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Computer Science and Engineering
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A. BACKGROUND

i. EDUCATION

- (Aug 92 – June 98) Carnegie Mellon University (Pittsburgh, Pennsylvania)
Ph.D. in Algorithms, Combinatorics and Optimization, School of Computer
Science, Advisor: Prof. Bruce Maggs.
Thesis title: *On Distributed Network Resource Allocation*
- (Aug 92 – Aug 95) Carnegie Mellon University (Pittsburgh, Pennsylvania)
M.Sc. in Algorithms, Combinatorics and Optimization, School of Computer
Science
- (Mar 89 – Feb 92) Federal University of Rio de Janeiro (Rio de Janeiro, Brazil)
M.Sc. in Systems and Computer Eng., emphasis in Algorithms/Combinatorics,
COPPE. Advisor: Jayme L. Szwarcfiter.
Thesis title: *Generation and Enumeration of Linear Extensions of Partially Ordered
Sets*
- (Jan 85 – July 89) Federal University of Rio de Janeiro (Rio de Janeiro, Brazil)
B.S. cum laude in Computer Science

ii. ACADEMIC EXPERIENCE

- (Aug 04 – Present) Associate Professor, tenured- Arizona State University (Tempe, Arizona)
- (Aug 98 – July 04) Assistant Professor- Arizona State University (Tempe, Arizona)
- (June – July 01) Visiting Professor at University of Nice/ INRIA, hosted by Dr. Afonso Ferreira.
(Nice, France)
- (Nov – Dec 96) Visiting Researcher at DIMACS (Center for Discrete Math. And Computer Sci.),
hosted by Dr. Satish Rao, NEC Research Institute (Princeton, New Jersey)
- (June – Sep 96) Visiting Researcher, Computer Sci. Dept., University of Texas at Austin, hosted by
Prof. Greg Plaxton. (Austin, Texas)
- (June – Sep 94) Visiting Researcher at DIMACS, hosted by Prof. R.E. Tarjan, Princeton
University (Princeton, New Jersey)
- (July – Aug 93) Teaching Assistant, Andrew's Leap Program, Carnegie Mellon University.
(Pittsburgh, Pennsylvania)

iii. PRINCIPAL AREAS OF RESEARCH AND TEACHING

Teaching	Algorithms and Data Structures; Distributed Computing; Network Algorithms; Combinatorial Optimization
Research	Design and Analysis of Algorithms: network algorithms; graph algorithms; randomized and approximation algorithms; Distributed Computing; Wireless Ad-Hoc Networks; Overlay Networks; Combinatorial Optimization;

B. PUBLICATIONS

(In the Algorithms/Theory of Computing publications below, the list of authors appears in *alphabetical order*, and not with respect to the contribution of each author to the paper. Student co-authors at the time the paper was written are indicated in *bold*. Whenever available, I indicated the *acceptance rates* for *full papers* at the respective conferences.)

i. REFEREED ARCHIVAL JOURNAL PAPERS

- Melih Onus and Andréa W. Richa. Minimum Degree Publish-Subscribe Overlay Network Design. To appear in *IEEE Transactions on Networking*, volume 19(5), pages 1331-1343, 2011.
- Goran Konjevod, Andréa W. Richa, and **Donglin Xia**. Scale-free Compact Routing Schemes in Networks of Low Doubling Dimension. To appear in *ACM Transactions on Algorithms* (invited submission).
- **L. Ritchie, S. Deval**, A. Richa and M. Reisslein. Evaluation of Physical Carrier Sense Based Spanner Construction and Maintenance as well as Broadcast and Convergecast in Ad Hoc Networks. *Ad Hoc Networks*, volume 7(7), pages 1347-1369, 2009.
- **S. Deval, L. Ritchie**, A. Richa and M. Reisslein. Evaluation of Physical Carrier Sense Based Spanner Maintenance in Mobile Ad Hoc Networks. *International Journal of Vehicular Technology*, vol. 2009, Article ID 958056, 13 pages, 2009. doi:10.1155/2009/958056.
- **S. Oh, Y. Huh, B. Kulapala**, A. Richa and M. Reisslein. Continuous-Time Collaborative Prefetching of Continuous Media. *IEEE Transactions on Broadcasting*, volume 54, issue 1, pages 36-52, 2008.
- **H.-S. Yang, L. Ritchie**, A. Richa and M. Reisslein. MANET Routing with Provably Low Complexity Through Constant Density Clustering and Route Request Broadcast, *Wireless Personal Communications*, Volume 43, Number 2, pages 605-621, October 2007.
- **L. Ritchie, H.-S. Yang**, A.W. Richa, and M. Reisslein. Cluster Overlay Broadcast (COB): MANET Routing with Complexity Polynomial in Source-Destination Distance. *IEEE Transactions on Mobile Computing*, Volume 5, Issue 6, pages 653 - 667, June 2006.
- **Hai Huang**, Andréa W. Richa, Michael Segal. Dynamic Coverage in Ad-Hoc Sensor Networks. *ACM Baltzer Journal on Mobile Networks and Applications (MONET)* 10(1-2): 9-17 (2005).
- **S. Oh, Y. Huh, B. Kulapala**, G. Konjevod, A.W. Richa, M. Reisslein. A modular algorithm-theoretic framework for the fair and efficient collaborative prefetching of continuous media. *IEEE Transactions on Broadcasting*, volume 51 issue 2, pages 200- 215, 2005.
- S. Rao and A. W. Richa. New Approximation Techniques for Some Linear Ordering Problems. *SIAM Journal of Computing*, Volume 34, Number 2, pages 388 - 404, 2005.
- **H. Huang**, A.W. Richa, and M. Segal. Approximation Algorithms for the Mobile Piercing Set Problem with Applications to Clustering in Ad-Hoc Networks. *ACM Baltzer Journal on Mobile Networks and Applications (MONET)*, Volume 9, Number 2, pages 151-161, April 2004.
- A. Ferreira, S. Perennes, A.W. Richa, **H. Rivano**, and **N. Stier**. Models, complexity, and algorithms for the design of multifiber WDM networks. *Telecommunication Systems* 24(2-4): 123-138 (2003).
- F. T. Leighton, B. M. Maggs, and **A. W. Richa**. Fast Algorithms for Finding $O(\text{Congestion} + \text{Dilation})$ Packet Routing Schedules, *Combinatorica*, 19(2):1--27, 1999.
- C. G. Plaxton, **R. Rajaraman**, and **A. W. Richa**. Accessing Nearby Copies of Replicated Objects in a Distributed Environment, *Theory of Computing Systems (TOCS)*, 32:241-280, 1999. (Invited submission)
- B. Ghosh, F. T. Leighton, B. M. Maggs, S. Muthukrishnan, C. G. Plaxton, **R. Rajaraman, A. W. Richa**, R. E. Tarjan, and D. Zuckerman. Tight Analysis of Two Local Load Balancing Algorithms. *SIAM Journal on Computing*, 29(1), pages 29-64, 1999.

ii. INTERNATIONAL CONFERENCE PROCEEDINGS REFEREED PAPERS

- Andrea Richa, Christian Scheideler, Stefan Schmid, and **Jin Zhang**. Self-Stabilizing Leader Election for Single-Hop Wireless Networks despite Jamming. In *Proceedings of the 12th ACM International Symposium on Mobile Ad Hoc Networking and Computing (MOBIHOC)*, 2011.
- Andréa W. Richa, Stefan Schmid, Christian Scheideler, and **Jin Zhang**. Competitive and Fair Medium Access despite Reactive Jamming. To appear in *Proceedings of the IEEE 31st International Conference on Distributed Computing Systems (ICDCS)*, pages 507-516, 2011. Acceptance rate: ~13%.
- Goran Konjevod, Andréa W. Richa, Donglin Xia, Ling Zhou. Brief Announcement: Randomized compact routing in decomposable metrics. In *Proceedings of the ACM Symposium on Principles of Distributed Computing (PODC)*, pages 351-352, 2011.
- Andréa W. Richa, Christian Scheideler, **Phillip Stevens**. Self-Stabilizing De Bruijn Networks. In *Proceedings of the 13th International Symposium on Stabilization, Safety, and Security of Distributed Systems (SSS)*, pages 416-430, 2011.
- Andréa W. Richa, Stefan Schmid, Christian Scheideler, and **Jin Zhang**. A Jamming Resistant MAC Protocol for Multi-Hop Wireless Networks. In *Proceedings of the 24th International Symposium on Distributed Computing (DISC)*, pages 179-193, 2010.
- Fabian Kuhn, Nancy Lynch, Calvin Newport, **Rotem Oshman**, Andrea Richa. Broadcasting in Radio Networks with Unreliable Communication. In *Proceedings of the 29th ACM Symposium on Principles of Distributed Computing (PODC)*, July, 2010. Acceptance rate: 22%.
- Andréa W. Richa, Stefan Schmid, Christian Scheideler, and **Jin Zhang**. Brief Announcement: A Jamming Resistant MAC Protocol for Multi-Hop Wireless Networks. In *Proceedings of the 29th ACM Symposium on Principles of Distributed Computing (PODC)*, July, 2010.
- Melih Onus and Andréa W. Richa. Parameterized Minimum Degree Publish-Subscribe Overlay Network Design. In *Proceedings of the 30th IEEE International Conference on Distributed Computing Systems (ICDCS)*, June, 2010. Acceptance rate: 14%.
- **Dominik Gall**, Riko Jacob, Andrea Richa, Christian Scheideler, Stefan Schmid, and **Hanjo Taeubig**. On the Time Complexity of Distributed Topological Self-Stabilization. In *Proceedings of LATIN'10*, pages 294-305, 2010.
- **Melih Onus** and Andréa W. Richa. Minimum Degree Publish-Subscribe Overlay Network Design. In *Proceedings of the IEEE 28th Conference on Computer Communications (INFOCOM)*, pages 882-890, 2009. Acceptance rate: 19.6%.
- Riko Jacob, Andrea Richa, Christian Scheideler, Stefan Schmid, and **Hanjo Täubig**. A Polylogarithmic Time Construction for Distributed Self-Stabilizing Skip Graphs. In *Proceedings of ACM Symposium on Principles of Distributed Computing (PODC)*, pages 131-140, 2009. Acceptance rate: 25%.
- **Melih Onus** and Andréa W. Richa. Brief Announcement: Parameterized Maximum and Average Degree Approximation in Topic-based Publish-Subscribe Overlay Network Design. In *Proceedings of the 21st ACM Symposium on Parallelism in Algorithms and Architectures (SPAA)*, pages 39-40, 2009.
- **Dominik Gall**, Riko Jacob, Andrea Richa, Christian Scheideler, Stefan Schmid, and **Hanjo Taeubig**. Brief Announcement: On the Time Complexity of Distributed Topological Self-Stabilization. To appear in *Proceedings of the 11th International Symposium on Stabilization, Safety, and Security of Distributed Systems (SSS)*, pages 781-782, 2009.
- Christian Scheideler, Andréa W. Richa, and Paolo Santi. An $O(\log n)$ Dominating Set Protocol for Wireless Ad-Hoc Networks under the Physical Interference Model. In *Proceedings of the 9th ACM Symposium on Mobile Ad Hoc Networking and Computing (MobiHoc)*, pages 91-100, 2008. Acceptance rate: 14.6%.
- Baruch Awerbuch, Andréa W. Richa and Christian Scheideler. A Jamming-Resistant MAC Protocol for Single-Hop Wireless Networks. In *Proceedings of ACM Symposium on Principles of Distributed Computing (PODC)*, pages 45-54, 2008.

- Goran Konjevod, Andréa W. Richa, **Donglin Xia**. Dynamic Routing and Location Services in Low Doubling Dimension . In *Proceedings of the 22nd International Symposium on Distributed Computing (DISC)*, pages 379-393, 2008.
- Goran Konjevod, Andréa W. Richa, **Donglin Xia**. Brief Announcement: Dynamic Routing and Location Services in Low Doubling Dimension. In *Proceedings of ACM Symposium on Principles of Distributed Computing (PODC)*, page 417, 2008.
- Goran Konjevod, Andréa W. Richa, **Donglin Xia, Hai Yu**. Compact routing with slack in low doubling dimension . In *Proceedings of ACM Symposium on Principles of Distributed Computing (PODC)*, pages 71-80, 2007. Acceptance rate: 16%.
- Goran Konjevod, Andréa W. Richa, and **Donglin Xia**. Optimal scale-free compact routing schemes in doubling networks . In *Proceedings of ACM-SIAM Symposium on Discrete Algorithms (SODA)*, pages 939-948, 2007. Acceptance rate: 33%.
- **Melih Onus**, Andrea W. Richa, and Christian Scheideler,. Linearization: Locally Self-Stabilizing Sorting in Graphs. In *Proceedings of ACM Workshop on Experimental Algorithms ALENEX'07*, 2007.
- G. Konjevod, A.W. Richa, **D. Xia**. Optimal Stretch Name-Independent Compact Routing in Doubling Metrics. In *Proceedings of 18th ACM Symposium on Principles of Distributed Computing (PODC)*, pages 198-207, 2006. Acceptance rate: 24%.
- **T-H. H. Chan, D. Xia**, G. Konjevod, A. Richa. A Tight Lower Bound for Steiner Point Removal Problem on Trees , In *Proceedings of APPROX-RANDOM* , pages 70-81, 2006.
- **D. Xia**, G. Konjevod, and A. Richa. On sampling in higher-dimensional peer-to-peer systems. In *Proceedings of LATIN'06*, pages 641-652, 2006.
- **Kishore Kothapalli, Melih Onus**, Andrea W. Richa, Christian Scheideler. Constant density spanners for wireless ad-hoc networks. In *Proceedings of the 17th ACM Symposium on Parallelism in Algorithms and Architectures (SPAA)*, pages 116-125, 2005.
- **K. Kothapalli, M. Onus**, A. Richa and C. Scheideler. Efficient Broadcasting and Gathering in Wireless Ad Hoc Networks. In *Proceedings of the IEEE International Symposium on Parallel Architectures, Algorithms and Networks (ISPAN)*, pages 346-351, 2005.
- **Liang Yang, Tushar Gohad, Pavel Ghosh, Devesh Sinha**, Arunabha Sen, Andrea Richa. Resource mapping and scheduling for heterogeneous network processors. In *Proceedings of the 2005 ACM Symposium on Architecture for networking and communications systems (ANCS)*, 2005.
- A. Ferreira, S. Perennes, A.W. Richa, **H. Rivano**, and **N. Stier**. Models, complexity, and algorithms for the design of multifiber WDM networks. In *Proceedings of IEEE International Conference on Telecommunications (ICT)*, pages 12--18, 2003.
- **H. Huang**, A.W. Richa, and M. Segal. Approximation Algorithms for the Mobile Piercing Set Problem with Applications to Clustering. In *Proceedings of 6th ACM Workshop on Discrete Algorithms and Method for Communication (DIAL-M)*, pages 52-61, August 2002.
- A. Ferreira, S. Perennes, A.W. Richa, **H. Rivano**, and **N. Stier**. On the design of multifiber WDM networks. In *Proceedings of AlgoTel'02*, pages 25--32, France, 2002.
- Goran Konjevod, **Soohyun Oh**, and Andréa W. Richa. Finding Most-Sustainable Paths in Networks with Time-Dependent Edge-Reliabilities . In *Proceedings of Latin American Theoretical Informatics (LATIN)*, pages 435-450, 2002.
- A.W. Richa, K. Obraczka, and A. Sen. Application-oriented Self-organizing Hierarchical Clustering in Dynamic Networks. In *Proceedings of 1st ACM Workshop on Principles of Mobile Computing (POMC)*, pages 57-65, 2001.
- R. Rajaraman, A.W. Richa, B. Voecking, and **G. Vuppuluri**. A data tracking scheme for general networks. In *Proceedings of 13th Annual ACM Symposium on Parallel Algorithms and Architectures (SPAA)*, pages 247-254, 2001.
- A. W. Richa, A. Sen, **B. H. Shen**, and S. Bandyopadhyay. On Routing and Wavelength Assignment in Optical Networks. In *Proceedings of the Thirty-Eighth Annual Allerton Conference on Communication, Control and Computing*, pages 2000.

- S. Rao and **A. W. Richa**. New Approximation Techniques for Some Ordering Problems. In *Proceedings of Ninth Annual ACM-SIAM Symposium on Discrete Algorithms (SODA)*, pages 211-218, 1998.
- R. Cole, B. M. Maggs, F. Meyer auf der Heide, M. Mitzenmacher, **A. W. Richa**, K. Schroder, R. K. Sitaraman, and B. Vocking. Randomized Protocols for Low-Congestion Circuit Routing in Multistage Interconnection Networks. In *Proceedings of the 30th Annual Symposium on the Theory of Computing (STOC)*, pages 378-388, 1998.
- R. Cole, A. Frieze, B. M. Maggs, M. Mitzenmacher, **A. W. Richa**, R. K. Sitaraman, and E. Upfal. On Balls and Bins with Deletions. In *Proceedings of the Second International Workshop on Randomization and Approximation Techniques in Computer Science (RANDOM)*, number 1518 in Lecture Notes in Computer Science, pages 145-158, 1998.
- C. G. Plaxton, **R. Rajaraman**, and **A. W. Richa**. Accessing Nearby Copies of Replicated Objects in a Distributed Environment, In *Proceedings of Ninth ACM Symposium on Parallel Algorithms and Architectures (SPAA)*, pages 311-320, 1997.
- B. Ghosh, F. T. Leighton, B. M. Maggs, S. Muthukrishnan, C. G. Plaxton, **R. Rajaraman**, **A. W. Richa**, R. E. Tarjan, and D. Zuckerman. Tight Analysis of Two Local Load Balancing Algorithms, In *Proceedings of the 27th Annual Symposium on the Theory of Computing (STOC)*, pages 548-558, 1995.

iii. BOOK PUBLISHING

(a) Edited Books

- Network Science for Communication Networks, Springer Verlag, to appear.
- Proceedings of the 29th Annual ACM Symposium on Principles of Distributed Computing (PODC), 2010
- Proceedings of Second IEEE Workshop on Network Science for Communication Networks (NetSciCom), 2010
- Proceedings of First IEEE Workshop on Network Science for Communication Networks (NetSciCom), 2009
- Proceedings of ACM DIALM-POMC Joint Workshop on Foundations of Mobile Computing (DIALM-POMC), 2010, to appear.
- Proceedings of ACM DIALM-POMC Joint Workshop on Foundations of Mobile Computing (DIALM-POMC), 2003

(b) Book Chapters

- A.W. Richa and C. Scheideler. Overlay Networks for Peer-to-peer systems. In Teofilo Gonzales (Editor), *Handbook of Approximation Algorithms and Metaheuristics*, Chapman & Hall / CRC Press, Chapter 72, 2007.
- M. Mitzenmacher, A. Richa, and R. Sitaraman. The power of two random choices: A survey of the techniques and results. In *Handbook of Randomized Computing*, volume I, edited by P. Pardalos, S. Rajasekaran, and J. Rolim, pages 255-305, Kluwer Press, 2000.

iv. OTHER PUBLICATIONS

(a) Submitted papers

- **Dominik Gall**, Riko Jacob, Andrea Richa, Christian Scheideler, Stefan Schmid, and **Hanjo Taeubig**. On the Time Complexity of Distributed Topological Self-Stabilization. Submitted to journal *ACM Transactions on Algorithms*, August 2010.
- Riko Jacob, Andrea Richa, Christian Scheideler, Stefan Schmid, and **Hanjo Täubig**. A Polylogarithmic Time Construction for Distributed Self-Stabilizing Skip Graphs. Submitted to journal *SIAM Journal on Computing (SICOMP)*, August 2010.
- Andréa W. Richa, Stefan Schmid, Christian Scheideler, and **Jin Zhang**. A Jamming Resistant MAC Protocol for Multi-Hop Wireless Networks. Submitted to journal *Distributed Computing*, invited submission (selected papers from DISC 2010), 2010.

(b) Technical Reports (Recent, 2008-10)

- Fabian Kuhn, Nancy Lynch, Calvin Newport, **Rotem Oshman**, and Andrea Richa. Broadcasting in Unreliable Radio Networks. Technical Report MIT-CSAIL-TR-2010-029, MIT Computer Science and Artificial Intelligence Laboratory, Cambridge, MA, June 2010.
- Andrea Richa, Christian Scheideler, Stefan Schmid, **Jin Zhang**. AntiJam: Efficient Medium Access despite Adaptive and Reactive Jamming. Technical Report arXiv, ID arXiv:1007.4389, July 2010.
- Andrea Richa, Christian Scheideler, Stefan Schmid, **Jin Zhang**. A Jamming-Resistant MAC Protocol for Multi-Hop Wireless Networks. Technical Report arXiv, ID arXiv:1007.1189, July 2010
- **Dominik Gall**, Riko Jacob, Andrea Richa, Christian Scheideler, Stefan Schmid, and **Hanjo Täubig**. Modeling Scalability in Distributed Self-Stabilization: The Case of Graph Linearization. Technical Report TUM-I0835, Institut für Informatik, Technische Universität München, November 2008.

v. INVITED PRESENTATIONS

- **Plenary Speaker**, *Interference Models: Going Beyond the Unit-disk and Packet-Radio Models*, 6th International Conference on AD-HOC Networks & Wireless (**AD-HOC NOW**), 2007.
- **Tutorial** *Algorithmic Foundations of Ad Hoc Networks*, MICS Summer School, ETH Zurich, June 30 – July 04, 2004.
- *Minimum Maximum Degree Publish-Subscribe Overlay Network Design*, Arizona State University, 2011.
- *A Jamming-Resistant MAC Protocol for Single-Hop Wireless Networks*, University of Southern California, October, 2010.
- *On Parameterized Minimum Degree Publish-Subscribe Overlay Network Design*, Federal University of Rio de Janeiro, Brazil, 2010.
- *An $O(\log n)$ Dominating Set Protocol for Wireless Ad-Hoc Networks under the Physical Interference Model*, Massachusetts Institute of Technology (MIT), 2009
- *An $O(\log n)$ Dominating Set Protocol for Wireless Ad-Hoc Networks under the Physical Interference Model*, University of Paderborn, Germany, 2009
- *A Jamming-Resistant MAC Protocol for Single-Hop Wireless Networks*, Federal University of Rio de Janeiro, Brazil, 2009.
- *A Jamming-Resistant MAC Protocol for Single-Hop Wireless Networks*, Texas A&M University, 2008.
- *Interference Models: Going Beyond the Unit-disk and Packet-Radio Models*, Federal University of Rio de Janeiro, Brazil, 2008.
- *Interference Models: Going Beyond the Unit-disk and Packet-Radio Models*, University of Arizona, 2007.
- *Beyond the Unit-disk and Packet Radio Models*, Dagstuhl Seminar 07151 Geometry in Sensor Networks, Schloss Dagstuhl , Germany , 2007
- *Beyond the Unit-disk and Packet Radio Models*, NSF Workshop on Geometric Approaches to Ad Hoc and Sensor Networks, University of California, Santa Barbara, 2006.
- *A Data Tracking Scheme for General Networks*. Informs Telecom'02, Boca Raton, FL, 2002.
- *A Data Tracking Scheme for General Networks*. Federal University of Rio de Janeiro, Brazil, 2001.
- *On Balls-and-bins with Deletions*. Federal University of Rio de Janeiro, Brazil, 2000.
- *Accessing Nearby Copies of Replicated Objects in a Distributed Environment*. INFORMS'00, San Antonio, TX, 2000.
- *Accessing Nearby Copies of Replicated Objects in a Distributed Environment*. Federal University of Rio de Janeiro, Brazil, 2000.
- *New Approximation Techniques for Some Ordering Problems*. Federal University of Rio de Janeiro, Rio de Janeiro, Brazil, 1998.
- *New Approximation Techniques for Some Ordering Problems*, Bell Labs/DIMACS (Center for Discrete Math. And Comp. Sci.), Murray Hill, NJ, 1998.
- *Accessing Nearby Copies of Replicated Objects in a Distributed Environment*, ASU, Tempe, AZ, 1998.
- *Accessing Nearby Copies of Replicated Objects in a Distributed Environment*, Los Alamos National Labs, Los Alamos, NM, 1998.
- *Accessing Nearby Copies of Replicated Objects in a Distributed Environment*, ASU/ACM student chapter, Tempe, AZ, 1998.
- *New Approximation Techniques for Some Ordering Problems*, University of Texas at Austin, Austin, TX, 1997.

C. GRANTS

(Unless otherwise indicated in the Co-PIs column, or if there are no other Co-PIs in the project, I am the lead PI on the respective project.)

i. AWARDED PROPOSALS

Total Awarded Funds: \$4,443,735.00

Total Individual Shares: \$1,615,735.50

Duration	Title	Sponsor	Award	Other Co-PIs	Individual Share
(2011-14)	Adversarial Models for Wireless Communication	National Science Foundation (NSF) -- Algorithmic Foundations (AF), and Office of International Science and Engineering (OISE)	\$379,392	(none)	100%
(2008-10)	Theory of Self-Stabilizing Overlay Networks	National Science Foundation (NSF) -- Theoretical Foundations (TF), and Office of International Science and Engineering (OISE)	\$170,163	(none)	100%
(2008-10)	Dynamic Routing, Distributed Hash Tables and Location Services	NSF-Theoretical Foundations (TF)	\$109,253	(none) (Goran Konjevod was a former co-PI, ASU)	100%
(2008-12)	Academic and Professional Development for Lower Division Computer Science, Engineering, and Mathematics Students: Transition to Upper Division, Research and the STEM Workforce	NSF – DUE	\$ 600,000	Armando Rodriguez (lead PI), Carlos Castillo-Chavez, Mary Anderson-Rowland (ASU)	5%
(2007-11)	Academic and Professional Development for Upper Division Computer Science, Engineering,	NSF - DUE	\$ 600,000	Armando Rodriguez (lead PI), Carlos Castillo-Chavez, Mary Anderson-	8%

	and Mathematics Students - II: Transition to Research, Graduate School, and the Workforce			Rowland (ASU)	
(2006-07)	LANL Internship: Efficient Shortest Path Computation In Planar Graphs	Los Alamos National Laboratories (LANL),	\$20,964	(none)	100%
(2006-10)	Academic and Professional Development for Upper Division Computer Science, Engineering, and Mathematics Students - II: Transition to Research, Graduate School, and the Workforce	NSF - DUE	\$ 500,000	Mary Anderson-Rowland (lead PI), Armando Rodriguez, Carlos Castillo-Chavez (ASU)	8%
(2004-05)	Multi-Application Partitioning System (Maps) - A Design Tool For Hardware/Software Partitioning Of Network Processor Systems	Consortium for Embedded Internetworking & Technologies (CEINT)	\$86,357	Arun Sen (lead PI, ASU)	50%
(2003-04)	A Case for an Inexpensive, Highly Available iSCSI Storage Solution	CEINT	\$85,357.00	Arun Sen (lead PI, ASU)	50%
(2003-04)	Hardware-Software Co-Design of Network Processors and Packet Classification	CEINT	\$81,357.00	Arun Sen (lead PI, ASU)	50%
(2003)	DIALM-POMC Workshop on Foundations of Mobile Computing	NSF	\$5,000.00	(none)	100%
(2003)	DIALM-POMC Workshop on Foundations of Mobile Computing	CEINT	\$3,000.00	(none)	100%
(2002-03)	Development of an iSCSI Storage Manager with Virtualization for eLinux on Intel 80321 I/O Processor	CEINT	\$77,032	Arun Sen (lead PI, ASU)	50%

(2001-03)	Computer Science, Engineering, and Mathematics Scholarship Program (for Freshmen and Sophomores),	NSF-DUE	\$270,000	Joaquin Bustoz (lead PI), Armando Rodriguez (ASU)	33%
(2001-02)	Packet Processing in a QoS Constrained Environment	CEINT	\$70,794	Arun Sen (lead PI, ASU)	50%
(2000-06)	CAREER: Accessing Shared Objects and Routing in Distributed Environments	NSF	\$273,598 (includes matching funds to industrial research grants)	(none)	100%
(2000-04)	Computer Science, Engineering, and Mathematics Scholarship Program (for Juniors and Seniors)	NSF-DUE	\$504,500	Joaquin Bustoz (lead PI), Armando Rodriguez, Barbara Gannod, James Turner (ASU)	20%
(1999-2003)	Parallel Elimination Orders with applications in Operations Research and Scientific Computing	NSF-DUE	\$200,000	Gary Miller, Bruce Maggs, R. Ravi (Carnegie Mellon U.)	25%
(1998-99)	FGIA: Accessing Shared Objects in a Distributed Environment	ASU	\$7,000	(none)	100%

ii. PENDING PROPOSALS

Duration	Title	Sponsor	Amount	Other Co-PIs	Individual Share
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D. STUDENT THESES AND DISSERTATIONS SUPERVISED

i. MASTER'S THESIS AWARDED

Student	Degree	Duration	Thesis Title	Employment after Graduation
Gayathri Vuppuluri	MS	(1999-2000)	A near-optimal data access scheme in a distributed environment	Compaq (now HP)
Srinivas Sardar	MCS	(1998-99)	Development of Multiport Load Balancing Tool for Distributed Networks	Compaq (now HP)
Anshul Dawra	MS	(1999-2001)	Most sustainable path routing	IBM
Soohyun Oh	MS	(1999-2001)	Finding most sustainable paths in networks with time-dependent edge reliabilities	PhD at ASU
Hai Huang	MS	(2000-03)	Approximation algorithms for the mobile piercing set problem with applications to Clustering in Ad-Hoc Networks	Intel
Shiva Sundararaman	MS	(2001-03)	Algorithm for flow allocation for multi-protocol label switching	Qualcom
James Higgins	MCS	(2004-06)	Location Service in Mobile Networks: An Overview	Intellitel
Rumana Islam	MCS	(2006-08)	Linear Programming Formulations for Minimizing Maximum Interference in Wireless Networks	MBA at ASU

ii. Ph.D. THESES AWARDED

Student	Degree	Duration	Thesis Title	Employment after Graduation
Soohyun Oh	PhD	(2001-05)	Collaborative prefetching frameworks of continuous media	Sungkyunkwan University, South Korea
Donglin Xia*	PhD	(2004-08)	Compact Routing Design in Networks of Low Doubling Dimension	Microsoft Research
Melih Onus	PhD	(2003-09)	Overlay Network Construction in Highly Decentralized Networks	Bilkent University, Turkey
Antonio Cardenas	PhD	(2004-10)	Detecting Sybil Nodes in Static and Dynamic Networks	Universidad Autonoma de Mexico, Mexicali, Mexico
Oleg Bakun	PhD	(2005-11)	Adaptive Decentralized Routing and Detection of Overlapping Communities	

* Donglin Xia received the *Best CSE PhD Student Award*, 2008.

iii. Ph.D. THESES IN PROGRESS

Student	Degree	Duration
Jin Zhang	PhD	(2008-present)
Xinhui Hu	PhD	(2010-present)
Chenyang Zhou	PhD	(2011-present)

I was also a member of several (over 100) MS and PhD thesis committees at ASU and other institutions.

PhD Thesis Examine: Mirjam Wattenhofer, *Distributed Coordination: Collecting, Locking, and Matching*, ETH Zurich, 2006.

E. PROFESSIONAL and SCIENTIFIC SERVICE

i. SCIENTIFIC and PROFESSIONAL SOCIETY MEMBERSHIPS

- Association of Computer Machinery (ACM)
- IEEE Computer Society

ii. EDITORSHIPS

- **Associate Editor**, Ad-Hoc Networks, Springer-Verlag (2010-present).
- **Guest Editor**, ACM Baltzer Journal on Mobile Networks and Applications (MONET) Special Issue on "Foundations of Mobile Computing", 11(2), 2006.
- **Guest Editor**, IEEE JSAC (Journal on Selected Areas of Communication) Special Issue on "Network Science for Communication Networks", to appear.
- **Guest Editor**, Ad-Hoc Networks (Springer-Verlag) Special Issue on "Algorithms for Ad-Hoc and Sensor Networks", to appear.
- **Guest Editor**, ACM Transactions on Algorithms, Invited papers from ACM SODA'12, to appear.
- Proceedings of ACM **DIALM-POMC** Joint Workshop on Foundations of Mobile Computing, 2003.
- Proceedings of First IEEE Workshop on Network Science for Communication Networks (**NetSciCom**), 2009
- Proceedings of ACM **DIALM-POMC** Joint Workshop on Foundations of Mobile Computing, 2010.
- Proceedings of First IEEE Workshop on Network Science for Communication Networks (**NetSciCom**), 2010
- Proceedings of the 29th Annual ACM Symposium on Principles of Distributed Computing (**PODC**), 2010
- Network Science for Communication Networks, Springer Verlag, to appear.

iii. CONFERENCE ACTIVITIES

Program Chair

- Thirteenth International Symposium on Stabilization, Safety, and Security of Distributed (**SSS**), 2012
- ACM DIALM-POMC Joint Workshop on Foundations of Mobile Computing (**DIALM-POMC**), 2010
- Second IEEE Workshop on Network Science for Communication Networks (**NetSciCom**), 2010
- First IEEE Workshop on Network Science for Communication Networks (**NetSciCom**), 2009
- ACM DIALM-POMC Joint Workshop on Foundations of Mobile Computing (**DIALM-POMC**), 2003

General Chair

- Third IEEE Workshop on Network Science for Communication Networks (**NetSciCom**), 2011

- ACM SIGACT-SIGOPS Symposium on Principles of Distributed Computing (**PODC**), 2010
- First Arizona Workshop on Algorithms, Arizona State University, 2001.

Founder

- IEEE Workshop on Network Science for Communication Networks (**NetSciCom**), held in conjunction with IEEE INFOCOM.

Steering Committee Chair

- IEEE Workshop on Network Science for Communication Networks (**NetSciCom**), 2011--present

Steering Committee Member

- ACM Workshop on Foundations of Mobile Computing (**FOMC**; formerly known as **DIALM-POMC**), 2010—present.
- ACM SIGACT-SIGOPS Symposium on Principles of Distributed Computing (**PODC**), 2008-2011

Treasurer

- ACM SIGACT-SIGOPS Symposium on Principles of Distributed Computing (**PODC**), 2009

Publicity chair

- ACM Symposium on Parallelism in Algorithms and Architectures (**SPAA**), 2007 – present

Program Committee Member

- Twelfth ACM Symposium on Parallelism in Algorithms and Architectures (**SPAA**), 2000
- Fourth ACM International Workshop on Discrete Algorithms and Methods for Mobile Computing and Communications (**DIAL-M**), 2000
- Fifth ACM International Workshop on Discrete Algorithms and Methods for Mobile Computing and Communications (**DIAL-M**), 2001
- IEEE International Conference on High Performance Computing (**Hi-PC**), 2001
- Fourth ACM International Workshop on Discrete Algorithms and Methods for Mobile Computing and Communications (**DIAL-M**), 2002
- Latin American Theoretical Informatics (**LATIN**), 2004
- The 4th International Conference on Collaborative Computing: Networking, Applications and Worksharing (**CollaborateCom**), 2005
- 7th Intl. Symposium on Modeling and Optimization in Mobile, Ad Hoc, and Wireless Networks (**WiOpt**), 2005
- The 6th ACM International Symposium on Mobile Ad Hoc Networking and Computing (**MobiHoc**), 2005
- The 5th International Conference on Collaborative Computing: Networking, Applications and Worksharing (**CollaborateCom**), 2006
- IEEE International Workshop on Foundations and Algorithms for Wireless Networking (**FAWN**), 2006
- IEEE International Conference on Distributed Computing in Sensor Systems (**DCOSS**), 2006
- IEEE International Conference on Distributed Computing in Sensor Systems (**DCOSS**), 2007

- Fourth International Conference on fun with Algorithms (**FUN**), 2007
- ACM DIALM-POMC Joint Workshop on Foundations of Mobile Computing (**DIALM-POMC**), 2007
- ACM DIALM-POMC Joint Workshop on Foundations of Mobile Computing (**DIALM-POMC**), 2008
- Latin American Theoretical Informatics (**LATIN**), 2008
- ACM-SIAM Symposium on Discrete Algorithms (**SODA**), 2008
- International Workshop on Algorithmic Aspects of Wireless Sensor Networks (**ALGOSENSORS**), 2008
- IEEE International Parallel & Distributed Processing Symposium (**IPDPS**), 2009
- Twenty-Eighth Annual ACM SIGACT-SIGOPS Symposium on Principles of Distributed Computing (**PODC**), 2009
- International Symposium on Distributed Computing (**DISC**), 2010.
- Twelfth International Symposium on Stabilization, Safety, and Security of Distributed (**SSS**), 2011
- Twenty-third ACM Symposium on Parallelism in Algorithms and Architectures (**SPAA**), 2011
- Thirty-first IEEE International Conference on Distributed Computing Systems (**ICDCS**), 2011
- Thirty-first IEEE International Conference on Distributed Computing Systems (**ICDCS**), 2012
- IEEE International Conference on Distributed Computing in Sensor Systems (**DCOSS**), 2012
- Latin American Theoretical Informatics (**LATIN**), 2012
- ACM-SIAM Symposium on Discrete Algorithms (**SODA**), 2012

iv. CONFERENCE, JOURNAL, and RESEARCH PROPOSAL REVIEWER

- Served as reviewer for several journals, including
 - SIAM Journal on Computing,
 - Journal of the ACM
 - IEEE Transactions on Mobile Computing
 - IEEE Transactions on Networking
 - Combinatorica,
 - Algorithmica,
 - IEEE Transactions on Computers, and
 - Theoretical Computer Science.
- Served as reviewer for several conferences, including
 - ACM-SIAM Symposium on Discrete Algorithms (SODA),
 - ACM Symposium on Theory of Computing (STOC),
 - IEEE Foundations of Computer Science (FOCS),
 - ACM Symposium on Principles of Distributed Computing (PODC)
 - ACM Symposium on Parallelism in Algorithms and Architectures (SPAA),

- ACM DIALM-POMC Joint Workshop on Foundations of Mobile Computing (DIALM-POMC),
 - ACM International Symposium on Mobile Ad-Hoc Networking and Computing (MobiHoc), and
 - IEEE INFOCOM
- Served as reviewer for several research grant proposals, including
 - NSF
 - Swiss National Science Foundation.

F. UNIVERSITY COMMITTEE SERVICE

University

(2002-03) Clube Brasil (Brazilian Student Association), Faculty advisor

College

(2005-07) IAFSE Committee of Review

(2001-02) Self-Study Committee for CSE

(2000-01) CSE Chair Search Committee

Department

(2010-11) CSE-SCIDSE Graduate Program Committee

(2007) CSE Personnel Committee

(2006-07) CSE ABET Committee

(2004-06) CSE Graduate Program Committee

(2004-05) CSE Faculty meeting secretary

(2003-04) CSE Space Committee

(2003-04) CSE Faculty Recruiting Committee

(2003) CSE Brickyard Move Committee

(2001-present) CSE 310 Course Coordinator

(2001-present) Technical Area Algorithms and Theory Committee Chair

(2000-02) CSE Graduate Program Committee

(1999-2001) CSE Initial Graduate Student Advisor

(1999-2000) CSE Colloquium Series

(2000-01) Chair of CSE Colloquium Series

(1998-99) CSE TA and Financial Aid Committee

(1998-2000) CSE Graduate Admissions Committee

Coordinator: Creation and development of an Algorithms group and research area at the CSE Department (now SCIDSE), ASU

G. HONORS and AWARDS

(May 00 – May 06) NSF CAREER Award.

(Aug 92 – June 98) Graduate Research Scholarship, Carnegie Mellon University.

(March 89 – Feb 92) Graduate Research Assistanship, CAPES, Brazil.

H. TEACHING RECORD

i. LIST of COURSES

Undergraduate

ASU 101 The ASU Experience

CSE 450 Design and Analysis of Algorithms

CSE 310 Data Structures and Algorithms

Graduate

CSE 552 Randomized and Approximation Algorithms

CSE 550 Combinatorial Optimization and Intractability

CSE 598 Design and Analysis of Algorithms

CSE 591A Algorithms for Distributed and Parallel Networks

CSE 591 Theory of Dynamic Communication Networks

ii. NEW COURSE and COURSE MATERIAL DEVELOPED

New Courses Developed

Graduate

CSE 591, Theory of Dynamic Communication Networks, Spring 2010

- This course explores the theoretical foundations of dynamic networks. The course addresses two of the foremost scenarios of recent fundamental research in this area: wireless ad-hoc networks, and overlay-based peer-to-peer distributed systems, with the main focus being on wireless ad-hoc networks. The course considers overlay network design and maintenance, topology control, routing primitives (such as point-to-point routing, broadcasting), node location services and distributed hash tables, self-stabilization, synchronization (more in the context of wireless networks), and more. It also addresses the fundamental yet still evolving problem of how to provide a suitable model of wireless communication for algorithm design. This is a theoretical course that focus on algorithms with provable properties of correctness, complexity and/or optimality. Students need to have taken CSE 450/598 or CSE 550 or CSE 552 before taking this course. A background in distributed systems or networking would be helpful, but is not essential. This course explores more *current* topics in the area of distributed algorithms than the more classical CSE591A course described below. I have a very rewarding experience teaching this course for the first time in Spring 2010, as my student evaluations show (see Summary of Teaching). More details (class syllabus, slides/notes, assignments, etc.) on this course can be found in the Course Folders.

CSE 591A, Algorithms for Distributed and Parallel Networks, Spring 1999

- This course is intended to provide a theoretical background in classical algorithms for distributed and parallel networks — by addressing fundamental problems in this area, and developing a set of basic

concepts and techniques in distributed algorithmic design (in both synchronous and asynchronous scenarios) — and to be a theoretical complement to the more applied networking courses at our department. I had a very rewarding experience teaching this course, getting very positive feedback from the students in my teaching evaluation forms. The introduction of this course also introduced several graduate students in the department to research in the area of design and analysis of network algorithms.

I have been the coordinator of the re-structuring of the courses in foundations of computer science at ASU. I have introduced many changes to the existing courses syllabuses, from the most basic undergraduate algorithms courses to the most advanced courses in Theory of Computing, also eliminating a large amount of overlap among the topics covered by the courses. Namely, together with other professors at SCIDSE, I revised the contents of the courses CSE 205, CSE 310, CSE 450/598, CSE 550, and to some extent (in order to be compatible with the other revised courses) CSE 555. I have introduced two new courses in network algorithms in Spring 1999 and Spring 2010. Together with Prof. Konjevod, we decided to introduce a new course in randomized and approximation algorithms, which is now a regular graduate course CSE 552 Randomized and Approximation Algorithms (this course was previously offered by Prof. Konjevod; with his departure from ASU I will be teaching this course in the future). CSE 552 and the CSE 591s courses I developed will be continued to be offered on a yearly basis, on the semesters when CSE 550 is not offered, thus providing a sequence of four graduate courses in Algorithms. I intend to also convert CSE591 Theory of Dynamic Communication Networks into a regular course in the future (the CSE 591 category is for Special Topics, new courses not yet offered on a regular basis).

More specifically, I mention below some of the changes I introduced in the Algorithms area at ASU. The current Algorithms courses offered by the department are: CSE 310 – Data Structures and Algorithms (undergraduate); CSE 450/598 – Design and Analysis of Algorithms (advanced undergraduate/graduate); CSE 550 – Combinatorial Algorithms and Intractability (graduate); CSE 552 – Randomized and Approximation Algorithms; and the seminar courses CSE 591 – Algorithms for Distributed and Parallel Networks (graduate), and CSE 591 – Theory of Dynamic Communication Networks (graduate).

Re-structuring of CSE 310 Data Structures and Algorithms

- Changed the textbook for this course in Fall 1998, to a more formal algorithm/data structure design and analysis oriented textbook, which is still currently in use for this course. Completely redesigned the focus of the course to a more abstract view of algorithms and data structures, so that all CS/CSE students at ASU have a better understanding of key algorithmic/data structure concepts, independent of the particular implementation of such, which

Re-structuring of CSE 450/598 Design and Analysis of Algorithms

- I revised the syllabus of CSE 450 (which is co-listed as a graduate course, CSE 598), in order to provide a more up-to-date view of the topics in this course, and also in order to better “place” this course in the sequence of graduate courses in Algorithms, reducing a previous significant overlap with other courses and ensuring that the most important concepts in classical algorithms are covered in full.

Re-structuring of CSE 550 Combinatorial Algorithms and Intractability

- Many changes have also been introduced in the syllabus of CSE 550, Combinatorial Algorithms and Intractability. These changes (including change of textbooks) have been introduced again in order to provide a more up-to-date view of the topics in this course, and also in order to better “place” this course in the sequence of graduate courses in Algorithms (i.e., to reduce overlap with CSE 450/598 and CSE 555, and to make sure that the foundations of Combinatorial Algorithms were covered in this course). I have had a very pleasant experience teaching this course at ASU, as the student evaluations (Fall 2000, Fall 2001, and current) show. I focus on high individual student interaction when teaching this course, and on many group activities, in order to enhance student learning.

Web based and other innovative techniques.

- I extensively use Web techniques in all of my courses (even prior to Blackboard at ASU). I developed new sets of slides for each of the courses I teach, which are made available online to the students. I got very positive feedback from the students with respect to my online course material. I make extensive use of course electronic newsgroups for forum discussions and course announcements.

iii. UNDERGRADUATE PROJECTS SUPERVISED

(a) Undergraduate Thesis (ASU Barrett Honors College)

Student	Duration	Project Title
Christopher Fulton Shiflet	(2001-02)	Analysis of Mobility Models in Mobile Ad-Hoc Networks

(b) Undergraduate Research

ASU Fulton Undergraduate Research Initiative (FURI)

Student	Duration	Project Title
Jennifer Harrison	2008	Sensor Clock Synchronization Problem with Applications in Rainforest Monitoring
Phillip Stevens	(2010-present)	Dynamic De Bruijn Graph

NSF Research Experience for Undergraduates (REU)

Student	Duration	Project Title
Phillip Stevens	(2010-11)	Theory of Self-Stabilizing Overlay Networks*
Jadiel de Armas	(2011)	Theory of Self-Stabilizing Overlay Networks*

* This project is supplemental to my NSF project of the same title.

(c) Honors Projects (ASU Barrett Honors College), Footnote 18

Student	Date	Course	Project Title
Beatris Rusu	Fall 2009	CSE310	Network Flows
Michael Fruchtman	Spring 2009	CSE450	--

Travis Portz	Spring 2009	CSE450	--
Shawn O'Rourke	Fall 2007	CSE310	B-trees
Jason Siciliano	Fall 2002	CSE310	Notes on Number-Theoretic Algorithms
Komal Chhibber	Spring 2001	CSE310	Splay Trees
Peter Neubauer	Fall 1999	CSE310	B-Trees: Balanced Tree Data Structures
Lee Genz	Fall 1998	CSE310	2-3 Trees

I. OUTREACH ACTIVITIES

- Collaboration with Industry: Four research grants with the Consortium for Embedded Internetworking and Technologies (CEINT), whose members at the time were Motorola, Intel and ASU. Through these grants, I have had the opportunity of invaluable direct interaction with industry. Our students have also greatly benefited from this interaction, not only through our research projects directly, but also by finding job opportunities at Intel and Motorola (Freescale) after their graduation, by joining internship programs at these companies, and by receiving scholarships for their graduate studies (e.g., Tushar Gohad received a Motorola Scholarship, awarded under Motorola's 2003/2004 University Partnership in Research program).
- Encourage more female students to pursue or further continue their studies in Computer Science.
- Enhance diversity at ASU through my six NSF funded educational undergraduate Computer Science, Engineering, and Mathematics Scholarship (CSEMS) and Science, Technology, Engineering and Mathematics (STEM) programs at ASU.
- International Collaboration with University of Paderborn/Technical U. of Munich, Germany, two of the top institutions in distributed computing/network algorithms in Germany: My international collaboration with Prof. Christian Scheideler, now at the U. of Paderborn, has not only resulted in high impact research publications, but is also a component in my NSF funded "Theory of Self-stabilizing Overlay Networks" grant; I am a potential graduate mentor for students in the international graduate school under planning at the U. of Paderborn, Germany.

Please refer to my Candidate's Statement for a more detailed description of these activities.