

# Jorge Arturo Cobb

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## Address

Erik Jonsson School of Engineering and Computer Science  
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The University of Texas at Dallas  
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## Education

Ph.D. May 1996 The University of Texas at Austin  
Department of Computer Sciences  
Austin, TX 78712-1188  
GPA 4.00

M.A. August 1989 The University of Texas at Austin  
Department of Computer Sciences  
Austin, TX 78712-1188  
GPA 4.00

B.S. December 1987 The University of Texas at El Paso  
Department of Computer Science  
El Paso, TX 79968  
GPA 4.00

## Academic Awards and Honors

AT&T Scholarships

- AT&T Ph.D. Scholarship (1992-1996).
- AT&T Denver Laboratories Scholarship (1986-1987).

The University of Texas at Austin Scholarships

- Microelectronics and Computer Development Fellowship (1990-1992).

The University of Texas at El Paso Scholarships and Honors

- Graduated with Highest Honors – Summa Cum Laude.
- Student Marshal of the College of Engineering for the graduation ceremonies.
- Frank N. Farah Presidential Scholarship (1986-1987).
- Lucille L. Stevens Scholarship (1984-1985).
- National Dean's List.

## Ph.D. Dissertation

Flow Theory and the Analysis of Timed-Flow Network Protocols (May, 1996)

Advisor: M. G. Gouda

### **Employment Experience**

The University of Texas at Dallas, Richardson, TX, Computer Science Department

- Associate Professor - Fall 2005 to present.

The University of Texas at Dallas, Richardson, TX, Computer Science Department

- Assistant Professor - Fall 1998 to Spring 2005.

University of Houston, Houston TX, Computer Science Department

- Assistant Professor - Fall 1995 to Spring 98.

AT&T Bell Laboratories, Murray Hill, NJ

- Member of the Technical Staff - Summer 1993 and Summer 1994, Summer internship for research in computer networks.

The University of Texas at Austin, Austin, TX

- Teaching Assistant for Database Management - Fall 1991 and Spring 1992.

AT&T Information Systems, Denver, CO

- Member of the Technical Staff - PBX programmer, 1989-1990.

### **Research Interests**

Design and implementation of network protocols.  
Quality of Service in High-speed computer networks.  
Mobile computing.  
Concurrent and distributed computing.

### **Teaching Interests**

Undergraduate:   Computer Networks  
                          Database Systems  
                          Computer Architecture  
Graduate:         Computer Networks  
                          Distributed Systems

### **Professional and Academic Organizations**

Member of IEEE

### **Miscellaneous**

Speak fluent Spanish

## Journal Publications

### In Review

1. Jorge A. Cobb, Mohamed G. Gouda, "Stabilization of Max-Min Fair Networks without Per-flow State", submitted to *Theoretical Computer Science*, December 2009.
2. Mohamed Gouda, Jorge Cobb, Chin-Tser Huang, Srikanth Sastry, Scott Pike, "Fault-Masking in Redundant Systems", to be submitted March, 2009.

### Published

1. Ravi Musunuri, Jorge Cobb, "Distributed Out-bound Load Balancing in Inter-AS Routing by Random Matchings", *Telecommunication Systems*, Springer, Vol 34, No. 1-2, February 2007.
2. Ravi Musunuri, Jorge Cobb, "An Overview of Solutions to Avoid Persistent BGP Divergence", *IEEE Network*, Vol. 19, Issue 6, Nov.-Dec. 2005, pp. 28 - 34.
3. Jorge Cobb, Mohamed Gouda, Deepinder Sidhu, "Hello Again: Convergence of the Hello Protocol in OSPF", *Journal of High-Speed Networks*, IOS Press, Vol. 14, No. 1, 2005, pp. 39-58.
4. Jorge Cobb, "Scalable Quality of Service across Multiple Domains", *Computer Communications*, Elsevier, Vol. 28 (2005), pp. 1997-208.
5. Jorge Cobb, Miaohua Lin, "The Timely-Token Protocol", *Computer Communications*, Elsevier, Vol. 27 No. 7, pp. 569-580, 2004.
6. Jorge Cobb, Miaohua Lin, "A Theory of Multi-Channel Schedulers for Quality of Service", *Journal of High-Speed Networks*, IOS Press, Vol 12 Nos. 1 and 2, pp. 61-86, 2002.
7. Jorge Cobb, Mohamed Gouda, "Stabilization of General Loop-Free Routing", *Journal of Parallel and Distributed Computing*, Academic Press, Vol 62, pp. 922-944, 2002.
8. Jorge Cobb, "Preserving Quality of Service Guarantees In-Spite of Flow Aggregation", *IEEE/ACM Transactions on Networking*, Vol 10 No. 1, pp. 43-53, February 2002.
9. Sang-Man Bak, Jorge Cobb, Ernst Leiss, "Performance Evaluation of Load-Balanced Routing via Bounded Randomization", *CLEI Electronic Journal*, Vol. 3, No 2., December 2000.
10. Jorge Cobb, "Universal Timestamp Scheduling for Real-Time Networks", *Computer Networks*, Elsevier, Vol 31(1999), pp. 2341-2360.
11. Jorge Cobb, Mohamed Gouda and Amal-El Nahas, "Time-Shift Scheduling: Fair Scheduling of Flows in High-Speed Networks", *IEEE/ACM Transactions on Networking*, Vol. 6, No. 3, June 1998, pp. 274-285.
12. Jorge Cobb, Mohamed Gouda, "Flow Theory", *IEEE/ACM Transactions on Networking*, Vol. 5, No. 5 , Oct. 1997 pp. 661-674.

13. Jorge Cobb, Mohamed Gouda, "The Request-Reply Family of Group Routing Protocols", *IEEE Transactions on Computers*, Vol. 46 No. 6, June 1997, pp. 659-672.
14. Jorge Cobb, Mohamed Gouda, "Group Routing without Group Routing Tables, an Exercise in Protocol Design", *Computer Communications*, Elsevier, Vol. 19 (1996), pp. 1161-1174.

## Invited Talks

- “Hello Again: Convergence of the Hello Protocol in OSPF”, Luminy Seminar on Self-Stabilization, Marseille, France, October, 2002.

## Conference Publications

1. Jorge A. Cobb, “Work-Conserving Fair-Aggregation with Rate-Independent Delay”, *IEEE International Conference on Computer Communication and Networks (ICCCN)*, pp. 1-6, US Virgin Islands, August 3-7, 2008.
2. Jorge A. Cobb and Mohamed G. Gouda, “Stabilization of Max-Min Fair Networks without Per-flow State”, *Stabilization, Safety, and Security of Distributed Systems*, Springer Lecture Notes in Computer Science 5340, 2008, pp. 156-172.
3. Taehwan Choi, Soel Son, Mohamed G. Gouda, and Jorge A. Cobb “Pharewell to Phising”, *Stabilization, Safety, and Security of Distributed Systems*, Springer Lecture Notes in Computer Science 5340, 2008, pp. 233-245.
4. Jorge A. Cobb, Zhe Xu, “Intra-Flow Fairness in Work-Conserving Flow Aggregation” *IASTED International Conference on Parallel and Distributed Computing and Systems (PDCS)*, Cambridge, Massachusetts, November, 2007, pp. 932-938.
5. Jorge A. Cobb, “Stabilization of Loop-Free Redundant Routing”, *Stabilization, Safety, and Security of Distributed Systems*, Springer Lecture Notes in Computer Science # 4838, 2007, pp. 154-172.
6. Jorge A. Cobb, Zhe Xu, “Fair-Aggregation Across Multiple Core Networks”, *IEEE International Conference on Computer Communication and Networks (ICCCN) Workshop on Advanced Networking and Communications*, Hawaii, August 2007, pp. 435–442.
7. Jorge A. Cobb, Zhe Xu, “Guaranteed Throughput in Work-Conserving Flow Aggregation Through Deadline Reuse”, *IEEE International Conference on Computer Communication and Networks (ICCCN)*, Arlington, Virginia, 2006, pp. 87-94
8. Mohamed G. Gouda, Jorge A. Cobb and Chin-Tser Huang, “Fault Masking in Tri-redundant Systems”, *Stabilization, Safety, and Security of Distributed Systems*, Springer Lecture Notes in Computer Science # 4280, 2006, pp. 304–313.
9. Jorge A. Cobb, “On the Complexity of Channel Assignment for Real-Time Flows”, *IASTED International Conference on Parallel and Distributed Computing and Systems (PDCS)*, Dallas, TX, November 2006, paper # 513-142 (8 pages).
10. Jorge A. Cobb, Zhe Xu, “Maintaining Flow Isolation in Work-Conserving Flow Aggregation”, *IEEE GLOBECOM 2005*, St. Louis, Missouri.
11. Ravi Musunuri, Jorge Cobb, “Hierarchical-Battery Aware Routing in Wireless Sensor Networks”, *IEEE Vehicular Technology Conference*, Vol. 4, September 2005, pp. 2311-2315.

12. Ravi Musunuri, Jorge Cobb, "Distributed Out-bound Load Balancing in Inter-AS Routing by Random Matchings", *IEEE International Conference on Computer Communication and Networks (IC3N)*, October 2005, pp. 469-475. **Candidate for Best Paper Award.**
13. Ravi Musunuri, Jorge Cobb, "Comprehensive Solution for Anomaly-Free BGP", *The 5th IEEE International Workshop on IP Operations & Management*, October 26-28, 2005, Barcelona, Spain, Springer Lecture Notes in Computer Science (LNCS-3751), pp. 130-141.
14. Ravi Musunuri, Jorge Cobb, "Enforcing iBGP Convergence", *IEEE International Conference on Networks (ICON)*, Singapore, November, 2004.
15. Jorge Cobb, Ravi Musunuri, "Enforcing Convergence in Inter-Domain Routing", *IEEE Global Telecommunications Conference (GLOBECOM)*, Dallas, November, 2004.
16. Ravi Musunuri, Jorge Cobb, "A Complete Solution to Stable iBGP", *IEEE International Conference on Communications (ICC)*, Paris, June, 2004.
17. Ravi Musunuri, Jorge Cobb, "Scalable iBGP through Selective Path Dissemination", *IASTED International Conference on Parallel and Distributed Computing and Systems (PDCS)*, November, 2003.
18. Hua Zhu, Imrich Chlamtac, Jorge Cobb, and Guoping Zheng, "SMART: A Synchronization Scheme for Providing Multimedia Quality in the Emerging Wireless Internet", *IEEE Vehicular Technology Conference*, October 2003.
19. Jorge Cobb, Mohamed Gouda, Ravi Musunuri, "A Stabilizing Solution to the Stable Path Problem", *Symposium on Self-Stabilizing Systems*, Springer-Verlag Lecture Notes in Computer Science 2704, June 2003.
20. Jorge Cobb, "Forward-Only Unidirectional Routing", *IEEE International Conference on Computer Communication and Networks (IC3N)*, October 2002, Miami, Florida.
21. Jorge Cobb, Miaohua Lin, "The On-Time Timed-Token Protocol", *IEEE GLOBECOM 2002*, Taipei, Taiwan.
22. Jorge Cobb, Miaohua Lin, "End-to-End Delay Guarantees for Multiple-Channel Schedulers", *IEEE International Workshop on Quality of Service (IWQoS)*, May 2002.
23. Jorge Cobb, "Preserving Quality of Service without Per-Flow State", *IEEE International Conference on Network Protocols (ICNP)*, November 2001.
24. Jorge Cobb, Mohamed Gouda, "Stabilization of Routing in Directed Networks", *Fifth Workshop on Self-Stabilizing Systems (WSS)*, Springer-Verlag Lecture Notes in Computer Science 2194, October 2001.
25. Jorge Cobb, "On The Selection of Optimum Paths in Computer Networks", *IEEE International Conference on Communications (ICC)*, June 2001.
26. Quiyang Fang, Jorge Cobb, Ernst Leiss, "A Pre-Selection Routing Scheme for Virtual Circuit Networks", *IASTED International Conference on Parallel and Distributed Computing and Systems (PDCS)*, 2000.

27. Jorge Cobb, "Convergent Multi-Path Routing", *IEEE International Conference on Network Protocols, IEEE International Conference on Network Protocols (ICNP)*, November 2000.
28. Sang-Man Bak, Albert Cheng, Jorge Cobb, Ernst Leiss, "Load-Balanced Routing and Scheduling for Real-Time Traffic in Packet-Switched Networks", *IEEE Conference on Local Computer Networks (LCN)*, 2000.
29. Jorge Cobb, "An In-Depth Look at Flow Aggregation for Quality of Service", *IEEE International Conference on Network Protocols*, 1999.
30. Jorge Cobb, "Dynamic Multicast Trees", *IEEE International Conference on Networks (ICON)*, 1999
31. Sang-Man Bak, Jorge Cobb, Ernst Leiss, "Load-Balanced Routing via Bounded Randomization", *IASTED International Conference on Parallel and Distributed Computing and Systems (PDCS)* 1999.
32. Sang-Man Bak, Jorge Cobb, Ernst Leiss, "Hierarchical Load-Balanced Routing via Bounded Randomization", *IEEE International Conference on Computer Communication and Networks (IC3N)*, 1999.
33. Sang-Man Bak, Jorge Cobb, "Randomized Distance Vector Routing Protocol", *ACM Symposium on Applied Computing*, 1999.
34. Jorge Cobb, "Preserving Quality of Service Guarantees In-Spite of Flow Aggregation", *IEEE International Conference on Network Protocols (1998)*, 1998, **selected for fast-track publication in IEEE/ACM Transactions on Networking.**
35. Jorge Cobb, "Fault-Tolerant Multi-Metric Routing", *IASTED Principles of Distributed Computing and Networks (PDCN)*, 1998.
36. Jorge Cobb, "Universal Timestamp Scheduling", *16th IASTED International Conference on Applied Informatics*, 1998.
37. Jorge Cobb, Mohamed Gouda, "Balanced Routing", *IEEE International Conference on Network Protocols*, 1997.
38. Jorge Cobb, Mohamed Waris, "Propagated Timestamps: A Scheme for the Stabilization of Maximum Flow Routing Protocols", *Third Workshop on Self-Stabilizing Systems (WSS)*, 1997.
39. Jorge Cobb, Mohamed Gouda, "Group Routing without Group Routing Tables", *IEEE International Conference on Distributed Computing Systems (ICDCS)*, 1996, **selected for fast-track publication in IEEE/ACM Transactions on Networking.**
40. Jorge Cobb, Mohamed Gouda, Amal El-Nahas, "Time-Shift Scheduling: Fair Scheduling of Flows in High-Speed Networks", *IEEE International Conference on Network Protocols (ICNP)*, 1996, **selected for fast-track publication in IEEE/ACM Transactions on Networking.**

41. Jorge Cobb, Mohamed Gouda, "Ordered Delivery over One-way Virtual Circuits", *IEEE Symposium on Computers and Communications (SCC)*, 1995.
42. Jorge Cobb, Prathima Agrawal, "Congestion or Corruption: A Scheme for Efficient Wireless TCP Sessions", *IEEE Symposium on Computers and Communications (SCC)*, 1995.
43. Jorge Cobb, Mohamed Gouda, Amal El-Nahas, "Flow Timestamps", *International Conference on Computer Science and Informatics*, 1995.
44. Jorge Cobb, Mohamed Gouda, Prathima Agrawal, "Protocol Synchronization with Sparse Timestamps", *Protocol Specification, Testing and Verification (PSTV) XIV*, edited by Son T. Voung and Samuel T. Chanson, Chapman and Hall publishers, 1994.
45. Jorge Cobb, Chris Edmondson-Yurkanan, Mohamed Gouda, "Universal Mobile Addressing in The Internet", *IEEE Workshop on Mobile Computing Systems and Applications*, 1994.
46. Jorge Cobb, Mohamed Gouda, "Flow Theory: Verification of Rate-Reservation Protocols", *IEEE International Conference on Network Protocols (ICNP)*, 1993.

## Funding

- “CHAMPS: CHallenging Algorithmics and Mathematics in Problem Solving for middle-school students”, \$2,700,000, Principal-Investigator, Co-PI’s: Gopal Gupta, Kang Zhang, Sook Kim, et al., National Science Foundation GK-12 Program. 2/2008-2/2013.
- “Salable Quality of Service Guarantees”, \$30,000, Erik Jonsson School of Engineering & Computer Science internal grant, 2004.
- “Optical Pseudo Channels: using the Optical Layer to Minimize Queuing Delays for Real-Time Traffic”, Principal Investigator, Texas Advanced Research Program, \$101,150, in collaboration with Co-PI Andrea Fumagalli, 1/2000-12/2001
- “Mobility Simulation”, Principal Investigator, Northern Telecom, \$75,000, 1/1999-12/1999.

## Student Supervision

### Ph.D. Theses

- “Randomized Routing Algorithms”, Sang-Man Bak, co-supervised by Prof. Ernst Leiss, May 2000 (University of Houston), currently at a Telecom company, Korea.
- “Protocols for Convergence and Load-balancing in Inter-domain Routing”, Ravi Musunuri, UT Dallas, Summer 2006, currently at CISCO systems, California.
- “Scalable Scheduling for Quality of Service Guarantees”, Zhe Xu, UT Dallas, Fall '07.

### Master Theses

- “Adaptable Multicast Trees”, Mohamad Khan, December 2000 (University of Houston).
- “A Pre-Selection Routing Scheme for Virtual Circuit Networks”, Quiyan Fang, December, 1999 (University of Houston).
- “Definition and Implementation of the Balanced Routing Protocol”, Joseph Chedraoui, December, 1999. (University of Houston).
- “Advanced Flow Aggregators”, Madhura Joglekar, August, 1999 (University of Houston).
- “Last Hop Acknowledgments”, Venkatesh Muthu, May 1998 (University of Houston).
- “Maximum Flow Routing”, Mohamed Waris, May 1998 (University of Houston).

## Service

### Journals

Associate Editor, Journal of High Speed Networks, IOS Press.

Co-Editor, *Wireless Networks* special issue on selected papers from the QShine '04 conference.

Reviewer for IEEE Transactions on Parallel and Distributed Systems, IEEE Transactions on Networking, IEEE Communication Letters, Computer Networks (Elsevier), Computer Communications (Elsevier), among others.

### Chair Technical Program Committees

TPC Co-chair, First International Conference on Quality of Service in Heterogeneous Wired/Wireless Networks (QShine), 2004.

TPC Co-chair, Autonomous Distributed Systems and Networks, 2002.

### Conference Technical Program Committees

2008 International Conference on Wireless Algorithms, Systems and Applications

2008 IEEE International Conference on Network Protocols

2008 IEEE Local Computer Networks Conference

2008 IEEE International Conference on Computer Communications and Networks

2008 Autonomous Distributed Systems and Networks

2007 Eighth International Symposium on Stabilization, Safety, and Security of Distributed Systems

2007 IEEE International Conference on Distributed Computing Systems (ICDCS)

2007 Autonomous Distributed Systems and Networks

2007 GLOBECOM WASNet

2007 IEEE International Conference on Network Protocols

2007 Local Computer Networks Conference

2007 International Conference on Communications (CC)

2007 International IEEE/Create-Net Conference on Test beds and Research Infrastructures for the Development of Networks and Communities

2006 Eighth International Symposium on Stabilization, Safety, and Security of Distributed Systems

- 2006 International Conference on AD-HOC Networks & Wireless (ADHOCNOW)
- 2006 Autonomous Distributed Systems and Networks
- 2006 GLOBECOM WASNet
- 2006 IEEE International Conference on Network Protocols
- 2006 IEEE International Performance, Computing and Communications Conference
- 2006 Local Computer Networks Conference
- 2006 IASTED Principles of Distributed Computing and Networks
- 2005 Local Computer Networks Conference
- 2005 International Conference on AD-HOC Networks & Wireless (ADHOCNOW)
- 2005 International Symposium on Heterogeneous Wireless Networks (ISHWN 2005)
- 2005 IEEE International Workshop on Radio Resource Management for Wireless Cellular Networks (RRM-WCN)
- 2005 IEEE International Conference on Network Protocols
- 2005 IEEE International Performance, Computing and Communications Conference
- 2005 IASTED Principles of Distributed Computing and Networks
- 2005 Workshop on Internet Compatible QoS in Ad hoc Wireless Networks (ICQAWN)
- 2004 Autonomous Distributed Systems and Networks
- 2004 IEEE International Performance, Computing and Communications Conference
- 2002 The 16th International Conference on Information Networking (ICOIN-16)
- 2002 International Conference Parallel and Distributed Systems
- 2002 IEEE International Performance, Computing and Communications Conference
- 2002 IEEE International Conference on Network Protocols
- 2001 IEEE International Conference on Network Protocols
- 2000 IEEE International Conference on Network Protocols
- 1999 IEEE International Conference on Network Protocols
- 1999 Workshop On Self-Stabilizing Systems
- 1999 Conferencia Latinoamericana de Informatica
- 1998 IEEE International Conference on Network Protocols

1997 IEEE International Conference on Network Protocols

1997 International Conference on Computer Science and Informatics

1996 IEEE International Conference on Network Protocols

**Conference Publicity/Service**

2006 Workshop on Self-Stabilizing Systems, Local Arrangements Chair and Treasurer.

2001 IEEE International Symposium on Autonomous Decentralized Systems, Publicity Chair, Web Master, and handle the submission of papers and collection of reviews.

1999 ACM Mobicom Conference, Publicity Co-Chair

**University Service**

2006-present Admissions Committee CE program

2007-2008 Chair Department Networking Group

2005-2008 Coordinator for the ComputingFest student computer programming contest.

2006-Present Faculty Advisor for the Society of Hispanic Professional Engineers (SHPE).

2005-2008 University Core Committee for the Support of Women and Minorities

2002-present Department Networking Group

2002-present Department Undergraduate Curriculum Committee

2000-2001 University Committee on Effective Teaching

2001-2002 Information Resources Security Committee