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RESEARCH INTERESTS Randomized algorithms, data structures, distributed computing, lower bounds, applications to computational biology and networks.

EDUCATION

- Ph.D., 1988, Computer Science, University of California, Berkeley. Thesis: "Lower Bounds on the Complexity of Graph Properties," supervised by Richard Karp.

- J.D., 1983, Boalt Hall School of Law, University of California, Berkeley.

- A.B., 1977, Mathematics, Princeton University, Princeton, NJ.

PROFESSIONAL EXPERIENCE

- *2003-present*: Professor, Department of Computer Science, University of Victoria

- *2006-7*: Visiting Researcher, Microsoft Research Silicon Valley Center, Mountain View, CA.

- *2001-02*: Senior member of the technical staff, Systems Research Center, HP Labs, formerly, Compaq, Palo Alto, CA.

- *6/97-03* : Associate Professor, Department of Computer Science, University of Victoria.

- *1/99-6/99* : Visiting Scholar, Computer Science Department, U.C. Berkeley and ICSI.

- *1/99-6/99* : Visiting Professor, Computer Science Department, Hebrew University

- *7/98-9/98* : Visiting Associate Professor, DIKU, University of Copenhagen

- *7/92-97* : Assistant Professor, Department of Computer Science, University of Victoria.

- *9/90-6/92*: Research Scientist, NECI, Princeton, NJ.

- *1/89-8/90*: Postdoctoral Fellow, University of Toronto, Department of Computer Science.

- *2/90* : Visiting Scientist, University of Bonn, W. Germany.

- *9/88-12/88* : Postdoctoral Fellow, Princeton University, Department of Computer Science.

PROFESSIONAL MEMBERSHIPS

- California State Bar

- ACM

MAJOR RESEARCH GRANTS

- Natural Sciences and Engineering Research Council (NSERC) of Canada Research Grant.
  Amount per year: $48,000. Years of tenure: 2006-2010.
  Title: "Algortihms and Data Structures for Networks"

- Natural Sciences and Engineering Research Council (NSERC) of Canada Research Grant.
  Amount per year: $49,000. Years of tenure: 2001-2005.
  Title: "Dynamic Data Structures."

- Nortel Networks
  Principal investigators: Eric Manning and Ali Shoja.
  Amount: $58,000. Year received: 1999-2000
  "A Predictor and an Optimizer for the Network Organizer."

- Natural Sciences and Engineering Research Council (NSERC) of Canada Research Grant.
  Amount per year (currently): $43,800. Years of tenure: 1997-2001.
  Title: "Randomization and Dynamic Data Structures."

- Natural Sciences and Engineering Research Council (NSERC) of Canada Research Grant.
  Amount per year: $22,000. Years of tenure: 1992-1997.
  Title: "Randomized and Deterministic Data Structures."

- Natural Sciences and Engineering Research Council (NSERC) of Canada Equipment Grant.
  Principal investigator: Mike Fellows.
  Amount: $20,742. Year received: 1997.
  Title: "Implementation of Bounded Width Algorithmics for Applications in Biology."

PUBLICATIONS

Papers in Refereed Journals

1. Valerie King, Scott Lewis, and Jared Saia, "Simple and Efficient Algorithms for Choosing a Random Peer," *Algorithmica* 49 (2) pp. 147-169 (2007).

2. Valerie King and Garry Sagert, "A Fully Dynamic Algorithm for Maintaining the Transitive Closure", *Journal of Comput. Systems Science* 65(1) (2002) pp. 150-167.

3. Moniker Henzinger and Valerie King, "Maintaining minimum spanning forests in dynamic graphs" *SIAM J. of Computing*, vol. 31, no.2, pp. 364-374 (2001).

4. Monika Henzinger and Valerie King, "Randomized Dynamic Algorithms with Polylogarithmic Time per Operation," *Journal of the ACM*, Vol. 46 No. 4 (1999) pp.502-516.

5. M. Henzinger, V. King and T. Warnow "Constructing a Tree from Homeomorphic Subtrees with Applications to Computational Biology," *Algorithmica*, vol. 24, no.1 (1999) pp.1-13.

6. V. King, C. K. Poon, V. Ramachandran, and S. Sinha"An Optimal EREW algorithm for minimum spanning tree verification", *Information Processing Letters*, 62(3) (1997) pp.153-159.

7. Valerie King, "A Simpler Linear Time Algorithm for Minimum Spanning Tree Verification." *Algorithmica*, 18 (1997) pp.263-270.

8. F. Fich, R. Impagliazzo, B. Kapron, V. King, and M. Kutyłowski"Limits on the power of parallel random access machines with weak forms of write conflict resolution" *Journal of Computer and System Sciences* 53 (1996) pp.104-111.

9. V. King, S. Rao and R. Tarjan, "A Faster Deterministic Maximum Flow Algorithm," *Journal of Algorithms*, vol. 17. no. 3 (1994) pp.447-474.

10. Claire. Kenyon and Valerie King, "On Boolean Decision Trees with Noisy Nodes," *Random Structures and Algorithms*, vol.5 no.3 (1994), pp. 453-464.

11. Wayne Goddard, Claire Kenyon, Valerie King, and Leonard Schulman"Optimal Randomized Algorithms for Local Sorting and Set-Maxima," *SIAM Journal of Computing*, 22(2) (1993), pp. 272-285.

12. Valerie King, "A Lower Bound for the Recognition of Digraph Properties," *Combinatorica*, 10(1) (1990) pp.53-59.

13. Valerie King, 'An $\Omega(n^{5/4})$ Lower Bound on the Randomized Complexity of Graph Properties," in *Combinatorica,* 11(1) (1991), pp.23-32.

Papers in Refereed Conferences

14. Valerie King, Cynthia Phillips, Jared Saia, Maxwell Young, "Sleeping on the Job: Energy Efficient Broadcast for Radio Networks," to appear in *ACM Principles of Distributed Computing (PODC)* (2008).

15. Valerie King, Louis Lei Yu, Yan Zhuang, "Guanxi in the Chinese Web - a Study of Mutual Linking. Best Poster Award. *International World Wide Web Conference (WWW)* (2008) pp. 1161-1162

16. Bruce M. Kapron, David Kempe, Valerie King, Jared Saia, Vishal Sanwalani, "Fast Asynchronous Byzantine Agreement and Leader Election with Full Information. *ACM SIAM Symp. on Discrete Algorithms (SODA)* (2008). pp. 1038-1047.

17. V. King, J.Saia, V. Sanwalani, E. Vee'"Towards Secure and Scalable Computation in Peer-to-Peer Networks," *IEEE Foundations of Computer Science (FOCS)* (2006) pp.87-98..

18. D. Holtby, B. Kapron, V. King, "Lower Bounds for Scalable Byzantine Agreement" with D. Holtby and B. Kapron, *ACM Principles of Distributed Computing (PODC)* (2006) pp.285-291.

19. Valerie King, Jared Saia,Vishal Sanwalani, Erik Vee. "Scalable Leader Election, *ACM SIAM Symp. on Discrete Algorithms (SODA)* (2006) pp.990-999.

20. Chong Liu, Kui Wu, Valerie King, "Very low cost sensor localization for hostile environments," IEEE Int. Conf. on Communications (ICC) (2005).

21. Chong Liu, Kui Wu, Valerie King: Randomized Coverage-Preserving Scheduling Schemes for Wireless Sensor Networks. *NETWORKING* (2005) pp.956-967.

22. Sarah Carruthers, Valerie King. "Connectivity of Wireless Sensor Networks with Constant Density. *ADHOC-NOW* (2004) pp. 149-157.

23. Dennis Dreef, Sanaz Ahari, Kui Wu, Valerie King. "Utilizing the Uncertainty of Intrusion Detection to Strengthen Security for Ad Hoc Networks," *ADHOC-NOW* (2004) pp. 82-95.

24. Valerie King, Jared Saia. Choosing a random peer. *ACM SIGACT-SIGOPS Symp. on Principles of Distributed Computing (PODC)* (2004) pp. 125-130.

25. Valerie King, Li Zhang, and Yunhang Zhou, "On the Complexity of Distance-based Tree Reconstruction Methods," *ACM-IEEE SODA '03.*

26. Valerie King and Mikkel Thorup, "Space-saving Trick for Maintaining Shortest Paths and Transitive Closure," *Proceedings of the 7th Annual International Conference COCOON in LNCS 2108* (August, 2001) pp. 268-277.

27. Valerie King, Orna Kupferman, Moshe Y. Vardi. "On the Complexity of Parity Word Automata" *Foundations of Software Sci. and Computation Structures (FoSSaCS)* (2001) pp. 276-286.

28. Valerie King, "Fully Dynamic Algorithms for Maintaining All-Pairs Shortest Paths and Transitive Closure in Digraphs." *40th Symposium on Foundations of Computer Science (FOCS)* (October, 1999).

29. Valerie King and Garry Sagert, "A Fully Dynamic Algorithm for Maintaining the Transitive Closure", *31st ACM Annual Symposium on Theory of Computing (STOC)* (May 1999).

30. Monika Henzinger and Valerie King, "Maintaining a minimum spanning tree in a dynamic graph" *24th International Colloquium of Automata, Languages and Programming (ICALP)* (July 1997).

31. Monika Henzinger, Valerie King, and Tandy Warnow, "Constructing a Tree from Homeomorphic Subtrees with Applications to Computational Biology," with *7th Annual ACM-SIAM Symposium on Discrete Algorithms (SODA)* (January, 1996).

32. Monika Henzinger and Valerie King, "Fully Dynamic Biconnectivity and Transitive Closure," *36th Symposium on Foundations of Computer Science (FOCS)* (October, 1995), pp. 664-72.

33. Valerie King "A Simpler Linear Time Algorithm for Minimum Spanning Tree Verification." *Fourth Workshop on Algorithms and Data Structures (WADS)* (August 1995).

34. Monika Henzinger and Valerie King "Randomized Dynamic Algorithms with Polylogarithmic Time per Operation " *27th ACM Annual Symposium on Theory of Computing (STOC)* (May 1995).

35. F. Fich, R. Impagliazzo, B. Kapron, V. King, and M. Kutyłowski. "Limits on the power of parallel random access machines with weak forms of write conflict resolution" *10th Symposium on Theoretical Aspects of Computer Science (STACS)* (February 1993).

36. V. King, S. Rao and R. Tarjan,"A Faster Deterministic Maximum Flow Algorithm," *Third Annual ACM-SIAM Symposium on Discrete Algorithms (SODA)* (January 1992) pp.157-64.

37. C. Kenyon and V. King "On Boolean Decision Trees with Noisy Nodes," *Israel Symposium on Theory of Computing and Systems*, (May 1992), pp.24-31.

38. Wayne Goddard, Valerie King, and Leonard Schulman, "Optimal Randomized Algorithms for Local Sorting and Set-Maxima" *22nd ACM Annual Symposium on Theory of Computing (STOC)* (May 1990) pp.45-53.

39. C. Kenyon-Mathieu and V. King, "Verifying Partial Orders," *Proceedings of the 21st ACM Annual Symposium on Theory of Computing (STOC)* (May 1989) pp. 367-74.

40. Valerie King, "Lower Bounds on the Complexity of Graph Properties," *20st ACM Annual Symposium on Theory of Computing (STOC)* (May 1988), pp. 468-74.

Book chapters

41. "Dynamic graph connectivity," in *Encylopedia of Algorithms*, ed. Ming Kao, Springer (2008).

42. "Dynamic Transitive Closure," in *Encylopedia of Algorithms*, ed. Ming Kao, Springer (2008).

STUDENTS and POSTDOCs who have completed their studies

- Peter Yan, M.Sc. 1997. Thesis title: "Coloring Random k-Colorable Graphs."

- Torrey Hoffman, M.Sc. 1998. Thesis title: A Cache Scheduling Problem.

- Garry Sagert, M.Sc. 2000. Thesis Title: Dynamic Transitive Closure Algorithms.

- Lou Ibarra, Ph.D. 2001: Thesis title: Dynamic Chordal and Interval Graph Algorithms.

- Peter Hollemans, M.Sc., 2003. Thesis ttitle: Minimal Energy Broadcasting Networks

- Dan Holtby, MSc. 2006. Thesis title: Lower bounds for Scalable Byzantine Agreement.

- Vishal Sanwalani (post-doc) 2006. Research Topic: Byzantine Agreement.

- Gordon Brown, Ph.D. 2008. Thesis title: An Analysis of Salmonid RNA Sequences and Implications for Salmonid Evolution."

Current students and post-docs:

- Louis Yu, Ph.D. Thesis Topic: Social networks

- Yan Zhuang, MSc. Thesis Topic: Efficient Modeling of the WWW

- Warren Sheckenfelder, MSc. Thesis Topic: Machine Learning.

- Yueh-Hua Lee, Ph.D. Thesis Topic: Sensor Networks.

External examiner for:

- Liam Roditty, Ph.D. candidate, University of Tel Aviv (2006).

- Camil Demestrescu, Ph.D. candidate at University of Rome, "La Sapienza" (2000) ;

- Stephen Alstrup, Ph.D. University of Copenhagen (DIKU) (1999);

OTHER TECHNICAL CONTRIBUTIONS

I served the technical committees for the following conferences:

- 2008 IEEE Foundations of Computing (FOCS)
- 2007 13th Annual International Computing and Combinatorics Conference (COCOON)
- 2007 39h ACM Annual Symposium on Theory of Computing (STOC)
- 2005 Workshop on Algorithms and Data Structures (WADS)
- 2004 Latin American Theoretical Informatics Symp. (LATIN)
- 2002 ACM-SIAM Symposium on Discrete Algorithms (SODA).
- 1999 RANDOM.
- 1999 ACM-SIAM Symposium on Discrete Algorithms (SODA).
- 1998 Scandanavian Workshop on Algorithmic Theory (SWAT).
- 1997 29th ACM Annual Symposium on Theory of Computing (STOC).
- 1993 ACM-SIAM Symposium on Discrete Algorithms (SODA).

Organizer or co-organizer of the following workshops:

- 2009: BIRS Workshop on Lower Bounds in Distributed Computing.
- 2008: Workshop in Honor of Bob Tarjan's 60th Birthday Birthday in Princeton, NJ.
- 2004 ALADDIN workshop on dynamic algoriithms and applications
- 2001 CAIMS (Canadian industrial and applied mathematics) workshop on computational biology
- 2000 PIMS (Pacific institute of mathematical sciences) workshop on dynamic graphs

Other professional activities:

- 2008: Local Arrangements Co-chair of the ACM STOC in Victoria, Canada.
- 2007-: Member of the College of Reviewers for Canada Research Chairs Program.
- 2000, 2007: Reviewer for the Israel Science Foundation
- 2000: Reviewer for the Danish National Council (Science Research Project Grant Assessment
- 2001-4: Member of the NSERC Discovery Grant Panel
- 1998: Member of the NSF Theory Panel

RECENT TALKS

- "A Simple Streaming Problem with Applications to Power Consumption in Sensor Nets," Workshop on Algorithms and Data Structures, Bertinoro (2007).

- "Distributed Computing With Malicious Processors w/o Crypto or Private Channels", at Google, Mountain View and HP Labs, Palo Alto (2007)

- "Zombies, ETs and Other Encounters with Dynamic Graph Algorithms, " invited plenary talk, 1st Canadian Discrete and Applied Mathematics Conference (CanaDAM) 2007.

- "Scalable Distributed Computing," University of Toronto and University of Waterloo (2006).

- "The Complexity of Reconstructing Evolutionary Trees from Distances," University of Toronto (2002).

- "Dynamic Graph Algorithms–An Overview," U.C. Berkeley (1999), IBM Almaden (2000), Compaq SRC (2000).

- "A Fully Dynamic Algorithm for Maintaining the Transitive Closure,", Stanford University (1999).

- "A Simpler Minimum Spanning Tree Verification Algorithm," presented at: University of Texas at Austin (1996); University of British Columbia (1995); University of Washington (1994).

- "Randomized Dynamic Graph Algorithms with Polylogarithmic Time per Operation," presented at University of Texas at Austin (1996); University of Washington (1995), Carnegie-Mellon (1995).

- "Dynamic Data Structures and Consensus Trees," CIAR sponsored Canadian Genome Conference, Quebec (1995).

- Computing the nni Distance between Two Trees: Some Observations," DIMACS Workshop on Combinatorial Sturctures in Molecular Biology (1994).

COMMUNITY/UNIVERSITY ACTIVITIES:

- President of the Jewish Community Centre of Victoria (2006–present).

- Member of the Board of the Academic Women's Caucus of the University of Victoria (2007–present)