

# COMPREHENSIVE PROFESSIONAL VITAE

Name: **Benyuan Liu**  
Department: Computer Science  
College: Arts and Sciences  
Rank: Assistant Professor  
Fields: Computer Networking

## A. EDUCATION AND ACADEMIC QUALIFICATIONS

### 1. Education

- 2003 Ph.D. in Computer Science  
University of Massachusetts Amherst, MA, USA  
Dissertation: *Design and Performance Modeling of Wireless Networks.*
- 1998 M.S. in Physics, Yale University, New Haven, CT, USA
- 1994 B.S. in Physics, University of Science and Technology of China, Hefei, China

### 2. Academic Experience

- 2004-present** Assistant Professor, Department of Computer Science  
University of Massachusetts Lowell
- 2003-2004 Assistant Professor, Department of Computer Science  
City College of New York

### 3. Academic Honors and Awards

- 2002 Graduate School Fellowship, University of Massachusetts Amherst  
(The highest honor from the Graduate School at UMass Amherst. Only two out of around 200 graduate students in the Computer Science Department were awarded in 2002.)
- 1994 Outstanding Graduating Student, University of Science and Technology of China.  
(The highest honor for graduating undergraduate students)

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*Dates in bold face indicate work undertaken or published since joining the University of Massachusetts Lowell.*

## **B. PROFESSIONAL ACTIVITIES**

### **1. Professional Association Participation**

- 2004 - present**      Member of Association of Computing Machinery (ACM)  
**2004 - present**      Member of Institute of Electrical and Electronics Engineers (IEEE)

### **2. Conference Program Committee Member**

(Committee members are by invitation only. Duties include reviewing submitted papers, discussing reviews, and participating in the acceptance decision process.)

- 2010**      IEEE Conference on Computer Communications (Infocom 2010)  
**2010**      International Conference on Distributed Computing Systems (ICDCS 2010)  
**2010**      International Conference on Mobile Computing and Ubiquitous Networking  
**2009**      ACM International Workshop on Foundations of Wireless Ad Hoc and Sensor Networking and Computing (FOWANC 2009)  
**2009**      IEEE International Workshop on Wireless Network Algorithm and Theory  
**2009**      International Workshop on Localized Algorithms and Protocols for Wireless Sensor Networks (LOCALGOS)  
**2009**      IEEE Conference on Computer Communications (Infocom 2009)  
**2009**      International Conference on Computer Communications and Networks (ICCCN)  
**2009**      IEEE Workshop on Information Retrieval in Sensor Networks (IRSN'09)  
**2008**      ACM International Workshop on UnderWater Networks (WUWNet), poster session  
**2008**      Chinacom - Wireless Communications and Networking Symposium  
**2008**      ACM International Workshop on Integrated Heterogeneous Sensor Networks  
**2008**      ACM International Workshop on Foundations of Wireless Ad Hoc and Sensor Networking and Computing (FOWANC 2008)  
**2008**      IEEE Conference on Computer Communications (Infocom 2008)  
**2008**      IEEE PerCom Workshop on Pervasive Wireless Networking  
**2007**      International Workshop on Theoretical and Algorithmic Aspects of Sensor and Ad-Hoc Networks (WTASA'07)  
**2007**      ACIS International Workshop on Self-Assembling Wireless Networks (SAWN07)  
**2007**      International Conference on Computer Communications and Networks (ICCCN'07)  
**2007**      International Performance Computing and Communications Conference (IPCCC'07)  
**2007**      IEEE Conference on Computer Communications (Infocom 2007)  
**2007**      IEEE PerCom Workshop on Pervasive Wireless Networking  
**2006**      International Conference on Computer Communications and Networks (ICCCN)  
**2006**      IEEE Conference on Computer Communications (Infocom 2006)  
**2006**      International Performance Computing and Communications Conference  
**2006**      The IEEE 20th International Conference on Advanced Information Networking and Applications  
**2006**      IEEE PerCom Workshop on Pervasive Wireless Networking  
**2005**      International Workshop on Resource Provisioning and Management in Sensor Networks  
**2004**      Fourth New York Metro Area Networking Workshop.

### 3. Journal Referee

- 2009** ACM Transactions on Sensor Networks, ACM Computing Surveys, IEEE Transactions on Communications, IEEE Transactions on Mobile Computing, IEEE Transactions on Parallel and Distributed Systems, IEEE Transactions on Information Theory, IEEE Journal on Selected Areas in Communications (J-SAC), IEEE Transactions on Vehicular Technologies, International Journal of Communication Systems
- 2008** ACM Transactions on Sensor Networks, ACM/IEEE Transactions on Networking, IEEE Transactions on Mobile Computing, IEEE Transactions on Parallel and Distributed Systems, IEEE Journal on Selected Areas in Communications (J-SAC)
- 2007** ACM Transactions on Sensor Networks, ACM/IEEE Transactions on Networking, IEEE Transactions on Communications, IEEE Transactions on Vehicular Technologies, Journal of Pervasive Mobile Computing
- 2006** IEEE Transactions on Mobile Computing, IEEE Transactions on Wireless Communications, Performance, Performance Evaluation, International Journal of Sensor Networks (IJSNet), International Journal of Wireless and Mobile Computing (IJWMC)
- 2005** ACM Baltzer Mobile Networks and Applications (MONET), IEEE Transactions on Communications, IEEE Transactions on Mobile Computing, IEEE Transactions on Parallel and Distributed Systems, Performance Evaluation, IEEE Journal on Selected Areas in Communications (J-SAC)

### 4. Organization Committee

- 2010** Poster and Demo Co-Chair, IEEE Infocom 2010.  
*Responsibilities:* Prepare and disseminate Call for Posters and Demo, organize evaluation committee to select posters/demos to be presented at the conference, coordinate with local arrangement committee to setup and display the posters and demos.
- 2009** TPC Co-chair, Fourth International Conference on Wireless Algorithms, Systems, and Applications (WASA 2009), Boston, August, 2009.  
*Responsibilities:* Prepare and disseminate Call for Paper, invite and confirm TPC members, coordinate paper review, select accepted papers and best paper awards, propose candidates for keynote speech, propose authors for invited papers.
- 2009** Lead Guest Editor, Special Issue for EURASIP Journal on Wireless Communications and Networking  
*Responsibilities:* Define scope of the special issue, prepare and disseminate Call for Paper, obtain reviews for the submitted manuscripts, determine accepted papers.

**2008** Track co-chair, Cross-layer Design and Optimization track, 17<sup>th</sup> International Conference on Computer Communications and Networks (ICCCN), St. Thomas Island, August, 2008.

*Responsibilities:* Prepare and disseminate Call for Paper, invite and confirm TPC members, coordinate the paper review, determine accepted papers, propose names for Distinguished Speaker, propose authors for invited papers.

**2008** Session Chair, IEEE Infocom, Phoenix, AZ, April 2008.

*Responsibilities:* Introduce the speakers for the session, ensure the session proceeds according to schedule, facilitate a dialogue between presenters and audience while maintaining a friendly and relaxed environment.

## 5. Book Reviewer for Major Academic Publishers

**2008** *Opportunistic Routing in Multihop Wireless Networks*, by Wenjing Lou, Wiley.

**2005** *Computer Networking: A Top-Down Approach Featuring the Internet*, by James Kurose, Keith Ross, Addison Wesley.

## C. Research

### 1. Grants and Contracts

#### a. External grants

**2007-2010** “NeTS-WN: Collaborative Research: Cooperative Wireless Networking: Foundations and Practice”, National Science Foundation, CNS 0721626, 2007-2010, \$150,000, PI.

#### b. Internal grants

**2007-2008** “Coordinated Multi-campus Research: The Massachusetts Center for Networked Sensing in Challenged Environments (NetSence)”, UMass President Science and Technology Initiative, 2007-2008, \$175,000 (\$10,000 for UMass Lowell), co-PI.

### 2. Academic and Professional Publications

#### a. Refereed Journal Publications

**2009** Dennis L. Goeckel, **Benyuan Liu**, Don Towsley, Liaoruo Wang, Cedric Westphal, “Asymptotic Connectivity Properties of Cooperative Wireless Ad Hoc Networks”, *IEEE Journal on Selected Areas in Communications (J-SAC)*, 2009.

**2006** Daniel R. Figueiredo, **Benyuan Liu**, Yang Guo, Jim Kurose, Don Towsley, “On the Efficiency of Fluid Simulation of Network”, *Computer Networks Journal*, pages 1974-1994, 2006.

- 2005 Daniel R. Figueiredo, **Benyuan Liu**, Anja Feldmann, Vishal Misra, Don Towsley, Walter Willinger, “On TCP and self-similar Traffic”, *Performance Evaluation Journal*, Vol 61, pages 129-141, 2005.
- 2004 Ping Ji, **Benyuan Liu**, Don Towsley, Zihui Ge and Jim Kurose, Modeling Frame-level Errors in GSM Wireless Channels, *Performance Evaluation Journal*, Vol 55, pages 165-181, 2004.
- 2002 Daniel Figueiredo, **Benyuan Liu**, Vishal Misra, Don Towsley, On the Autocorrelation Structure of TCP Traffic, *Computer Networks Journal*, Vol 40, pages 339-361, 2002.

#### **b. Refereed Conference and Workshop Publications**

(In computer networking field, conferences are highly competitive and often preferred for publications. Acceptance ratios are provided when they are available. Students authors supervised or co-supervised by Dr. Liu are shown in underlines.)

- 2009 Anwar Saipulla, Cedric Westphal, **Benyuan Liu**, Jie Wang, “Barrier Coverage of Line Based Deployed Wireless Sensor Networks”, *Proceedings of IEEE Infocom*, pages 127-135, Rio de Janeiro, Brazil, April, 2009. (acceptance ratio: 19.7%, presented by Benyuan Liu at the conference)
- 2009 Stanley Barr, **Benyuan Liu**, Jie Wang, “Underwater Barriers with Sensor Networks Using Auction Algorithms”, *IEEE International Conference on Computer Communications and Networks (ICCCN)*, San Francisco, August, 2009. (acceptance ratio: 29.5%)
- 2009 Stanley Barr, **Benyuan Liu**, Jie Wang, “Distributed Auctions for Barrier Construction”, *Proceedings of IEEE Milcom*, 2009.
- 2009 William Gauvin, **Benyuan Liu**, Xinwen Fu, Jie Wang, “Utopia: Providing Trusted Social Network Relationships within an Un-Trusted Environment”, *Workshop on Social Networks, Applications, and Systems (SNAS'09)*, pages 561-569, Boston, August, 2009. (presented by William Gauvin at the workshop)
- 2009 Guoliang Xing, Rui Tan, **Benyuan Liu**, Jianping Wang, Xiaohua Jia, Chih-wei Yi, “Data Fusion Improves the Coverage of Wireless Sensor Networks”, *Proceedings of ACM MobiCom*, Beijing, September, 2009. (acceptance ratio: 10.6%)
- 2009 Cagatay Capar, Dennis Goeckel, **Benyuan Liu**, Don Towsley, Liaoruo Wang, Cedric Westphal, “Full Connectivity and Percolation in Large Cooperative Wireless Networks”, The Third Annual Conference of the International Technology Alliance, University College, Maryland, September, 2009.

- 2009** Rui Tan, Guoliang Xing, **Benyuan Liu**, Jianping Wang, “Impact of Data Fusion on Real-Time Detection in Sensor Networks”, to appear in the 30th IEEE Real-Time Systems Symposium (RTSS), Washington, DC, December, 2009. (acceptance ratio: 21%).
- 2008** **Benyuan Liu**, Olivier Dousse, Jie Wang, Anwar Saipulla, “Strong Barrier Coverage of Wireless Sensor Networks”, *Proceedings of ACM MobiHoc*, pages 411-420, Hong Kong, China, May, 2008. (acceptance ratio: 14.6%, presented by Benyuan Liu at the conference.)
- 2008** Liaoruo Wang, **Benyuan Liu**, Dennis Goeckel, Cedric Westphal, Don Towsley, “Connectivity in Cooperative Wireless Ad Hoc Networks”, *Proceedings of ACM MobiHoc*, pages 121-130, Hong Kong, China, 2008. (acceptance ratio: 14.6%, presented by Benyuan Liu at the conference.).
- 2008** **Benyuan Liu**, Don Towsley, Anathram Swami, “Data Gathering Capacity of Large Scale Multihop Wireless Networks”, *IEEE International Conference on Mobile Ad-hoc and Sensor Systems (MASS)*, pages 124-132, Atlanta, October, 2008. (acceptance ratio: 12.4%, presented by Benyuan Liu at the conference.)
- 2008** Stanley Barr, **Benyuan Liu**, Jie Wang, “Barrier Coverage For Underwater Sensor Networks”, *Proceedings of IEEE Milcom*, pages 1-7, San Diego, November, 2008.
- 2008** Anwar Saipulla, **Benyuan Liu**, Jie Wang, “Barrier Coverage with Airdropped Wireless Sensors”, *Proceedings of IEEE Milcom*, pages 1-7, San Diego, November, 2008.
- 2007** **Benyuan Liu**, Patrick Thiran, Don Towsley, “Capacity of a Wireless Ad Hoc Network with Infrastructure”, *Proceedings of ACM MobiHoc*, pages 239-246, Montreal, September, 2007. (acceptance ratio: 18.5%, presented by Benyuan Liu at the conference.).
- 2007** Liaorou Wang, **Benyuan Liu**, Dennis Goeckel, Don Towsley, Cedric Westphal, “Connectivity with Noncoherent Cooperation in Extended Wireless Networks”, The Second Annual Conference of the International Technology Alliance, 2007.
- 2006** Qunfeng Dong, Suman Banerjee, **Benyuan Liu**, “Throughput Optimization and Fair Bandwidth Allocation in Multi-hop Wireless LANs”, *IEEE Infocom*, pages 1-12, Barcelona, Spain, April, 2006. (acceptance ratio: 18%).
- 2005** **Benyuan Liu**, Peter Brass, Olivier Dousse, Philippe Nain, Don Towsley, “Mobility Improves Coverage of Sensor Networks”, *Proceedings of ACM MobiHoc*, pages 300-308, Urbana-Champaign, May, 2005. (acceptance ratio: 14.2%, presented by Benyuan Liu at the conference.).

- 2005 Philippe Nain, Don Towsley, **Benyuan Liu**, Zhen Liu, "Properties of Random Direction Models", *IEEE Infocom*, pages 1897-1907, Miami, April, 2005. (acceptance ratio: 17.2%, presented by Benyuan Liu at the conference.).
- 2004 **Benyuan Liu**, Don Towsley, "A study on the Coverage of Large-scale Sensor Networks", *IEEE International Conference on Mobile Ad-hoc and Sensor Systems (MASS)*, pages 475-483, Fort Lauderdale, October, 2004. (acceptance ratio: 25.1%, presented by Benyuan Liu at the conference.).
- 2004 X. Liu, K. Ravindran, **Benyuan Liu**, and D. Loguinov, "Single-Hop Probing Asymptotics in Available Bandwidth Estimation: Sample-Path Analysis", *ACM Internet Measurement Conference (IMC)*, pages 300-313, Taormina, Sicily, Italy, October, 2004. (acceptance ratio: 24.8%)
- 2003 **Benyuan Liu**, Zhen Liu, Don Towsley, "On the Capacity of Hybrid Wireless Networks", *IEEE Infocom*, pages 1543- 1552, San Francisco, April, 2003. (acceptance ratio: 20.8%, presented by Benyuan Liu at the conference.)
- 2003 **Benyuan Liu**, Don Towsley, "On the Coverage and Detectability of Large-Scale Wireless Sensor Networks", *Workshop on Modeling and Optimization in Mobile, Ad Hoc and Wireless Networks*, INRIA Sophia-Antipolis, France, March, 2003. (presented by Benyuan Liu at the conference.)
- 2002 **Benyuan Liu**, Dennis Goeckel, Don Towsley, "TCP-Cognizant Adaptive Forward Error Correction in Wireless Networks", *Proceedings of IEEE Global Telecommunications Conference, Global Internet Symposium*, pages 2128-2132, Taipei, November, 2002. (acceptance ratio: 19.7%, presented by Benyuan Liu at the conference.)
- 2002 Ping Ji, **Benyuan Liu**, Don Towsley, Jim Kurose, "Modeling Frame-level Errors in GSM Wireless Channels", *Proceedings of IEEE Globecom, Internet Performance Symposium*, pages 2483-2487, Taipei, November, 2002. (acceptance ratio: 19.7%)
- 2001 **Benyuan Liu**, Daniel Figueiredo, Yang Guo, Jim Kurose, Don Towsley, "A Study of Networks Simulation Efficiency: Fluid Simulation vs. Packet-level Simulation", *Proceedings of IEEE Infocom*, pages 1244-1253, Anchorage, April, 2001. (acceptance ratio: 23.1%, presented by Benyuan Liu at the conference.).
- 1999 **Benyuan Liu**, Yang Guo, Jim Kurose, Don Towsley, Weibo Gong, "Fluid Simulation of Large Scale Networks: Issues and Tradeoffs", *Proceedings of International Conference on Parallel and Distributed Processing Techniques and Applications (PDPTA)*, Las Vegas, June, 1999. (presented by Benyuan Liu at the conference.)

### c. Edited Book

- 2009**      **Benyuan Liu**, Azer Bestavros, Ding-Zhu Du, Jie Wang, “Wireless Algorithms, Systems, and Applications”, Lecture Notes on Computer Science (LNCS) 5682, Springer, 2009.

### 3. Other Research or Creative Activities

#### a. Invited external talks

- 2008**      *Research in Computer Networking*, Department of Computer Science, City University of Hong Kong, China.
- 2007**      *Cooperative Connectivity in Wireless Ad hoc Networks*, Department of Computer Science Colloquium, University of Connecticut, Storrs, CT.
- 2007**      *Capacity of wireless ad hoc networks with infrastructure*, Department of Electrical and Computer Engineering Colloquium, Worcester Polytechnic Institute, Worcester, MA.
- 2005**      *Coverage of Wireless Sensor Networks*, University of Massachusetts, Department of Computer Science Colloquium, University of Massachusetts Dartmouth, Dartmouth, MA.

## D. INSTRUCTION RELATED ACTIVITIES

### 1. Teaching

#### a. Courses taught at UMass Lowell

Semester	Number	Course Title	Enrollment	Level
Fall 2009	91.563	Data Communications I	29	Graduate
Fall 2009	91.201	Computing III	33	Undergraduate
Spring 2009	91.564	Data Communications II	12	Graduate
Fall 2008	91.563	Data Communications I	27	Graduate
Fall 2008	91.404	Analysis of Algorithms	15	Undergraduate
Spring 2008	91.580	Topics in Compute Science	5	Graduate
Spring 2008	91.564	Data Communications II	24	Graduate
Spring 2008	91.414	Data Communications II	4	Undergraduate
Fall 2007	91.413	Data Communications I	9	Undergraduate
Fall 2007	91.563	Data Communications I	23	Graduate
Spring 2007	91.564	Data Communications II	16	Graduate
Fall 2006	91.563	Data Communications I	14	Graduate
Fall 2006	91.570	Wireless Sensor Networks*	9	Graduate
Spring 2006	91.564	Data Communications II	15	Graduate

Fall 2005	91.563	Data Communications I	18	Graduate
Spring 2005	91.562	Data Communications II	21	Graduate
Fall 2004	91.564	Data Communications I	25	Graduate

\*Wireless Sensor Networks is a new graduate course I developed and taught in Fall 2006.

**b. Courses taught at previous institutions**

2003-2004 Computer Networks, Undergraduate, City College of New York  
2003 Wireless Sensor Networks, Graduate, co-organized with UMass Amherst

**2. Other Activities and Accomplishments Related to the Instructional Function**

**a. Doctoral Dissertation Advisor**

**2007-2009** Stanley Barr (co-advised with Prof. Jie Wang)  
Dissertation: Constructing Underwater Sensor Based Barriers Using Distributed Auctions  
Completed in May, 2009, currently employed at MITRE Corporation, Bedford, MA.

**2008-present** William Gauvin, University of Massachusetts Lowell  
Dissertation Topic: Measurement and Analysis of Online Social Networks  
Expected to graduate in 2011.

**2008-present** Harshavardhan Achrekar, University of Massachusetts Lowell  
Dissertation Topic: Search in Online Social Networks  
Expected to graduate in 2011.

**2006-present** Anwar Saipulla, University of Massachusetts Lowell  
Dissertation Topic: Barrier Coverage of Wireless Sensor Networks  
Expected to graduate in 2010.

**b. Master Thesis Advisor**

**2007** Sean Casey, M.S., University of Massachusetts Lowell  
Thesis: Design of a Small Form Factor and High-frequency Wireless Sensor Data Acquisition and Logging System  
Completed in May, 2007, currently employed at BAE Systems, Nashua, NH

**b. Thesis Committee Member**

**2009** Sania Salahuddin, Ph.D., University of Massachusetts Lowell  
Thesis: Statistical Characterization of an Indoor UWB Channel  
Committee Chair: Charles Thompson

- 2008** Zhi Yang, M.S., University of Massachusetts Lowell  
Thesis: A Holistic Stack-Protection Approach on TinyOS Sensor Node  
Committee Chair: Li Xu
- 2008** Zhijun Yu, D.Sc., University of Massachusetts Lowell  
Thesis: Fault-tolerant Sensor Coverage for Achieving Desired Coverage  
Lifetime with Minimum Cost  
Committee Chair: Jie Wang
- 2008** Prabhu Govindaswamy, M.S., University of Massachusetts Lowell  
Thesis: Early Results on Multi-model Sensor Surveillance Applications  
Committee Chair: Guanling Chen
- 2007** Chunyan Du, M.S., University of Massachusetts Lowell  
Thesis: A Study on Wireless Network Security  
Committee Chair: Jie Wang
- 2007** Homayara Akter, M.S., University of Massachusetts Lowell  
Thesis: Monitoring and Analyzing Outdoor Wireless Networks  
Committee Chair: Guanling Chen
- 2006** Ning Zhong, D.Sc., University of Massachusetts Lowell  
Thesis: Minimum-cost Sensor Placement with a Given Lifetime  
Requirement  
Committee Chair: Jie Wang
- 2006** Chun-Yin Liu, M.S., University of Massachusetts Lowell  
Thesis: Experimental Performance Evaluation of Wireless Local Area  
Networks Using Machine Learning  
Committee Chair: Gary Livingston
- 2005** Keyurkumar Joshi, M.S., University of Massachusetts Lowell  
Thesis: TCP Performance Emulation for Lossy Communication Channels  
Committee Chair: Kavitha Chandra
- 2004** Xiliang Liu, Ph.D., City University of New York (CCNY)  
Thesis: A Theory for End-to-end Available Bandwidth Estimation  
Committee Chair: Kaliappa Ravindran (City University of New York)  
(I started to collaborate with Professor Ravindran and his Ph.D. student  
Xiliang Liu when I was at CCNY. The collaboration continued after I  
joined UMass Lowell. A conference paper was published as a result of the  
collaboration.)

## **E. SERVICE ACTIVITIES**

### **1. Service to the Department**

<b>2009-present</b>	Coordinator of Department Colloquium
<b>2006-present</b>	Member of Graduate Committee
<b>2007-2008</b>	Member of Nomination Committee
<b>2008</b>	Accepted Student Registration, Department of Computer Science
<b>2008</b>	Member of Ad hoc Committee to Evaluate Doctoral Qualifier Exams
<b>2007</b>	Accepted Student Registration, Department of Computer Science
<b>2005-2006</b>	Member of Operations Committee

### **2. Service to the University**

<b>2007</b>	Demonstration in Open House, College of Arts and Sciences
<b>2006</b>	Accepted Student Registration, Department of Computer Science
<b>2006</b>	Demonstration in Open House, College of Arts and Sciences
<b>2005</b>	Accepted Student Reception, College of Arts and Sciences

### **3. Service to the Community**

<b>2009</b>	Chair of Award Committee, Graduate Student's Research Symposium, Department of Computer Science, UMass Boston
<b>2006</b>	Mentor of two students (Sean Casey and Zhong-Hong Huang) for the NSF ISET program, University of Massachusetts Lowell