Mohammad R. Salavatipour

Curriculum Vitae (updated Dec 2011)

Personal Info

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Positions:

July 2009 - Present	Associate Professor, Department of Computing Science, University of Alberta
July 2010 - June 2011	On sabbatical leave at Toyota Tech. Inst. at Chicago
July 2004 - June 2009:	Assistant Professor, Department of Computing Science, University of Alberta
Sept 2003 - July 2004:	Postdoctoral fellow and instructor, Department of Combinatorics and Optimizations, University of Waterloo
Sept 2002 - Aug 2003:	Seasonal lecturer, Department of Computer Science, University of Toronto

Education

Ph.D. 2003:	Department of Computer Science, University of Toronto **Advisor:** Prof. Michael Molloy **Thesis:** Graph Colouring via The Discharging Method
M.Sc. 2000:	Department of Computer Science, University of Toronto **Advisor:** Prof. Derek G. Corneil **Thesis:** On Sum Coloring of Graphs
B.Sc. 1998:	Department of Computer Engineering, Sharif University of Technology **Advisor:** Prof. Mohammad Ghodsi **Thesis:** Parallel Delaunay Triangulation

Awards and Grants

- NSERC individual research grant, 2008-2013 ($24,000/year)
- Alberta Ingenuity New Faculty Award 2008-2011 ($96,000/year)
- NSERC individual research grant, 2005-2007 ($20,000/year)
- Department of Computing Science Research Excellence Award, 2007.
- Faculty Start-up grant, University of Alberta, 2004-2006 ($20,000/year)
- NSERC postdoctoral fellowship, 2003-2005 (used only for 1 year)
- Killam postdoctoral fellowship, University of Dalhousie 2003 (declined)
- Ontario Graduate Scholarship (OGS), 2002-2003

- University of Toronto Fellowship, 1998-1999, 2001-2002, and 2002-2003
- Gold medal in the 3rd Iranian National Computer Olympiad 1994 and a member of Iranian National team in International Olympiad in Informatics (IOI) 1994

Research Interests

Approximation Algorithms, Hardness of approximation, Combinatorics and Algorithmic Graph Theory, The Probabilistic Method, The Discharging Method.

Teaching Experience

University of Alberta:	Fall 2009: CMPUT 675, Topics on Algorithms and Combinatorial Optimization. Fall 2011,2007: CMPUT 675, Topics on Approximation Algorithms and Approximability. Fall 2009, 2007, 2005, 2004: CMPUT 204, Algorithms I. Winter 2009, 2007: CMPUT 272, Formal Systems and Logic in Computing Science. Fall 2005: CMPUT 675, Randomized and Probabilistic Algorithms. Winter 2005: CMPUT 675, Approximation Algorithms. Winter 2005: CMPUT 495, Honors Seminar.
University of Waterloo:	Fall 2003: Calculus I.
University of Toronto:	Summer 2003: Computational Complexity and Computability (CSC 364). Fall 2002: Discrete Mathematics for Computer Science (CSC 238).

Student/Postdocs supervision

Ph.D. and M.Sc. students supervised:

- Zachary Friggstad, Ph.D., Sept 2007 - Aug 2011.
  Thesis title: "Approximation Techniques for Unsplittable Flow and Traveling Salesmen Problems".
  Winner of departmental outstanding Ph.D. thesis award.
- Zhipeng Cai, Ph.D. (co-supervised with Guohui Lin), Sept 2004 - Aug 2008.
  Thesis title: "Feature Selection in Microarray Gene Expression Data Analysis and Contagious Viral Strain Computational Genotyping".
  Winner of 2008 Queen Elizabeth II Doctoral award and 2007 Departmental outstanding Research Achievement Award.
- Zachary Friggstad, M.Sc., Sept 2005 - Aug 2007.
  Thesis title: "Minimizing Movement in Mobile Facility Location Problems".
  Winner of departmental outstanding M.Sc. thesis award.
- Amin Jorati, Ph.D., Sept 2007 - present.
- Babak Behsaz, Ph.D., Sept 2007 - present.
- Saber Khakpash, M.Sc., Sept 2010 - present.

Postdocs supervised:

- Zoya Svitkina, Sept 2008 - June 2010 (now at Google).

- Imran Pirwani, Sept 2008 - June 2010 (now at Apple).
- MohammadAli Safari, Oct 2007 - Aug 2008 (now faculy at Sharif Univ. of Tech).

Publications

Note: Papers that have appeared both at a conference proceedings and then later at a journal appear only ONCE in the following list. In all the publications except [13,27,28,29], the authors' names have been in alphabetical order.

a) Articles Published or Accepted in Refereed Journals

[1] I. Pirwani and M.R. Salavatipour, *A PTAS for Minimum Clique Partition in Unit Disk Graphs*, To appear in Algorithmica. Earlier version in Proc. of SWAT 2010.

[2] R. Khandekar, G. Kortsarz, V. Mirrokni, and M.R. Salavatipour, *Approximation and hardness results for robust network design with exponential scenarios*, To appear in Algorithmica. Earlier version in Proc. of ESA 2008.

[3] M.A. Safari and M.R. Salavatipour, *A constant factor approximation for minimum λ-edge-connected k-subgraph with metric costs*, SIAM J. Discrete Math. 25 (3): 1089-1102 (2011). Earlier version in APPROX 2008.

[4] Z. Friggstad and M.R. Salavatipour, *Minimizing movement in mobile facility location problems*, ACM Transactions on Algorithms 7(3): 28 (2011). Earlier version in FOCS 2008.

[5] Z. Friggstad and M.R. Salavatipour, *Approximability of packing disjoint cycles*, Algorithmica 60(2): 395-400 (2011). Earlier version in ISAAC 2007.

[6] C. Chekuri, M. Hajiaghayi, G. Kortsarz, M. Salavatipour, *"Approximation algorithms for non-uniform buy-at-bulk network design"*, SIAM J. on Computing (SICOMP) 39(5):1772–1798, 2009. Earlier version in SODA 2007.

[7] L. Lau, S. Naor, M.R. Salavatipour, and M. Singh, *"Survivable network design with degree or order constraints"*, SIAM J. on Computing (special issue for selected papers of STOC 2007), Vol.39, No.3 pp 1062-1087, 2009.

[8] M. Hajiaghayi, G. Kortsarz, and M.R. Salavatipour, *"Approximating Buy-at-Bulk and Shallow-light k-Steiner tree"*, Algorithmica, Volume 53(1), pp 89-103. Earlier version in APPROX 2006.

[9] E. Demaine, U. Feige, M. Hajiaghayi, and M.R. Salavatipour, *"Combination can be hard: approximability of the unique coverage problem"*, SIAM J. on Computing, Volume 38, No 4, pp. 1464-1483. Earlier version in SODA 2006.

[10] M. Krivelevich, Z. Nutov, M.R. Salavatipour, J. Verstraete, and R. Yuster *"Approximation algorithms and hardness results for cycle packing problems"*, ACM Transactions on Algorithms, Volume 3(4), November 2007.

[11] J. Cheriyan and M.R. Salavatipour, *"Packing element-disjoint steiner trees"*, ACM Transactions on Algorithms, Volume 3(4), November 2007. Earlier version in APPROX 2005.

[12] M. Molloy and M.R. Salavatipour, *"The resolution complexity of random constraint satisfaction problems"*, SIAM J. on Computing 37(3): 895-922, 2007. Earlier version in FOCS 2003.

[13] Z. Cai, R. Goebel, M.R. Salavatipour, and G. Lin, *Selecting dissimilar genes for multi-class classification, an application in cancer subtyping*, BMC Bioinformatics 2007, 8(206), 15 pages.

[14] J. Cheriyan and M.R. Salavatipour, *"Hardness and approximation results for packing steiner trees"*, Algorithmica 45(1):21-43, 2006. The special issue for selected papers of ESA 2004.

[15] M.R. Salavatipour, *"Large induced forests in triangle-free planar graphs"*, Graphs and Combinatorics 22(1):113-126, 2006.

[16] M. Molloy and M.R. Salavatipour, *"A bound on the chromatic number of the square of a planar graph"*, J. of Combinatorial Theory (Series B), Volume 94(2), pp 189-213, 2005. Earlier version (with a different title) in ESA 2002.

[17] O.V. Borodin, A.N. Glebov, A. Raspaud, M.R. Salavatipour, *"Planar graphs without cycles of length from 4 to 7 are 3-colorable"*, J. of Combinatorial Theory (Series B), 93:303-311, 2005.

[18] M.R. Salavatipour, *"A (1+ϵ)-approximation algorithm for partitioning hypergraphs using a new algorithmic version of the Lovász local lemma"* , Random Struc. & Algorithms 25(1) 68-90, 2004. Earlier version in SODA 2003.

[19] M.R. Salavatipour, *"A polynomial time algorithm for strong edge coloring of partial k-trees"*, Discrete Applied Mathematics 143:(1-3) 285-291, 2004.

[20] M.R. Salavatipour, *"On sum coloring of graphs"*, Discrete Applied Math. 127(3) 477-488, 2003.

b) Articles Submitted

[21] Z. Friggstad, M.R. Salavatipour, and Z. Svitkina, *Asymmetric Traveling Salesman Path and Directed Latency Problems*, Submitted to SIAM J. on Computing. Earlier version appeared in SODA 2010.

[22] S. Har-Peled, A. Nayyeri, M. Salavatipour, and A. Sidiropoulos, *How to Walk Your Dog in the Mountains with No Magic Leash*, Manuscript submitted.

[23] B. Behsaz, M.R. Salavatipour, and Z. Svitkina, *New Approximation Algorithms for the Unsplittable Capacitated Facility Location Problem*, Manuscript submitted.

c) Articles in Refereed Conferences (without a journal version)

[24] M.R. Khani and M.R. Salavatipour, *Improved Approximations for Buy-at-Bulk and Shallow-light k-Steiner trees and (k,2)-subgraph* In Proc. Of ISAAC 2011.

[25] M.R. Khani and M.R. Salavatipour, *Improved Approximation algorithms for Min-max Tree Cover and Bounded Tree Cover Problems*, In Proc. Of APPROX 2011, LNCS 6845 pp 302-314.

[26] N. Bansal, Z. Friggstad, R. Khandekar, and M.R. Salavatipour, *A logarithmic approximation for unsplittable flow on line graphs*, In Proceedings of the Twentieth Annual ACM-SIAM Symposium on Discrete Algorithms (SODA) 2009.

[27] O. Madani, W. Greiner, D. Kempe, and M. Salavatipour, *"Recall systems: efficient learning and use of category indices"*, In Proceedings of the Eleventh International Conference on Artificial Intelligence and Statistics (AISTAT) 2007.

[28] Z. Cai, R. Goebel, M. Salavatipour, Y. Shi, Lizhe Xu, and G. Lin, *"Selecting genes with dissimilar discrimination strength for sample class prediction"*, In Proceedings of the Fifth Asia-Pacific Bioinformatics Conference (APBC) 2007, pp 81-90.

[29]Z. Cai, L. Xu, Y. Shi, M. Salavatipour, R. Goebel, and G. Lin, *"Using gene clustering to identify discriminatory genes with higher classification accuracy"*, In Proceedings of IEEE 6th Symposium on Bioinformatics and Bioengineering (BIBE) 2006, pp 235-242.

[30] C. Chekuri, M. Hajiaghayi, G. Kortsarz, M. Salavatipour, *"Approximation algorithms for non-uniform buy-at-bulk network design problems"*, In Proceedings of the 47th Annual IEEE Symposium on Foundations of Computer Science (FOCS) 2006, pp 677-686.

[31] M.R. Salavatipour and J. Verstraete, *"Disjoint cycles: integrality gap, hardness, and approximation"*, In Proceedings of the Eleventh Conference on Integer Programming and Combinatorial Optimization (IPCO) 2005, pp 51-65.

[32] K. Jain, M. Mahdian, and M.R. Salavatipour, *"Packing steiner trees"*, In Proceedings of the fourteenth Annual ACM-SIAM Symposium on Discrete Algorithms (SODA) 2003, pp 266-274.

d) Non-refereed Contributions

[33] M.R. Salavatipour, *"The three color problem for planar graphs"*, Technical Report CSRG-458, Department of Computer Science, University of Toronto, 2002.

e) Theses

[34] M.R. Salavatipour, *"Graph Colouring via the Discharging Method"*, Ph.D. thesis, Department of Computer Science, University of Toronto, Aug 2003.

[35] M.R. Salavatipour, *"On Sum Coloring of Graphs"*, M.Sc thesis, Department of Computer Science, University of Toronto, Jan 2000.

f) Patents

"Packing Steiner trees", joint with K. Jain and M. Mahdian, patent No. 302152.01, Filed 11/20/2003 in USA.

Professional Activities

Member of Program/Organizing Committee for:
Workshop on Approximation Algorithms and Hardness of Approximation (Banff, Canada, 2011).
First Canadian Discrete and Algorithmic Mathematics Conference (2007),
International Computing and Combinatorics Conference (COCOON 2007 and 2009),

Referee/Review for the Following Journals/Conferences/Grant Agencies:

Journals and Conferences: SIAM J. on Computing, SIAM J. on Discrete Math, J. of Combinatorial Theory (Series B), ACM Transactions on Algorithms, J. of Graph Theory, Theory of Computing, Algorithmica, J. of Discrete Algorithms, Discrete Applied Mathematics, Discrete Mathematics, Networks, Discrete Optimization, Electronic J. of Combinatorics, IEEE FOCS, ACM STOC, ACM/SIAM (SODA), Symposium on Theoretical Aspects of Computer Science (STACS), European Symposium on Algorithms (ESA), Workshop on Approximation Algorithms for Combinatorial Optimization Problems (APPROX), International Colloquium on Automata, Languages and Programming (ICALP), Conference on Integer Programming and Combinatorial Optimization (IPCO), International Symposium on Algorithms and Computation (ISAAC), Italian Conference on Theoretical Computer Science (ICTCS).

Grant Agencies: NSERC, Israel Science Foundation (ISF), National Security Agency Mathematical Sciences Program (NSA).

Collaborators

The list of my 41 collaborators in alphabetic order:
Nikhil Bansal (IBM research), Oleg Borodin (Institute of Mathematics, Novosibirsk, Russia), Zhipeng Cai (University of Alberta), Chandra Chekuri (University of Illinois at Urbana-Champaign), Joseph

Cheriyan (University of Waterloo), Erik Demaine (MIT), Uriel Feige (Weizmann Inst), Zachary Friggstad (University of Alberta), Alexei Glebov (Institute of Mathematics, Novosibirsk, Russia), Randy Goebel (University of Alberta), Wile Greiner (Los Angeles Software), Mohammadtaghi Hajiaghayi (AT&T Research), Sariel Har-Peled (UIUC), Kamal Jain (Microsoft Research), David Kempe (University of Southern California), Rohit Khandekar (IBM Research), M. Reza Khani (U. Maryland), Guy Kortsarz (Rutgers University), Michael Krivelevich (Tel Aviv University), Lap Chi Lau (Chinese University of Hong Kong), Guohui Lin (University of Alberta), Omid Madani (Yahoo! Research), Mohammad Mahdian (Yahoo! Research), Ebad Mahmoodian (Sharif University of Tech.), Michael Molloy (University of Toronto), Vahab Mirrokni (Microsoft Research), Seffi Naor (Microsoft Research and Technion, Israel), Amir Nayyeri (University of Illinois at Urbana Champaign), Zeev Nutov (Open University of Israel), Imran Pirwani (University of Alberta), Andre Raspaud (Université Bordeaux, France), Amin Saberi (Stanford University), MohammadAli Safari (University of Alberta), Yi Shi (University of Alberta), Mohit Singh (Carnegie Mellon University), Anastasios Sidiropoulos (Toyota Tech. Inst, Chicago), Zoya Svitkina (University of Alberta), Roozbeh Tusserkani (Sharif University of Tech.), Jacques Verstraete (University of California, San Diego), Lizhe Xu (University of Alberta), Raphael Yuster (University of Haifa).