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Research Interests

- Design and experimentation of networking and embedded systems
- Performance modeling and evaluation of distributed systems.

Education

- **Ph.D. in Computer Science**, University of Illinois at Urbana-Champaign, May 2004
Thesis Title: Design, Analysis and Empirical Evaluation of Power Management in Multi-hop Wireless Networks
Thesis co-advisor: Prof. Jennifer Hou and Prof. Lui Sha
- **M.S. in Electrical Engineering**, Tsinghua University, P.R. China, May 1998
Thesis Title: On-line adaptation of CDHMM for Large Vocabulary Continuous Speech Recognition System
Thesis advisor: Prof. Zuoying Wang
- **B.S. in Electrical Engineering**, Tsinghua University, P.R. China, June 1996

Employment

- **August 2004 - present**, Tenure-track Assistant Professor, Dept. of Computer Science, University of Houston
- **January 2004 - June 2004**, Post-doctoral Research Fellow, Dept. of Computer Science, University of Illinois at Urbana-Champaign
- **August 2001 - Dec 2003**, Graduate Research Assistant, Dept. of Computer Science, University of Illinois at Urbana-Champaign

Major Research Projects

- Wireless co-existence in medical environments [12/07 – present]
- Wireless structure health monitoring [01/07 – present]
- Theoretical foundation of multihop wireless networks [06/05 – present]
- Network management and diagnosis [06/05 – present]
- Localization using wireless signal in infrastructure networks [08/04 – 08/06]
- Web server performance control using queue theory-based control [01/04 – 06/04]
- Power management for multihop wireless networks [01/01 – 12/04]
- Acoustic localization system using low-end wireless sensor networks [06/02 – 12/04]

List of Refereed Publications

Book Chapters

1. Richard Barton, **Rong Zheng**, “Order-Optimal Data Aggregation in Wireless Sensor Networks”, Handbook of Wireless Mesh & Sensor Networking (accepted)
2. **Rong Zheng** and Jennifer C. Hou, “Power Management and Power Control in Wireless Networks”, Ad Hoc and Sensor Networks, Yi Pan and Yang Xiao (Eds), Nova Science Publishers, 2006.

Journal Papers

1. Qixin Wang, **Rong Zheng**, Ajay Tirumala, Xue Liu, Sha Liu, “Lightning: A Hard Real-Time, Fast, and Lightweight Low-End Wireless Sensor Election Protocol for Acoustic Event Localization”, in IEEE Transactions on Mobile Computing, volume 7, issue 5, pp. 570-584, May, 2008.
2. **Rong Zheng**, “Asymptotic Bounds of Information Dissemination in Power-constrained Wireless Networks”, in IEEE Transactions on Wireless Communications, vol. 7, num. 1, 2008
3. Cris Koutsougeras, Yi Liu, **Rong Zheng**, “Event-driven Sensor Deployment Using Self Organizing Maps”, IJSNET Special Issue on Coverage Problems in Sensor Networks, 2006
4. **Rong Zheng**, Lui Sha, Jatindera Singh Walia, “Local Group Communication-aware MAC Protocols for Wireless Sensor Networks”, International Journal of Wireless Information Networks (IJWIN), (invited paper), 2006
5. **Rong Zheng**, Jennifer Hou and Lui Sha, “Optimal Block Design for Asynchronous Wakeup and Its Applications in Multi-hop Wireless Networks”, IEEE Transactions on Mobile Computing, vol. 5, no. 9, pp. 1228-1241, 2006
6. **Rong Zheng**, Jennifer Hou and Lui Sha, “Performance Analysis of Power Management Policies in Wireless Networks”, in IEEE Transactions on Wireless Communications, vol. 5, no. 6, pp. 1351-1361, 2006
7. **Rong Zheng**, Robin Kravet, “On-demand Power Management for Ad Hoc Networks”, Elsevier Ad Hoc Networks Journal, Volume 3, Number 1, pp 51-68, 2005
8. Guanghui He, **Rong Zheng**, Indranil Gupta, “A Framework for Time Indexing in Sensor Networks”, in ACM Transactions on Sensor Networks (TOSN), 2005 (1) pp. 101-133
9. Chunyu Hu, **Rong Zheng**, Jennifer Hou and Lui Sha. “A Microscopic Study of Power Management in IEEE 802.11 Wireless Networks”, Accepted by International Journal of Wireless and Mobile Computing (IJWMC), special issue on *Medium Access Control for WLANs, WPANs, Ad Hoc Networks, and Sensor Networks*.
10. **Rong Zheng**, Ye Ge, Jennifer Hou and Sandy Thuel. “A Case for Mobility Support with Temporary Home Agent”, ACM Mobile Computing and Communications Review (MC2R), Volume 6, Number 1, January 2002, page 32-46.

Conference Papers

1. Cunqing Hua and Song Wei and **Rong Zheng**, Robust Channel Assignment for Link-level Resource Provisioning in Multi-Radio Multi-Channel Wireless Networks, the 16th IEEE International Conference on Network Protocols (ICNP), 2008
2. **Rong Zheng** and Chengzhi Li, How Good is Opportunistic Routing? – A Reality Check under Rayleigh Fading Channels, The 11-th ACM International Conference on Modeling, Analysis and Simulation of Wireless and Mobile Systems (ACM MSWiM), 2008

3. **Rong Zheng**, On Routing in Lossy Wireless Networks with Realistic Channel Models, The First ACM International Workshop on Foundations of Wireless Ad Hoc and Sensor Networking and Computing, 2008
4. Soji Omiwade and **Rong Zheng** and Cunqing Hua, Practical localized network coding in wireless mesh networks, in Proc. of Annual IEEE Communications Society Conference on Sensor, Mesh and Ad Hoc Communications and Networks (SECON), 2008
5. Cunqing Hua and **Rong Zheng**, “Starvation modeling and identification in dense WLAN networks”, in Proc. of The 27th Annual Joint Conference of the IEEE Computer and Communications Societies (INFOCOM), 2008
6. Amit Pendharkar and Claudio Olmi and **Rong Zheng** and Gangbing Song, “High rate sensing in wireless civil structure monitoring”, The 11th Biennial ASCE Aerospace Division International Conference – Intelligent Sensors and Actuators Track, 2008
7. Soji Omiwade and **Rong Zheng** and Cunqing Hua, “Butterflies in the mesh: lightweight localized wireless network coding”, in Proc. of Fourth Workshop on Network Coding, Theory, and Applications (Netcod), 2008
8. Sumit Gupta and **Rong Zheng** and Albert Cheng, “ANDES: an Anomaly Detection System for Wireless Sensor Networks”, in Proc. of The Fourth IEEE International Conference on Mobile Ad-hoc and Sensor Systems (MASS), 2007
9. **Rong Zheng**, Richard Barton, “Toward Optimal Data Aggregation in Random Wireless Sensor Networks”, in Proc. of The 26th Annual Joint Conference of the IEEE Computer and Communications Societies (INFOCOM), 2007
10. Muqsith A Mohammad, **Rong Zheng**, Richard Barton, “Location Sensing Using Minmax Robust Thin-plate Spline”, The Forty-Fourth Annual Allerton Conference on Communication, Control, and Computing, 2006
11. **Rong Zheng**, “Information Dissemination in Power-constrained Wireless Networks”, Proceedings of the 25th Annual Joint Conference of the IEEE Computer and Communications Societies (INFOCOM) 2006
12. Richard Barton and **Rong Zheng**, Cooperative Time-Reversal Communication is Order-Optimal for Data Aggregation in Wireless Sensor Networks, in Proc. of IEEE International Symposium on Information Theory (ISIT), 2006.
13. R. J. Barton and **Rong Zheng**, “Order-Optimal Data Aggregation in Wireless Sensor Networks Using Cooperative Time-Reversal Communication,” Proceedings of the 40th Annual Conference on Information Sciences and Systems (CISS), Princeton, NJ, pp. 1050-1055, March 22-24, 2006.
14. **Rong Zheng**, Lui Sha, “MAC Layer Support For Group Communication in Wireless Sensor Networks”, 2nd IEEE International Conference on Mobile Ad-hoc and Sensor Systems (IEEE MASS) 2005
15. **Rong Zheng**, Jennier Hou and Lui Sha, “On Time-out Driven Power Management Policies for Wireless Networks”, GlobeCom 2004
16. **Rong Zheng**, Guanghui He, Indranil Gupta, Jennifer Hou and Lui Sha, “Time Indexing in Sensor Networks”, 1st IEEE International Conference on Mobile Ad-hoc and Sensor Systems (IEEE MASS), 2004
17. Qixin Wang, **Rong Zheng**, Ajay S. Tirumala and Lui Sha, “Lightning: A Fast and Light-Weight Acoustic Location Protocol Using Low-End Wireless Micro-Sensors”, 25th IEEE International Real-Time Systems Symposium (RTSS), 2004 (nominated for best paper award)
18. **Rong Zheng**, Jennifer Hou and Lui Sha. “Asynchronous Wakeup for Ad Hoc Networks”, Proceedings of the 4th ACM international symposium on mobile ad hoc networking and computing (MobiHoc), Minneapolis, MA, June 2003.

19. **Rong Zheng** and Robin Kravets. “On-demand Power Management for Ad Hoc Networks”, Proceedings of the 22nd Annual Joint Conference of the IEEE Computer and Communications Societies (INFOCOM), San Francisco, CA, April 2003.
20. Qixin Wang, Weipeng Chen, **Rong Zheng**, Kihwal Lee and Lui Sha. “Acoustic Target Tracking Using Tiny Wireless Sensor Devices”, Proceedings of Information Processing in Sensor Networks (IPSN), Palo Alto, CA, April 2003.
21. **Rong Zheng**, Ye Ge, Jennifer Hou and Sandy R. Thuel. “A Case for Mobility Support with Temporary Home Agent”, Proceedings of International Conference on Computer Communications and Networks (IC3N), Scottsdale, AZ, October 2001.
22. Ling Su, **Rong Zheng** and Jennifer Hou. “An Active Queue Management Scheme for Internet Congestion Control and Its Application to Differentiated Services”, Proceedings of International Conference on Computer Communications and Networks (IC3N), Las Vegas, NV, October 2000.
23. Wei Lin, **Rong Zheng** and Jennifer Hou. “How to Make Assured Service More Assured”, Proceedings of 8th IEEE International Conference on Network Protocols (ICNP), Toronto, Canada, November 1999

Conference Posters

1. Xue Liu, **Rong Zheng**, Lui Sha, “Improved Timing Control for Web Server Systems Using Internal State Information”, Special Track and Poster: The 14th International World Wide Web Conference (WWW2005)
2. **Rong Zheng**, Guanghui He, Xue Liu, “Location-free Coverage Maintenance in Wireless Sensor Networks”, the Sixth ACM International Symposium on Mobile Ad Hoc Networking and Computing (MobiHoc), 2005.

In Submission

1. Richard Barton and **Rong Zheng**, “Order-optimal Data Aggregation in Wireless Sensor Networks – Part I: Regular Networks”.
2. **Rong Zheng** and Richard Barton, “Order-optimal Data Aggregation in Wireless Sensor Networks – Part II: Random Networks”.
3. Vivek Aseeja and **Rong Zheng**, MeshMan: A Management Framework for Wireless Mesh Networks

Student Advising

Ph.D. Students

- Soji Omiwade (expected graduation date: 2009)
- Jatindera Walia (“Design of Sensor Management Substrate”; expected graduation date: 2009)
- Song Wei (expected graduation date: 2010)

Master’s Students

- Joseph Jefferson (expected graduation date: Aug. 2008)
- Amit Pendharkar (expected graduation date: Aug. 2008)
- Pavan Kumar (expected graduation data: Aug. 2009)

Thesis Supervised

- Vivek Aseeja (“MeshMan: A Management Framework for Wireless Mesh Networks: Aug. 2007)
- Muqsith A. Mohammad (“Wireless Localization Based On Radio Signal Strength Mapping”, Master’s degree, Aug. 2006)
- Sumit Singhals Gupta (“ANDES: Anomaly detection in Wireless Sensor Networks”, Master’s degree, Dec. 2006)

Research Grants and Proposals

Currently Active

1. NeTS-NEDG: Toward Service Predictability under Uncertain Resource Availability in 802.11 Like Networks
Principal Investigator: Rong Zheng
Co-Investigators: none
Funding Agency: US National Science Foundation (CNS-0832084)
Amount of Grant: \$200,000
Time Period: 01/2009 – 12/2011
2. NeTS-NECO:
Principal Investigator: Rong Zheng
Co-Investigators: Gangbing Song
Funding Agency: US National Science Foundation (CNS-0832089)
Amount of Grant: \$400,000
Time Period: 09/2008 – 08/2011
3. CAREER: Data Dissemination in Multihop Wireless Networks: Theory and System Design
Principal Investigator: Rong Zheng
Co-Investigators: none
Funding Agency: US National Science Foundation (CNS-0546391)
Amount of Grant: \$400,000
Time Period: 01/2006 – 01/2011
4. DURIP: Smart Camera Network Instrumentation for Collaborative Mission Research
Principal Investigator: Shishir Sha
Co-Investigators: Rong Zheng, Edgar Gabriel, Marc Garbey
Funding Agency: Army Research Office
Amount of Grant: \$140,000
Time Period: 07/2008 – 07/2009
5. GAANN: Doctoral Training in Computer and Computational Sciences
Principal Investigator: Stephen Huang
Co-director: Ernest Leiss, Ioannis Kakadias, Yuriv Fofannov, Rong Zheng
Funding Agency: US Department of Education (P200A070377)
Amount of Grant: \$383,643
Time Period: 8/15/07-8/14/10
6. GEAR: From Chaos to Cooperation: Design of 802.11-based Wireless Community Networks
Principal Investigator: Rong Zheng
Co-Investigators: none
Funding Agency: Grants to Enhance and Advance Research (GEAR), University of Houston
Amount of Grant: \$25,000
Time Period: 09/2007 – 08/2008

Completed at University of Houston

1. ISSO: Development of a Sensor Network Research Cluster at UH: Self-Healing Wireless Smart Sensor Networks
Principal Investigator: Driss Benhaddou
Co-Investigators: Xiaojing Yuan, Deniz Gurkan, and Rong Zheng
Funding Agency: University of Houston

Amount of Grant: \$46,000
Time period: 06/2007 – 08/2007

2. ISSO: A wireless network for non-obtrusive continuous assessment of astronaut fatigue
Principal Investigator: George Zouridakis
Co-Investigators: Edgar Gabriel, Shishir Sha, Xiaojing Yuan and Rong Zheng
Funding Agency: University of Houston
Amount of Grant: \$45,000
Time period: 06/2007 – 08/2007
3. Network Laboratory On-the-Go
Principal Investigator: Rong Zheng
Co-Investigators: Deniz Gurkan, Jaspal Subhlok
Funding Agency: Office of Educational Technology and University Outreach, FDIP-B Program
University of Houston
Amount of Grant: \$25K
Time Period: 08/2006 – 08/2007
4. Wireless Location Tracking and Its Application in Hotel Management
Principal Investigator: Rong Zheng
Co-Investigators: Cary Countryman
Funding Agency: College of Hotel Management, University of Houston
Amount of Grant: \$10K
Time period: 01/2006 - 06/2006
5. Design of Distributed Algorithms in Wireless Sensor Networks
Principle Investigator: Rong Zheng
Co-investigators: none
Funding Agency: University of Houston, New Faculty Research Program
Amount of grant: \$6K
Time period: 02/01/2005 - 08/31/2005

Services

Service to Academic Discipline

- Guest editor:
 - EURASIP Journal on Advances in Signal Processing, Special issue on “wireless location estimation and tracking”
- Technical Program Committee Member:
 - (2005) First ACIS International Workshop on Self-assembling wireless networks
 - (2005) 4th International Conference on AD-HOC Networks and Wireless (AdHoc Now)
 - (2006, 2008) The International Conference on. Distributed Computing System (ICDCS)
 - (2006) Workshop on Multi-Layer Modeling and Design of Multi-Hop Wireless Networks (MLMD)
 - (2006, 2007) IFIP Networking
 - (2007, 2008, 2009) Annual Joint Conference of the IEEE Computer and Communications Societies (INFOCOM)
 - (2008) Annual IEEE Communications Society Conference on Sensor, Mesh and Ad Hoc Communications and Networks (SECON)
- Organization Committee Member:
 - (2008) IEEE International Conference On Advanced Video and Signal Based Surveillance (AVSS) (Area chair)
 - (2008) ACM International Workshop on Foundations of Wireless Ad Hoc and Sensor Networking and Computing (FOWANC) (Publicity chair)
 - (2005) First International Conference on Wireless Internet (WICON) (Publicity chair)
- Reviews include the following international journals and conferences:
 - (1999 – 2008) Annual Joint Conference of the IEEE Computer and Communications Societies (INFOCOM)
 - (2002 – 2008) International Conference on. Distributed Computing System (ICDCS)
 - (2008) Annual IEEE Communications Society Conference on Sensor, Mesh and Ad Hoc Communications and Networks (SECON)
 - (2005) First ACIS International Workshop on Self-assembling wireless networks
 - (2005) 4th International Conference on AD-HOC Networks and Wireless (AdHoc Now)
 - (2006) Workshop on Multi-Layer Modeling and Design of Multi-Hop Wireless Networks (MLMD)
 - (2006, 2007) IFIP Networking
 - (2004 – 2008) IEEE Tran. on Wireless Communications
 - (2008) IEEE Tran. on Networking
 - (2004 – 2008) IEEE Tran. on Mobile Computing
 - (2005) IEEE Tran. on Dependable and Secure Computing
 - (2006) IEEE Journal of Selected Topics in Communication
 - (2006) Mobile Computing and Communications Review
 - (2006) IEEE Tran. on Vehicular Technology

Service to the Department

- (2005) Faculty Recruiting Committee member
- (2006) Equipment Committee member, Seminar Committee member
- (2007) Seminar Committee member
- (2008) Recruiting Committee member

Service to the University

- Established connections with EE dept. Tsinghua University, CS dept. Zhejiang University. The objective is to help recruit outstanding students.
- Initiated membership of PlanetLab consortium (together with Jaspal Subhlok), i.e., a collection of academic, industrial, and government institutions cooperating to support and enhance the PlanetLab overlay network.

Invited Talks

- On providing predictable services under resource uncertainty, Washington State University, Vancouver, WA, May 2008
- On providing predictable services under resource uncertainty, Intel Research, Hillsboro, Oregon, May 2008
- Robust Resource management in wireless networks, University of Illinois at Urbana-Champaign, April 2008
- Resource management in wireless networks, Texas State at San Marcos, Jan. 2008
- Starvation modeling and predication in wireless networks, McGill University, Sept. 2007
- Presentation at NSF NeTS PI meeting, August 2006
- Data Aggregation in Wireless Sensor Network, Nokia Research, Mountainview, CA, August 2006
- Data Aggregation in Wireless Sensor Network, University of California, Davis, August 2006
- Information Dissemination in Multihop Wireless Networks, Zhejiang University, China, January 2006
- Information Dissemination in Multihop Wireless Networks, Tsinghua University, China, December 2005
- Presentations at Graduate Colloquium, Fall 2004, 2005
- Micro-Power Management in IEEE 802.11 Wireless Networks, Sharp Labs of America, WA, July 2004
- To Sleep or Not to Sleep: a Microscopic Study of Power Management in IEEE 802.11 Wireless Networks, CS Seminar Series, Illinois Institute of Technology, May 2004