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CURRICULUM VITAE

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CAREER OBJECTIVE: To lead cutting-edge research in network algorithms with intensive international collaboration, involving students from undergraduate to PhD level, with follow through to real-world applications.

A. BACKGROUND

i. EDUCATION

(Aug 92 – June 98)	Carnegie Mellon University	(Pittsburgh, Pensylvannia)

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, Pensylvannia)

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 16 – present)   Full Professor, Computer Science and Engineering (CSE),
School of Computing, Informatics, and Decision Systems Engineering (CIDSE),
Arizona State University (ASU)   (Tempe, Arizona)

(Aug 98 – present)   Barrett Honors Faculty, Barrett Honors College, ASU   (Tempe, Arizona)

(Aug 04 – Jul 16)[1]   Associate Professor, tenured, Computer Science and Engineering (CSE),
School of Computing, Informatics, and Decision Systems Engineering (CIDSE),
Arizona State University (ASU)   (Tempe, Arizona)

(Aug 98 – July 04)   Assistant Professor, CSE Department, ASU   (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, Pensylvannia)

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[1] Family/maternity leaves: 50%FTE during 08/2005-12/2007 and 01-05/2011, and 25%FTE during 08/2004-05/2005.

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;
Self-stabilizing and self-organizing systems;
Biologically-inspired algorithms

B. PUBLICATIONS

Most of my publications (including most recent ones) can be found at

http://dblp.uni-trier.de/pers/hd/r/Richa:Andr=eacute=a_W=

For my citation count and impact of my publications, please check

http://scholar.google.com/citations?hl=en&user=1LUuMc8AAAAJ

In particular my h-index is 25 and I have received over 1100 citations since 2011 (my total number of citations is 3001).

In the Algorithms/Theory of Computing publications below, the list of authors *always 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*. **Conferences in Computer Science** are *fully reviewed* and often *more competitive* and with a *higher impact factor* than the CS journals. Whenever available, I indicated the *acceptance rates* for *full papers* at the respective conferences.

i. REFEREED ARCHIVAL JOURNAL PAPERS

1. G. Konjevod, A. Richa, **D. Xia**. Scale-Free Compact Routing Schemes in Networks of Low Doubling Dimension. *ACM Transactions on Algorithms (TALG)*, 12 (3), 2016

2. **Zahra Derakhshandeh, Robert Gmyr**, Andréa W. Richa, Christian Scheideler, **Thim Strothmann**. Universal Coating for Programmable Matter. To appear in *Theoretical Computer Science (TCS)*.

3. Melih Onus and Andréa W. Richa. Parameterized Minimum Degree Publish-Subscribe Overlay Network Design. *Communications Networks*, 94: 307-317 (2016).

4. Andréa W. Richa, Christian Scheideler. Jamming-Resistant MAC Protocols for Wireless Networks. *Encyclopedia of Algorithms*, pages 999-1002, 2016.

5. **Nadi Ilker Bozkurt**, Hai Huang, Bruce Maggs, Andrea Richa, Maverick Woo. Mutual Embeddings. *Journal of Interconnection Networks (JOIN),* 15(1-2), 2015.

6. Riko Jacob, Andrea Richa, Christian Scheideler, Stefan Schmid, and **Hanjo Täubig**. A Polylogarithmic Time Construction for Distributed Self-Stabilizing Skip Graphs. *Journal of the ACM (JACM)*, Volume 61 Issue 6, Article no. 36 (pages 36:1-36:265, November 2014.

7. Andrea Richa and Christian Scheideler. Adversarial Models for Wireless Communication. *Encyclopedia of Algorithms*, pages 1-5, Dec 2014.

8. Baruch Awerbuch, Andréa Richa, Christian Scheideler, Stefan Schmid, **Jin Zhang**. Principles of Robust Medium Access and an Application to Leader Election. *ACM Transactions on Algorithms*, 10(4): 24 (2014)

9. Mauro M. Coutinho, Alon Efrat, Thienne Johnson, Andrea Richa and **Mengxue Liu**. Healthcare Supported by Data Mule Networks in Remote Communities of the Amazon Region. *International Scholarly Research Notices*, vol. 2014, Article ID 730760, 2014.

10. **Dominik Gall**, Riko Jacob, Andrea Richa, Christian Scheideler, Stefan Schmid, and **Hanjo Taeubig**. A Note on the Parallel Runtime of Self-Stabilizing Graph Linearization. *Theory of Computing Systems* 55(1): 110-135, 2014.

11. Andréa W. Richa, Stefan Schmid, Christian Scheideler, and **Jin Zhang**. Competitive throughput in multi-hop wireless networks despite adaptive jamming. *Distributed Computing* 26(3): 159-171 (2013)

12. Andrea Richa, Christian Scheideler, Stefan Schmid, **Jin Zhang**. An Efficient and Fair MAC Protocol Robust to Reactive Interference. *IEEE/ACM Transactions on Networking* 21(3): 760-771 (2013)

13. **Dejun Yang**, Guoliang Xue, **Jin Zhang**, Andréa W. Richa, Xi Fang: Coping with a Smart Jammer in Wireless Networks: A Stackelberg Game Approach. *IEEE Transactions on Wireless Communications* 12(8): 4038-4047 (2013)

14. Melih Onus and Andréa W. Richa. Minimum Degree Publish-Subscribe Overlay Network Design. *IEEE Transactions on Networking*, volume 19(5), pages 1331-1343, 2011.

15. **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.

16. **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.

17. **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.

18. **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.

19. **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.

20. **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).

21. **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.

22. 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.

23. **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.

24. 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).

25. F. T. Leighton, B. M. Maggs, and **A. W. Richa**. Fast Algorithms for Finding O(Congestion + Dilation) Packet Routing Schedules, *Combinatorica*, 19(2):1--27, 1999.

26. 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)

27. B. Ghosh, F. T. Leighton, B. M. Maggs, S. Muthukrishan, 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

1. **Sarah Cannon, Joshua J. Daymude**, Dana Randall, Andréa W. Richa. A Markov Chain Algorithm for Compression in Self-Organizing Particle Systems. To appear in Proceedings of *ACM Symposium on Principles of Distributed Computing (PODC),* 2016.

2. **Zahra Derakhshandeh**, **Robert Gmyr, Alexandra Porter**, Andréa W. Richa, Christian Scheideler, **Thim Strothmann**. On the Runtime of Universal Coating for Programmable Matter. To appear in *Proceedings of 22nd^t International Conference on DNA and Molecular Computing (DNA22)*, 2016.

3. **Zahra Derakhshandeh, Robert Gmyr**, Andréa W. Richa, Christian Scheideler, **Thim Strothman**. Universal Shape Formation for Programmable Matter. To appear in *Proceedings of ACM Symposium on Parallelism in Algorithms and Architecture (SPAA),* 2016.

4. **Mengxue Liu, Rachit Agarwal,** Andrea Richa, Thienne Johnson, Alon Efrat, and Mauro M. Coutinho. Robust Data Mule Networks with Remote Healthcare Applications in the Amazon Region: A Fountain Code Approach. To appear in *ACM HealthCom'15*. (Acceptance rate: ~30%)

5. **Zahra Derakhshandeh, Robert Gmyr, Thim Strothmann**, Andrea W. Richa, Christian Scheideler, and Rida Bazzi. Leader Election and Shape Formation with Self-Organizing Programmable Matter. In *Proceedings of 21st International Conference on DNA and Molecular Computing (DNA21)*, pages 117-132, 2015

6. **Zahra Derakhshandeh, Robert Gmyr, Thim Strothmann**, Andrea W. Richa, and Christian Scheideler. Work-in-progress: An Algorithmic Framework for Shape Formation Problems in Self-Organizing Particle Systems. In *Proceedings of 2nd ACM International Conference on Nanoscale Computing and Communication (NANOCOM),* 2015.

7. **Xinhui Hu, Arne Ludwig**, Andréa W. Richa, Stefan Schmid. Competitive Strategies for Online Cloud Resource Allocation with Discounts: The 2-Dimensional Parking Permit Problem. To appear in Proceedings of *IEEE International Conference on Distributed Computing Systems (ICDCS)*, 2015. (Acceptance rate: ~15%)

8. **Zahra Derakhshandeh, Robert Gmyr, Thim Strothmann**, Rida Bazzi, Andrea Richa and Christian Scheideler. Brief Announcement: On the Feasibility of Leader Election and Shape Formation with Self-Organizing Programmable Matter. To appear in *Proceedings of ACM Symposium on Principles of Distributed Computing (PODC)*, 2015*,*

9. **Chenyang Zhou, Anisha Mazumder**, Arunabha Sen, Martin Reisslein, Andrea Richa. On Shortest Single/Multiple Path Computation Problems in Fiber-Wireless (FiWi) Access Networks. In *Proceedings of the IEEE 15th International Conference on High Performance Switching and Routing (IEEE HPSR), pages 131-137, 2014.*

10. **Adrian Ogierman**, Andréa W. Richa, Christian Scheideler, Stefan Schmid, **Jin Zhang**: Competitive MAC under adversarial SINR. In *Proceedings of the IEEE 33rd Conference on Computer Communications (INFOCOM)*, pages 2751-2759, 2014 (Acceptance rate: 19%)

11. **Zahra Derakhshandeh**, Shlomi Dolev, **Robert Gmyr**, Andréa W. Richa, Christian Scheideler, **Thim Strothmann**: Brief announcement: AMOEBOT - a new model for programmable matter. In *Proceedings of the ACM Symposium on Parallelism in Algorithms and Architectures (SPAA),* pages 220-222, 2014.

12. Andres Mora, **David Ganger, Greg Wells, Jin Zhang, Xinhui Hu, Chenyang Zhou**, Andrea Richa, Cody Youngbull. Ad-Hoc multihop underwater optical network for deep ocean monitoring. In

Proceedings of MTS\IEEE OCEANS, pages 1-5, 2013.

13. **Xinhui Hu**, Stefan Schmid, Andréa W. Richa, Anja Feldmann: Optimal Migration Contracts in Virtual Networks: Pay-as-You-Come vs Pay-as-You-Go Pricing. In *Proceedings of IEEE ICDCN*, pages 285-299, 2013.

14. **Dejun Yang, Jin Zhang, Xi Fang**, Andréa W. Richa, Guoliang Xue: Optimal transmission power control in the presence of a smart jammer. In *Proceedings of IEEE GLOBECOM*, pages 5506-5511, 2012.

15. Andréa W. Richa, Christian Scheideler, Stefan Schmid, **Jin Zhang**: Competitive and fair throughput for co-existing networks under adversarial interference. In *Proceedings of the ACM Symposium on Principles of Distributed Computing (PODC)*, pages 291-300, 2012.

16. 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.

17. 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%.)

18. 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.

19. 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.

20. 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.

21. Andrea Richa, Christian Scheideler, Stefan Schmid, and **Jin Zhang**. Towards Jamming-Resistant and Competitive Medium Access in the SINR Model. In *Proceedings of the Third Annual ACM s3 Workshop*, Las Vegas, Nevada, USA, September 2010.

22. 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%)

23. 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.

24. 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%)

25. **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.

26. **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%)

27. 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%.

28. **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.

29. **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.

30. 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%.

31. 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.

32. 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.

33. 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.

34. 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%.

35. 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%.

36. **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.

37. 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%.

38. **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.

39. **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.

40. **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.

41. **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.

42. **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.

43. 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.

44. **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.

45. 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.

46. 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.

47. 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.

48. 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.

49. 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.

50. 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.

51. 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.

52. 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.

53. 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.

54. B. Ghosh, F. T. Leighton, B. M. Maggs, S. Muthukrishan, 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

1. Andréa W. Richa, Christian Scheideler (Eds.): Stabilization, Safety, and Security of Distributed Systems - 14th International Symposium, SSS 2012, Toronto, Canada, October 1-4, 2012. Proceedings. Lecture Notes in Computer Science 7596, Springer 2012, ISBN 978-3-642-33535-8

2. Andréa W. Richa, Thomas Moscibroda (Eds.): Ad Hoc Networks Special Issue on Algorithmic Aspects of Ad Hoc Networks. Ad Hoc Networks, 2012.

3. Andréa W. Richa, Thomas Moscibroda (Eds.): Proceedings of the DIALM-POMC Joint Workshop on Foundations of Mobile Computing, Cambridge, Massachusetts, USA, September 16, 2010. ACM 2010, ISBN 978-1-4503-0413-9

4. Andréa W. Richa, Rachid Guerraoui (Eds.): Proceedings of the 29th Annual ACM Symposium on Principles of Distributed Computing, PODC 2010, Zurich, Switzerland, July 25-28, 2010. ACM 2010, ISBN 978-1-60558-888-9Proceedings of the 29th Annual ACM Symposium on Principles of Distributed Computing (PODC), 2010

5. Andréa W. Richa, Arunabha Sen, Katia Obraczka (Eds.). Proceedings of Second IEEE Workshop on Network Science for Communication Networks (NetSciCom), 2010

6. Andréa W. Richa, Arunhaba Sen, Katia Obraczka (Eds.). Proceedings of First IEEE Workshop on Network Science for Communication Networks (NetSciCom), 2009

7. Andréa W. Richa, Jennifer L. Welch (Eds.): MONET Special Issue on Foundations of Mobile Computing. MONET 11(2), 2006

8. Andréa W. Richa, Jennifer Welch (Eds.). Proceedings of ACM DIALM-POMC Joint Workshop on Foundations of Mobile Computing (DIALM-POMC), 2003.

(b) Book Chapters

9. 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.

10. 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
Papers under revision/submission

- **Zahra Derakhshandeh, Robert Gmyr, Thim Strothmann**, Andrea W. Richa, Christian Scheideler, and Rida Bazzi. Leader Election and Shape Formation with Self-Organizing Programmable Matter. Invited submission to journal Natural Computing, Special Issue DNA21.

Selected Technical Reports (Recent, 2008-15)

- **Zahra Derakhshandeh, Robert Gmyr,** Andréa W. Richa, Christian Scheideler, **Thim Strothmann**, Shimrit Tzur-David: Infinite Object Coating in the Amoebot Model. CoRR abs/1411.2356 (2014)

- Shlomi Dolev, **Robert Gmyr**, Andréa W. Richa, Christian Scheideler: Amoeba-inspired Self-organizing Particle Systems. CoRR abs/1307.4259 (2013).

- **Adrian Ogierman**, Andréa W. Richa, Christian Scheideler, Stefan Schmid, Jin Zhang: Competitive MAC under Adversarial SINR. CoRR abs/1307.7231 (2013)

- 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

- **Keynote Speaker,** *Adversarial Models for Wireless Communication,* 20th International Conference on AD-HOC Networks & Wireless (**SIROCCO**), 2013.

- **Biomimicry Center at ASU Launch Event, invited speaker,** *Smart Matter,* ASU, March 2015.

- **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,** *Self-organizing Particle Systems,* 16th International Symposium on Stabilization, Safety, and Security of Distributed Systems (**SSS**), 2014.

- **Tutorial** *Algorithmic Foundations of Ad Hoc Networks,* MICS Summer School, ETH Zurich, June 30 – July 04, 2004.

- *Programmable Matter: Models and Problems,* CS Colloquium, University of Victoria, Victoria, Canada, Fall 2015.

- *Programmable Matter: Models and Problems,* CS Faculty Series, CIDSE, ASU, March 2015.

- *Programmable Matter: Models and Problems,* Discrete Math Seminar, ASU, March 2015.

- *Algorithmic Foundation of Self-organizing Particle Systems and of Wireless Communication,* University of South Florida, March 2015.

- *Programmable Matter: Models and Problems,* Sch. of Math. and Natural Sci., ASU West, March 2015.

- *Programmable Matter: Models and Problems,* Math Club, ASU, November 2014.

- *Programmable Matter: Models and Problems, 2nd* Biological Distributed Algorithms (**BDA**) Workshop, co-located with DISC'14, Austin, Texas, October 2014.

- *Amoeba-Inspired Self-Organizing Particle Systems,* NSF Workshop on Self-organizing Particle Systems, co-located with ACM-SIAM SODA'14, Portland, Oregon, January 2014.

- *Adversarial Models for Wireless Communication,* University of Paderborn, Germany, 2013.

- *Adversarial Models for Wireless Communication,* Telekom Networking Lecture Series Workshop, Technical University of Berlin, Germany, July 2011.

- *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

i. AWARDED PROPOSALS

Total Awarded Funds: $5,429,767.00
Total Individual Shares: $2,456,718.50 (~$1.1M awarded in 2011-16)

Duration	Title	Sponsor	Award	PIs	Individual Share
(2016-18)	A Distributed and Stochastic Algorithmic Framework for Active Matter	National Science Foundation (NSF) – Algorithms in the Field (AiTF)	$300,000	A. Richa (lead PI), D. Randall and D. Goldman (Georgia Tech)	33%
(2014-17)	Self-organizing Particle Systems	National Science Foundation (NSF) – Algorithmic Foundation (AF)	$450,000	A. Richa (lead PI)	100%
(2013-15)	EAGERL Self-organizing Particle Systems: Models and Algorithms	National Science Foundation (NSF) – Algorithmic Foundation (AF)	$176,000	A. Richa (lead PI)	100%
(2012)	SSS'12 Travel Scholarships	National Science Foundation (NSF)	$10,000	A. Richa (lead PI)	100%
(2011-14)	Adversarial Models for Wireless Communication	NSF –Algorithmic Foundations (AF), and Office of Int. Sci. and Eng. (OISE)	$379,392	A. Richa (lead PI)	100%
(2008-12)	Theory of Self-Stabilizing Overlay Networks	NSF--Theoretical Foundations (TF) and OISE	$170,163	A. Richa (lead PI)	100%
(2008-11)	Dynamic Routing, Distributed Hash Tables and Location Services	NSF-TF	$109,253	A. Richa (lead PI) (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), A. Richa, Carlos Castillo-Chavez, Mary Anderson-Rowland (ASU)	13%

(2007-11)	Academic and Professional Development for Upper Division CS, Eng., and Math. Students - II: Transition to Research, Graduate School, and the Workforce	NSF - DUE	$ 600,000	Armando Rodriguez (lead PI), A. Richa, Carlos Castillo-Chavez, Mary Anderson-Rowland (ASU)	8%
(2006-07)	LANL Internship: Efficient Shortest Path Computation In Planar Graphs	Los Alamos National Laboratories (LANL),	$20,964	A. Richa (lead PI)	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), A. Richa, 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), A. Richa	50%
(2004-06)	Academic And Professional Development For Computer Science; Engineering; And Mathematics Students: Transitioning To Upper Division; Research; Grad...	NSF-DUE	$450,000	Joaquin Bustoz (lead PI), A. Richa, Armando Rodriguez (ASU)	33%
(2003-04)	A Case for an Inexpensive, Highly Available iSCSI Storage Solution	CEINT	$85,357.00	Arun Sen (lead PI, ASU), A. Richa	50%
(2003-04)	Hardware-Software Co-Design of Network Processors and Packet Classification	CEINT	$81,357.00	Arun Sen (lead PI, ASU), A. Richa	50%

(2003)	DIALM-POMC Workshop on Foundations of Mobile Computing	NSF	$5,000.00	A. Richa (lead PI)	100%
(2003)	DIALM-POMC Workshop on Foundations of Mobile Computing	CEINT	$3,000.00	A. Richa (lead PI)	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), A. Richa	50%
(2001-03)	Computer Science, Engineering, and Mathematics Scholarship Program (for Freshmen and Sophomores),	NSF-DUE	$270,000	Joaquin Bustoz (lead PI), A. Richa, Armando Rodriguez (ASU)	33%
(2001-02)	Packet Processing in a QoS Constrained Environment	CEINT	$70,794	Arun Sen (lead PI, ASU), A. Richa	50%
(2000-06)	**CAREER:** Accessing Shared Objects and Routing in Distributed Environments	NSF	$273,598 (includes matching funds)	A. Richa (lead PI)	100%
(2000-04)	Computer Science, Engineering, and Mathematics Scholarship Program (for Juniors and Seniors)	NSF-DUE	$504,500	Joaquin Bustoz (lead PI), A. Richa, 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.), A. Richa (ASU)	25%
(1998-99)	FGIA: Accessing Shared Objects in a Distributed Environment	ASU	$7,000	A. Richa (lead PI)	100%

ii. OTHER PROJECTS in PROGRESS (see Section K)

- *A data mule network focused on Amazon riverine population with e-health applications (CoDPON):*

http://www.margalho.pro.br/codpon/ .

- *Underwater optical ad-hoc sensor networks*:

  http://www.uontechnologies.com/

D. 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.

E. PATENTS

- Provisional Patent AZTE.P0104US.P1 , UNDERWATER MULTI-HOP COMMUNICATIONS NETWORK (see Section K)

F. ENTREPRENEURIAL

- *UON Technologies*, founding partner, www.uontechnologies.com (see Section K)

G. GRADUATE 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
Michael Reeves	MS	(2013-15)	The Effects of Bollinger Bands on Delta Probability	
Rachit Agarwal	MS in CE	(2014-15)	Incorporating Uncertainties into Data Mule DTN Networks, with focus on an Amazon scenario	

ii. MS THESES IN PROGRESS

Student	Degree	Duration	Thesis Title

iii. 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	
Jin Zhang	PhD	(2008-12)	Jamming-resistant MAC protocols	Google
Xinhui Hu	PhD	(2010-15)	Resource allocation with Applications on the Cloud	Google

* Donglin Xia received the *Best CSE PhD Student Award*, 2008, and the Best CSE TA Award, 2007.

iv. Ph.D. THESES IN PROGRESS

Student	Degree	Duration
Chenyang Zhou	PhD	(2011-present)
Mengxue Liu	PhD	(2012-present)
Zahra Derakhshandeh	PhD	(2013-present)

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

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

v. UNDERGRADUATE HONORS THESIS (ASU Barrett Honors College)

Student	Duration	Project Title
Xiao Wang	(2015-present)	Overlay Network Design by Pruning
Alexandra Porter	(2015-present)	Self-stabilizing Coating Algorithms for Programmable Matter
Joshua Daymude	(2014-present)	Self-organizing Particle Systems: Compaction
Miles Laff	(2014-15)	Expansion Algorithms for Self-organizing Particle Systems
Ryan Sowa	(2011-13)	Extending NS-3 for Three-dimensional Wireless Networks
Christopher Fulton Shiflet	(2001-02)	Analysis of Mobility Models in Mobile Ad-Hoc Networks

H. PROFESSIONAL and SCIENTIFIC SERVICE

i. SCIENTIFIC and PROFESSIONAL SOCIETY MEMBERSHIPS

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

ii. EDITORSHIPS

- **Associate Editor**, IEEE Transactions on Mobile Computing, IEEE publishing (2012-present).
- **Associate Editor**, Ad-Hoc Networks, Springer-Verlag (2010-12).

- **Guest Editor,** ACM Baltzer Journal on Mobile Networks and Applications (MONET) Special Issue on "Foundations of Mobile Computing", 11(2), 2006.
- **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.

- 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
- Proceedings of the Thirteenth International Symposium on Stabilization, Safety, and Security of Distributed (**SSS**), 2012

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
- Dagstuhl Workshop on "Algorithmic Foundation of Programmable Matter", July 2016, Germany.
- NSF Workshop on Self-organizing Particle Systems (**SOPS**), 2014
- 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

- NSF Workshop on Self-organizing Particle Systems (**SOPS**), 2014

- 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

Track Chair

- Special Track on "Algorithmic Foundations of Biological-inspired Systems", **SIROCCO**, 2015

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 – 2011

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

- ACM Thirty-second Annual ACM SIGACT-SIGOPS Symposium on Principles of Distributed Computing (**PODC)**, 2012

- Twenty-fifth ACM Symposium on Parallelism in Algorithms and Architectures (**SPAA**), 2013

- International Symposium on Distributed Computing (**DISC**), 2013

- ACM Symposium on Theoretical Computer Science (**STOC**), 2013

- Latin American Theoretical Informatics (**LATIN**), 2014

- International Workshop on Algorithmic Aspects of Wireless Sensor Networks (**ALGOSENSORS**), 2014

- 41st International Colloquium on Automata, Languages, and Programming (**ICALP)**, 2014

- IEEE International Parallel and Distributed Processing Symposium (**IPDPS**), 2015

- SIAM Algorithm Engineering and Experiments (**ALENEX**), 2016

- ACM Thirty-sixth Annual ACM SIGACT-SIGOPS Symposium on Principles of Distributed Computing (**PODC)**, 2016

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
  - ACM Transactions on Algorithms.

- 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/panelist for several research grant proposals, including
  - National Science Foundation (NSF)*
  - Swiss National Science Foundation.
  - US-Israel Binational Science Foundation (BSF)

* Some recent NSF Panels:

  - NSF Panel, Algorithmic Foundation (AF), March 2012
  - NSF Panel, Computer System Research (CSR), March 2013
  - NSF Panel, Algorithmic Foundation (AF), March 2015.

I. UNIVERSITY COMMITTEE SERVICE

University level

(2013-present) US-Brazil Collaboration Initiative, Vice-provost Office

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

Ira A. Fulton Schools of Engineering (College level)

(2012-13)   IAFSE Curriculum Committee

(2011-13)   IAFSE Committee of Review

(2005-07)   IAFSE Committee of Review

(2001-02)   Self-Study Committee for CSE

(2000-01)   CSE Chair Search Committtee

School of Computing, Informatics, and Decision Systems Eng. (Academic Unit level)

(2014-2015)   Computer Engineering Graduate Comrehensive Exam Coordinator

(2001-present) CSE 310 Course Coordinator

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

(2012-13)   CSE-CIDSE Graduate Admissions Committee

(2010-11)   CSE-SCIDSE Graduate Program Committee

(2007)   CSE Personnel Committe

(2006-07)   CSE ABET Committe

(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

(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 Admisssions Committee

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

J. 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 Wireless Communication
CSE 591 Theory of Dynamic Communication Networks

Recent Teaching Evaluations (2012-15)

In the teaching evaluations below, aggregates for the *instructor* and *course content* portions of the teaching evaluations submitted by the students to the respective classes are provided; the aggregate evaluations are on a 5-point scale. Many of the sections for CSE 450/598 are combined or hybrid, but still reported separately for the course evaluations.

Hybrid and online sections are marked: students tend to strongly prefer the regular, in-class instruction classes (as evidenced by the student comments on the respective course student evaluations), and this has a strong impact on the course and instructor student evaluations. Online classes were all taught as an addendum to one of the CSE 598 hybrid classes; each section of CSE 450 was combined with a section of CSE 598 up until Fall 2014.

Instructor Evaluations

Term	Course Title	Course	Instructor
2015 Spring	CSE 450 Richa	4.57	4.64
2015 Spring	CSE 552 Richa	4.47	4.44
2014 Fall	CSE 450 Richa, hybrid	4.08	4
2014 Fall	CSE 598 Richa, hybrid	3.82	4.15
2014 Fall	CSE 598 Richa, online	3.28	3.85
2014 Fall	CSE 450 Richa, hybrid	3.83	4.49
2014 Fall	CSE 598 Richa, hybrid	3.93	4.18
2014 Spring	CSE 450 Richa, hybrid	4.38	4.63
2014 Spring	CSE 598, hybrid	3.83	4.18
2014 Spring	CSE 450 Richa, hybrid	4.01	4.27
2014 Spring	CSE 598 Richa, hybrid	3.89	4.18
2013 Fall	CSE 450 Richa	4	3.83
2013 Fall	CSE 598 Richa	4.17	4.47
2013 Fall	CSE 598 Richa, hybrid	3.96	4.25
2013 Fall	CSE 598 Richa, hybrid	4.05	4.27

Term	Course Title	Course	Instructor
2013 Spring	CSE 310 Richa	4.1	4.05
2013 Spring	CSE 591 Richa	4.41	4.6
2012 Fall	CSE 450 Richa	4.08	4.44
2012 Fall	CSE 598 Richa	4.29	4.34
2012 Fall	CSE 550 Richa	3.9	4
2012 Spring	CSE 310 Richa	4.33	4.46

ii. NEW COURSE and COURSE MATERIAL DEVELOPED

New Courses Developed
Undergraduate\Graduate
CSE 450/598, Design and Analysis of Algorithms, **hybrid format**, Fall 2013

- I had my classes taped for this course and had the first offering of CSE 450/598 as a hybrid class in Fall 2013, Spring and Fall 2014, where students were supposed to watch the lecture videos at home and have an in-person in-class meeting once a week devoted to answering any questions the students might have, do problem solving, etc. I particularly enjoyed this innovative flipped classroom format and I think the students benefitted quite a bit from having an extra hour of instructor time every week (even if the student themselves seem to prefer the in-class lecture delivery mode).

Graduate
CSE 552 Randomized and Approximation Algorithms, Spring 2015
- While this course had already been offered at ASU, it had been offered on a sporadic basis and so I have developed my own curriculum and course material for the class in Spring 2015.

CSE 551 **Foundations of Algorithms, Spring 2015**
- This course was created from the CSE 598 Design and Analysis of Algorithms class (which was offered as an advanced undergrad and low level grad class), and is now a graduate-only class.

CSE 591, **Theory of Wireless Communication, Spring 2013**

- This course evolved from the "Theory of Dynamic Communication Networks" course outlined below, to focus solely on wireless communication aspects. The course addresses the problems of broadcasting, routing, node location services and distributed hash tables, synchronization, reliable MAC protocols, topology control, self-stabilization, etc. 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.

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 below.

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

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 new courses in network algorithms in Spring 1999, Spring 2010, and Spring 2013. Together with Prof. Konjevod, we introduced a new course in randomized and approximation algorithms, CSE 552 Randomized and Approximation Algorithms.

iii. UNDERGRADUATE PROJECTS SUPERVISED

(a) Undergraduate Thesis (ASU Barrett Honors College)

Student	Duration	Project Title
Xiao Wang	(2015-present)	(to be determined)
Alexandra Porter	(2015-present)	Self-stabilizing Coating Algorithms for Programmable Matter
Joshua Daymude	(2014-present)	Self-organizing Particle Systems: Compaction
Miles Laff	(2014-15)	Expansion Algorithms for Self-organizing Particle Syst.
Ryan Sowa	(2011-13)	Extending NS-3 for Three-dimensional Wireless Networks
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	(2010-2011)	Dynamic De Bruijn Graph
Miles Laff	(2015)	Expansion Algorithms for Self-organizing Particle Systems
Joshua Daymude	(2015)	Self-organizing Particle Systems: Contracting

NSF Research Experience for Undergraduates (REU)

Student	Duration	Project Title
Phillip Stevens	(2010-11)	Theory of Self-Stabilizing Overlay Networks*
Jadiel de Armas	(2011-12)	Theory of Self-Stabilizing Overlay Networks*
Miles Laff	(2014-15)	EAGER: Self-organizing Particle Systems*
Joshua Daymude	(2014-present)	EAGER: Self-organizing Particle Systems*
Alexandra Porter	(2015-present)	EAGER: Self-organizing Particle Systems*

• 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
Alex Iadicicco	Spring 2015	CSE 450	Skip Lists
Nikil Selvam	Fall 2014	CSE 450	How To Think About Brainteasers Using Alg.
Grant Marshall	Spring 2014	CSE 450	RSA and Related Algorithms
Garth Bjerk	Spring 2014	CSE 450	(additional coursework)
Alex Iadicicco	Spring 2013	CSE 310	Visualization of Sorting Algorithms
Louis Wilson	Fall 2012	CSE 450	(additional coursework)
Shantanu Bala	Spring 2012	CSE 310	Multithreaded Algorithms
Beatris Rusu	Fall 2009	CSE310	Network Flows
Michael Fruchtman	Spring 2009	CSE450	(additional coursework)
Travis Portz	Spring 2009	CSE450	(additional coursework)
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

K. SELECTED SYNERGETIC and OUTREACH ACTIVITIES

- **Leader in emerging ASU-SOPS initiative:** The self-organizing systems constituting living and programmable (non-living) matter possess computationally limited particles at the micro-scale, which through the implementation of programmable logic yield emergent behavior at the macro-scale that is not yet understood. I am in the process of leading a multi-disciplinary research initiative on such self-organizing particle systems (SOPS) at ASU with the goals of (i) providing a better understanding of the emergent properties and computational limitations of living and programmable matter, and of (ii) devising the processes (algorithms) that would allow computer scientists and engineers to "replicate" the biological collective computation in a synthetic system. Research on understanding and designing such self-organizing particle systems (SOPS) requires intellectual collaboration among many different disciplines, and I have put together a group of distinguished researchers at ASU working in the many facets of SOPS: Prof. Sara I. Walker (physics/astrobiology), Prof. Spring Berman (robotics\mechanical engineering), Prof. Sebastien Motsch (math), Prof. Stephen Pratt (life sciences), Prof. Ted Pavlic (sustainability/industrial engineering), in addition to myself in computer science. We are currently seeking opportunities to jumpstart a research initiative on SOPS at ASU, possibly through the Biomimicry Center. We expect to eventually grow this research initiative outside of ASU. I currently lead the "Algorithmic Foundation of SOPS" research group at ASU, and have secured over $600k in funding from NSF for my research in this area in the past two years. Upon invitation form NSF, I organized the pioneering NSF Workshop on Self-organizing Particle Systems (SOPS).

- **Invited Speaker at Biomimicry Center Launch event** I was one of the ten invited speakers from ASU for the Biomimicry Center launch event in March of this year at ASU. I am in the process of getting formally affiliated and directly involved in research initiatives through the Biomimicry Center, such as the SOPS initiative outlined above.

- **Leader in Adversarial Modeling for Wireless Communication**: I have consolidated myself in providing the algorithmic theoretical foundation of wireless networks, in particular starting the line of work in adversarial modeling of wireless communication, which has been followed by many other researchers. I will write a book on this topic as part of a monograph series in Distributed Computing during my sabbatical year of 2015-16.

- **Entrepreneurial activities and innovation in underwater optical ad-hoc sensor networks:** In collaboration with Prof. Cody Youngbull, SESE, ASU, we have made it viable to use lightwave wireless sensor devices for muti-hop underwater communication, which poses many new and interesting challenges in point-to-point and multi-hop network algorithm design: We have a *provisional patent application* on multi-hop routing algorithms developed for such domains. This work has immediate practical applications and hence, in partnership with MacArtney Underwater Technology Group, we started *UON technologies*, a company created to address the needs of several underwater applications that can benefit from the type of lightwave sensor networks we can offer. http://www.uontechnologies.com/

- **A data mule network focused on Amazon riverine population with e-health applications (CoDPON):** Research collaboration with Profs. Alon Efrat and Thienne Johnson, U. of Arizona, USA, and Prof. Mauro Margalho, U. da Amazonia, Brazil, with potential support from Samsung and Google Latin America, in partnership with the hospital Santa Casa de Belem and other medical doctors in the area. CoDPON networks are a specific DTN/Data Mule system inspired on air traffic control systems that aims to provide technological inclusion in areas lacking any communication infrastructure. The focus are Amazon scenarios where the fluvial mesh is the unique means of access to the riverine communities. http://www.margalho.pro.br/codpon/

- **Engineering research liason of the ASU-Brazil Initiative team:** serving as the liason for research in Engineering between ASU and top institutions in Engineering and Computer Science in Brazil, jumpstarting international collaboration agreements with the Federal University of Rio de Janeiro (UFRJ) and its graduate school of Engineering (COPPE), the Catholic University of Rio de Janeiro (PUC-Rio), and the State University of São Paulo (USP). In Fall 2013, I participated in the 3rd US-Brazil Innovation Summit, a high profile Summit involving high profile government, industry, and

university representatives from both countries. I continue to establish collaboration projects with Brazil within and outside the "Science Without Borders" program set up by the Brazilian government, the latest of which is a research project with U. of Campinas, Brazil.

- **International Collaboration with several of the top institutions in Computer Science in Germany**, namely with University of Paderborn, Technical U. of Berlin, Technical U. of Munich, and the Telekom Labs. My international collaboration with Prof. Christian Scheideler, now at the U. of Paderborn, and Dr. Stefan Schmid at the Technical U. of Berlin and Telekom Labs has not only resulted in high impact research publications, but is also an integral component in my NSF funded "Theory of Self-stabilizing Overlay Networks", "Adversarial Models for Wireless Communication", and "Self-organizing Particle Systems" grants (Prof. Scheideler independently submits counterpart proposal to the German DFG in order to fund his part of the research). I am a potential graduate mentor for students in the international graduate school under planning at the U. of Paderborn, Germany.

- **Collaboration with Industry:** Potential collaboration with Samsung and Google Latin America on the CoDPON Amazon project; continuing collaboration with the Telekom Labs, Germany, in particular in porting cloud over the network prototype from the Telekom Labs/Technical U. of Berlin to ASU, as part of the Internet2 project.

- **Promote more female and Hispanic students in Computer Science:** As a female professor in Computer Science, it is my goal to encourage more female students to pursue or further continue their studies in Computer Science, which has proven successful, given that I have had four female PhD students (two current, two graduated), three female MS students, and two female undergraduate student working on research (one current). Moreover, since I am also of Hispanic origin, I strive to serve as a role model in the classroom for the under-represented Hispanic students in CS at ASU.

- **Undergraduate Research:** I currently have three outstanding undergraduate students working on my research in self-organizing particle systems, continuing a strong line of supervising undergraduate research.

- **Enhance diversity in STEM 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.