs of Grid Paths*. HOMONOLO'11 – Nova Louka, Czech Republic. Related to paper in production [1]. Dec. 2011.
4. S. Chaplick and J. Stacho. *The Vertex Leafage of Chordal Graphs*. 3rd biennial Canadian Discrete and Algorithmic Mathematics Conference (CanaDAM) – Victoria, BC, Canada. Related to journal paper [1]. June 2011.
5. S. Chaplick. *Characterizing Path Graphs and Directed Path Graphs using PR-trees*. 2nd Workshop on Graph Decomposition: Theoretical, Algorithmic and Logical Aspects – Marseille, France. Related to submitted paper [2]. Oct. 2010.
6. S. Chaplick, M. Gutierrez, B. Lèvêque, and S. Tondato. *From path graphs to directed path graphs*. 36th International Workshop on Graph Theoretic Concepts in Computer Science – Zaros, Greece. Related to conference paper [3]. June 2010.
7. S. Chaplick. *Characterizing the intersection graphs of paths in trees using PR-trees*. Midwest Conference on Combinatorics, Cryptography, and Computing (MCCCC) – Rochester, NY, USA. Preliminary results from submitted paper [2]. Oct. 2009.

### Seminars

1. S. Chaplick, V. Jelinek, J. Kratochvil, and T. Vyskočil. *Bend-Bounded Path Intersection Graphs: Sausages, Noodles, and Waffles on a Grill*. Discrete Math Seminars at Simon Fraser University (Burnaby, BC, Canada). Related to conference paper [1]. May 2012.
2. S. Chaplick. *Path Graphs, PR-trees, and Split Decomposition*. Tutte Seminar – Department of Combinatorics & Optimization, University of Waterloo (Waterloo, Ont., Canada). Related to my Ph.D. Thesis. Apr. 2012.
3. S. Chaplick. *Path Graphs and PR-trees*. Graphs@Ryerson Seminar Series – Mathematics Department, Ryerson University (Toronto, Ont., Canada). Related to my Ph.D. Thesis. Feb. 2012.
4. S. Chaplick. *Characterizing Path Graphs and Directed Path Graphs using PR-trees*. Department of Applied Math Noon Lectures at Charles University (Prague, Czech Republic). Related to submitted paper [2]. June 2011.
5. S. Chaplick. *Characterizing Path Graphs and Directed Path Graphs using PR-trees*. Discrete Math Seminars at Simon Fraser University (Burnaby, BC, Canada). Related to submitted paper [2]. May 2011.

6. S. Chaplick, M. Gutierrez, B. Lèvêque, and S. Tondato. *From path graphs to directed path graphs*. Haifa Tuesday Seminar meetings at The Caesarea Rothschild Institute at the University of Haifa (Haifa, Israel). Related to conference paper [3]. Jan. 2011.
7. S. Chaplick. *Characterizing Path graphs using PR-trees*. Haifa Tuesday Seminar meetings at The Caesarea Rothschild Institute at the University of Haifa (Haifa, Israel). Related to submitted paper [2]. Jan. 2011.
8. S. Chaplick, M. Gutierrez, B. Lèvêque, and S. Tondato. *From path graphs to directed path graphs*. Laboratoire d'Informatique Algorithmique: Fondements et Applications (LIAFA), Université Paris Diderot - Paris 7 (Paris, France). Related to conference paper [3]. Oct. 2010.
9. S. Chaplick. *Characterizing Path graphs using PR-trees*. Algorithmique et combinatoire seminar series at LIAFA, Université Paris Diderot - Paris 7 (Paris, France). Related to submitted paper [2]. July 2010.
10. S. Chaplick. *Characterizing the Intersection Models of Path graphs using PR-trees*. AlGCo seminar series at Laboratoire d'Informatique, de Robotique et de Microelectronique de Montpellier (LIRMM), Université Montpellier 2 (Montpellier, France). Related to submitted paper [2]. June 2010.

### Teaching Experience(University of Toronto<sup>1</sup>)

#### Instructorships:

- May – Aug 2010 **CSC373: Algorithm Design & Analysis**  
 May – Aug 2009 **CSC165: Mathematical Expression & Reasoning**  
 May – Aug 2008 **CSC165: Mathematical Expression & Reasoning**  
 May – Aug 2007 **CSC236: Introduction to the Theory of Computation**

Note: Class sizes varied from 20 to 60 students, and I was the sole instructor of these courses.

#### Teaching Assistantships:

- May – Aug 2011 **CSC373: Algorithm Design & Analysis**  
 Jan – Apr 2011 **CSC373: Algorithm Design & Analysis**  
**CSC240: Enriched Introduction to the Theory of Computation**  
 Sept – Dec 2010 **CSC373: Algorithm Design and Analysis**  
 Jan – Apr 2010 **CSC190: Computer Algorithms, Data Structures and Languages**  
**Computer Science Undergraduate Help Centre (Head TA)**  
 Sept – Dec 2009 **CSC373: Algorithm Design and Analysis**  
 Jan – Apr 2009 **Computer Science Undergraduate Help Centre: Head TA**  
 Sept – Dec 2008 **SCI199: From Social Networks to the Internet**  
**Computer Science Undergraduate Help Centre (Head TA)**  
 Jan – Apr 2008 **CSC165: Mathematical Expression & Reasoning**  
**Computer Science Undergraduate Help Centre (TA)**  
 Sept – Dec 2007 **CSC165: Mathematical Expression & Reasoning**  
 Sept – Dec 2006 **CSC373: Algorithm Design & Analysis**  
**CSC363: Introduction to Computing & Complexity**

### Certification

- Sept. 2006 – Apr. 2007 **School of Graduate Studies, University of Toronto**  
**Teaching Assistant Training Program: Certificate – Teaching Fundamentals**

### Administrative Experience (University of Toronto)

- May 2007 – Apr 2009 **Computer Science Graduate Student Society: President**

- Elected in April 2007, and re-elected in April 2008 to represent the 300 graduate students in computer science. A third term was not sought.

<sup>1</sup>Course Calendar: <http://www.artsandscience.utoronto.ca/ofr/archived/1011calendar/index.html>

- Interacted with Faculty and Administration to improve the Graduate Program.
- Ensured computer science graduate students interests are represented within the university by establishing and increasing student presence on departmental committees.
- Organized social events and helped to build the community within the department.

### Professional Membership

- Society for Industrial and Applied Mathematics (SIAM).

### Referee Experience

- DAM – Journal of Discrete Applied Mathematics.
- STOC – ACM Symposium on Theory of Computing.
- TCS – Journal of Theoretical Computer Science.
- WG – International Workshop on Graph-Theoretic Concepts in Computer Science.

### Other Work Experience

Sept – Dec 2005 **Amazon.com: Software Development Engineer (Supply Chain Optimization)**  
Jan – Apr 2005 **Amazon.com: Software Development Engineer (Customer Database Systems)**  
May – Aug 2004 **Sun Microsystems Inc.: Java Developer (CRM software)**  
Sept – Dec 2003 **Chordiant Software Inc.: Software Developer / Consultant (CRM software)**  
Jan – Apr 2003 **Canada Life Casualty Insurance Company: Database Programmer/Analyst**  
Apr – Aug 2002 **CGI: Database Programmer/Analyst**

### Research References (alphabetical)

- Professor Kathie Cameron (kcameron@wlu.ca)  
Department of Mathematics, Wilfrid Laurier University (Waterloo, Ont., Canada).
- (PhD Advisor) Professor Derek Corneil (dgc@cs.toronto.edu)  
Department of Computer Science, University of Toronto (Toronto, Ont., Canada).
- Professor Martin Charles Golumbic (golumbic@cs.haifa.ac.il)  
Caesarea Rothschild Institute, University of Haifa (Haifa, Israel).
- Professor Michel Habib (habib@liafa.jussieu.fr)  
LIAFA, Université Paris Diderot – Paris 7 (Paris, France).
- Professor Pavol Hell (pavol@cs.sfu.ca)  
School of Computing Science, Simon Fraser University (Vancouver, BC., Canada).
- Professor Chinh Hoàng (choang@wlu.ca)  
Department of Mathematics, Wilfrid Laurier University (Waterloo, Ont., Canada).
- Professor Jan Kratochvíl (honza@kam.mff.cuni.cz)  
Department of Applied Mathematics, Charles University (Prague, Czech Republic).

### Teaching Reference

- Senior Lecturer and Associate Chair (Undergraduate Program), Karen Reid (reid@cs.toronto.edu)  
Department of Computer Science, University of Toronto (Toronto, Ont., Canada).