Ojas Parekh

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Research Interests

Approximation algorithms, combinatorial optimization, polyhedral combinatorics, mathematical programming, scientific computing

Education

1997–2002	**Carnegie Mellon University** Ph.D. in Algorithms, Combinatorics, and Optimization Thesis: *Polyhedral Techniques for Graphic Covering Problems* Advisor: R. Ravi	Pittsburgh, PA
1997–1999	M.S. in Algorithms, Combinatorics, and Optimization	
1995–1997	**Georgia Institute of Technology** B.S. in Discrete Mathematics, Summa Cum Laude	Atlanta, GA

Positions

2003–	**Emory University** Assistant Professor of Computer Science	Atlanta, GA
2002–2003	**Sandia National Labs** Postdoctoral appointment in the Discrete Mathematics and Optimization group	Albuquerque, NM
Summer 1999 Summer 1998	**Sandia National Labs** Graduate intern with the Discrete Mathematics and Optimization group	Albuquerque, NM
1995–1996	**VCom Systems**, Self-employed Designed a low-level Windows 95 device driver which emulates a serial UART and modem over the TCP/IP telnet protocol.	Atlanta, GA

Publications

("*" - selected publication, "s" - submitted, "c" - conference, "j" - journal)

[18s] *Approximation algorithms for k-hurdle problems*, with B. C. Dean, A. Griffis, and A. A. Whitley. Invited for submission to a special issue of *Algorithmica*, 12 pages, 2008.

[17s] *Max-weight integral multicommodity flow in spiders and high-capacity trees*, with J. Könemann and D. Pritchard. To be submitted to *Algorithmica*, 14 pages, 2008.

[17c] *Max-weight integral multicommodity flow in spiders and high-capacity trees*, with J. Könemann and D. Pritchard. To appear in *Proceedings of the 6th Workshop on Approximation and Online Algorithms*, 14 pages, 2008.

[16j] *Approximation algorithms for partially covering with edges*. *Theoretical Computer Science*, 400(1-3):159–168, 2008.

[15j*] *Compacting cuts: a new linear formulation for minimum cut*, with R. Carr, G. Konjevod, D. G. Little, and V. Natarajan. *ACM Transactions on Algorithms*, 2009.

To appear in a special issue dedicated to select papers invited from SODA 2007, 15 pages.

[15c] *Compacting cuts: a new linear formulation for minimum cut*, with R. Carr, G. Konjevod, D. G. Little, and V. Natarajan. In *Proceedings of the 18th Annual Symposium on Discrete Algorithms*, pages 43–52, 2007.

Invited for submission to a special issue of ACM Transactions on Algorithms.

[14s*] *A unified approach to approximating partial covering problems*, with J. Könemann and D. Segev. Acceptance to *ACM Transactions on Algorithms* pending revision, 19 pages, 2008.

[14c] *A unified approach to approximating partial covering problems*, with J. Könemann and D. Segev. In *Proceedings of the 14th European Symposium on Algorithms*, pages 468–479, 2006.

Invited for submission to a special issue of Algorithmica.

[13j] *Path hitting in acyclic graphs*, with D. Segev. Accepted to *Algorithmica* and in press, 21 pages, 2008.

[13c] *Path hitting in acyclic graphs*, with D. Segev. In *Proceedings of the 14th European Symposium on Algorithms*, pages 564–575, 2006.

[12j] *Approximability of the capacitated b-edge dominating set problem*, with A. Berger, T. Fukunaga, and H. Nagamochi. *Theoretical Computer Science*, 385(1-3):202–213, 2007.

[11j*] *Linear time algorithms for generalized edge dominating set problems*, with A. Berger. *Algorithmica*, 50(2):244–254, 2008.

Appears in a special issue dedicated to select papers invited from WADS 2005.

[11c] *Linear time algorithms for generalized edge dominating set problems*, with A. Berger. In *Proceedings of the 9th Biennial Workshop on Algorithms and Data Structures*, pages 233–243, 2005.

Invited for submission to a special issue of Algorithmica.

[10c] *Finding effective support-tree preconditioners*, with B. Maggs, G. Miller, R. Ravi, and S. Woo. In *Proceedings of the 17th Annual ACM Symposium on Parallelism in Algorithms and Architectures*, pages 176–185, 2005.

[9j*] *A 1/2-integral relaxation for the A-matching problem*, with R. Carr. *Operations Research Letters*, 34(4):445–450, 2006.

[8j] *On factor width and symmetric H-matrices*, with E. G. Boman, D. Chen, and S. Toledo. *Linear Algebra and its Applications*, 405:239–248, 2005.

[7j*] *Forestation in hypergraphs: Linear k-trees*. *The Electronic Journal of Combinatorics*, 10(1), 2003.

[6c] *A randomized algorithm to minimize the elapsed query time in databases with expensive predicates*, with E. Laber and R. Ravi. In *Proceedings of the 10th Annual European Symposium of Algorithms*, pages 649–661, 2002.

[5c*] *Edge dominating and hypomatchable sets*. In *Proceedings of the 13th Annual Symposium on Discrete Algorithms*, pages 287–291, 2002.

[4j] *An approximation algorithm for the edge-dilation k-center problem,*, with J. Könemann, Y. Li, and A. Sinha. *Operations Research Letters*, 32(5):491–495, 2004.

[4c] *Approximation algorithms for router location problems*, with J. Könemann, Y. Li, and A. Sinha. In *Proceedings of the 8th Biennial Scandinavian Workshop on Algorithm Theory*, pages 210–219, 2002.

[3j] *Improved approximations for tour and tree covers*, with J. Könemann, G. Konjevod, and A. Sinha. *Algorithmica*, 38(3):441–449, 2003.

Appears in a special issue dedicated to select papers invited from APPROX 2000.

[3c] *Improved approximations for tour and tree covers*, with J. Könemann, G. Konjevod, and A. Sinha. In *Proceedings of the 3rd Annual Workshop on Approximation Algorithms for Combinatorial Optimization*, pages 184–193, 2000.

Invited for submission to a special issue of Algorithmica.

[2j*] *A 2 1/10-approximation algorithm for a generalization of the weighted edge-dominating set problem*, with R. Carr, T. Fujito, and G. Konjevod. *Journal of Combinatorial Optimization*, 5(3):299–315, 2001.

[2c] *A 2 1/10-approximation algorithm for a generalization of the weighted edge-dominating set problem*, with R. Carr, T. Fujito, and G. Konjevod. In *Proceedings of the 8th Annual European Symposium of Algorithms*, pages 132–142, 2000.

[1j] *A survey and new results in renegotiated service*, with E. Zegura and S. McFarland. *Journal of High Speed Networks*, 6(3), 1997.

Ellen Zegura is the lead author: this research was conducted in a different field whilst an undergraduate student under the guidance of Prof. Zegura.

Support

Grants	*Polyhedral frameworks for approximation algorithms*, $100,000 NSF CCF Theoretical Foundations program, 9/2008-9/2010
	Robots, iPods, and Legos in Computer Science Education, $8,100 Emory University Teaching Fund, 2006
Contracts	*Massively Parallel Linear Programming*, $85,000 Sandia National Labs Directed Research and Development project, 2003–2006
Assistantships	Partially supported by NSF GIG grant DMS-9509581 and NSF-CNPq collaborative research grant CCR-9900304, 1997–2002
Scholarships	Georgia Tech Dean's & Georgia HOPE scholarships, 1995–1997
Awards	Pi Mu Epsilon, honorary mathematics fraternity, undergraduate award, 1997

Invited presentations

Oct. 2008	Clemson University, Clemson, SC 23rd Clemson mini-conference on Discrete Math and Algorithms: *Approximation algorithms for edge dominating set problems*
Apr. 2008	Carnegie Mellon University, Pittsburgh, PA ACO Seminar: *A more compact polyhedral formulation for minimum cut*
Apr. 2008	West Virginia University, Morgantown, WV Invited seminar: *A more compact polyhedral formulation for minimum cut*
Feb. 2008	Clemson University, Clemson, SC Invited seminar: *A more compact polyhedral formulation for minimum cut*
Nov. 2007	Inst. for Oper. Res. and Manag. Sci. Annual Meeting, Seattle, WA Invited cluster presentation: *A more compact formulation for minimum cut*
Jun. 2007	University of Waterloo, Dept. of Combinatorics and Optimization Tutte Seminar: *A more compact polyhedral formulation for minimum cut*
Aug. 2006	19th International Symposium on Math. Prog., Rio De Janeiro, Brazil Invited cluster presentation: *A new linear formulation for minimum cut*
Jul. 2006	Instituto Superior Tecnico, Lisbon, Portugal Invited seminar: *A new linear formulation for minimum cut*
Jul. 2006	DIMACS Workshop on COIN-OR, Rutgers University, Piscataway, NJ *Optimizing PICO's CLP Interface*
Feb. 2005	SIAM Comput. Sci. and Eng. Conference, Orlando, FL Invited minisymposium presentation: *Spectral bounds on factor width*

Oct. 2001 Universidade Federal, Rio de Janeiro, Brazil
Invited seminar: *Combinatorial preconditioners for sparse linear systems*

Teaching **Emory University** Atlanta, GA

Fall 2008	Freshman seminar on Robotics
Fall 2007	Freshman seminar on Robotics and Grad. Theory of Comp.
Spring 2007	Undergrad. and Grad. Theory of Comp.
Fall 2006	Freshman seminar on Robotics
Spring 2006	Grad. Seminar: Combinatorial Optimization
Fall 2005	Introduction to CS I (through Java)
Spring 2005	Introduction to CS II (through Java and C) and Grad. Theory of Comp.
Fall 2004	Introduction to CS I (through Java)
Spring 2004	Introduction to CS I (through Java) and Theory of Comp.
Fall 2003	Mathematical Foundations of CS

Professional activities

Program comm. Latin American Theoretical Informatics Symposium, 2008
IEEE International Parallel and Distributed Processing Symposium, 2008

Refereeing I typically review 2–5 journal papers and 2–3 conference papers per year.

Journals: ACM Transactions on Algorithms, ACM Transactions on Mathematical Software, Discrete Mathematics, Discrete Optimization, Information and Computation, Journal of Discrete Algorithms, Utilitas Mathematica

Conferences: APPROX, COCOON, ESA, FOCS, LATIN, ICALP, SODA, SWAT, WAOA

Service

Advisees Andre Berger, Math Ph.D., 2003–2006 (co-advised with Mic Grigni)
Thesis: *Faster Minimum Weight Subgraph Algorithms*
Assistant Professor at University of Maastricht; completed postdoc at TU Berlin

Thesis Comm. I have served on four thesis committees in 2005 (3 CS M.S. and 1 honors), two thesis commitees in 2006 (1 Math Ph.D. and 1 CS M.S.), and one Math Ph.D. thesis committee in 2008.