

Zizhan Zheng

The Ohio State University
Columbus, OH 43210

(614) 312-3013
zhengz@cse.ohio-state.edu

EDUCATION

- 09/2005 - present **Ph.D. Candidate**, Dept. of Computer Science and Engineering, The Ohio State University
Advisor: Dr. Prasun Sinha
Cumulative GPA 3.97/4.00
- 09/2002 - 07/2005 **M.S.**, Dept. of Computer Science, Peking University, China
Advisor: Dr. Qianxiang Wang
GPA 3.7/4.0
- 09/1998 - 07/2002 **B.E.**, Dept. of Polymer Science and Engineering, Sichuan University, China
GPA 3.8/4.0, ranking 1st among 106 students

RESEARCH INTEREST

Wireless Networking and Sensor Networks

PROFESSIONAL EXPERIENCE

- 01/2008 - present **Research Assistant** CSE, The Ohio State Univ.
Working on geographic routing and coverage in sensor networks, and roadside WiFi networks.
- 09/2005 - 08/2006 **Graduate Fellow** CSE, The Ohio State Univ.
Working on network coding for wireless networks.
- 09/2002 - 07/2005 **Research Assistant** CS, Peking Univ., China
Graduate research assistant at PKU-Bell Labs Software Technologies Joint Lab. Designed and implemented a dynamic clustering service for PKUAS, an architecture-based reflective J2EE application server.

TEACHING EXPERIENCE

- 09/2006 - 12/2007 **Teaching Assistant** CSE, The Ohio State Univ.
Lab instructor for *Computer Assisted Problem Solving for Business*

PUBLICATIONS

Conferences

1. Paul N. Balister, Zizhan Zheng, Santosh Kumar and Prasun Sinha, "Trap Coverage: Allowing Coverage Holes of Bounded Diameter in Wireless Sensor Networks," *Proc. of IEEE INFOCOM*, 2009.
2. Zizhan Zheng, Prasun Sinha and Santosh Kumar, "Alpha Coverage: Bounding the Interconnection Gap for Vehicular Internet Access," *Proc. of IEEE INFOCOM Mini-Conference*, 2009.
3. Kai-Wei Fan, Zizhan Zheng and Prasun Sinha, "Steady and Fair Rate Allocation for Rechargeable Sensors in Perpetual Sensor Networks," *Proc. of ACM SENSYS*, Raleigh, NC, Nov. 2008.
4. Zizhan Zheng, Kai-Wei Fan, Prasun Sinha and Yusu Wang, "Distributed Roadmap Aided Routing in Sensor Networks," *Proc. of IEEE MASS*, short paper, Atlanta, GA, Sep. 2008.

5. Zizhan Zheng and Prasun Sinha, "XBC: XOR-based Buffer Coding for Reliable Transmissions over Wireless Networks," *Proc. of IEEE BROADNETS*, Raleigh, NC, Sep. 2007.
6. Gang Huang, Tiancheng Liu, Hong Mei, Zizhan Zheng, Zhao Liu, and Gang Fan, "Towards Autonomic Computing Middleware via Reflection," *Proc. of COMPSAC*, Hong Kong, Sep. 2004.

Journals

1. Zizhan Zheng and Prasun Sinha, "Buffer Coding for Reliable Transmissions over Wireless Networks," *Elsevier Computer Communications (COMCOM)*, 32 (1), pp. 111-123, Jan. 2009 (Extended Version of BROADNETS 2007 paper).

COURSE WORK

- Computer Science: Analysis of Algorithms, Computability and Unsolvability, Computer Architecture, Operating Systems, Programming Languages, Computational Geometry, Data Grid Computing, Introduction to Network Security, Next Generation Wireless Networks, Advanced Database Techniques, Parallel Computing, Petri Nets, Advanced Software Engineering
- Mathematics: Abstract Algebra, Elementary Topology, Probability for Statistical Inference, Theory of Statistical Analysis

HONORS AND AWARDS

- SenSys'08 Travel Grant
- 2003 "May 4th" Scholarship awarded by Peking University
- 2001 Outstanding Student Award of Sichuan University, First Class
- 2000 Outstanding Student Award of Sichuan University, First Class
- 1999 Rohm and Haas Scholarship

RECENT RESEARCH PROJECTS

- **Intermittent Coverage for Mobile Users**
Vehicular Internet access via open WLAN access points (AP) has been demonstrated to be a feasible solution to provide opportunistic data service to moving vehicles. Using an in situ deployment, however, such a solution does not provide worstcase performance guarantees due to unpredictable intermittent connectivity. On the other hand, a solution that tries to cover every point in an entire road network with APs (a full coverage) is not very practical due to the prohibitive deployment and operational cost. We therefore introduce a new notion of intermittent coverage for mobile users, called Alpha Coverage, which provides worst-case guarantees on the interconnection gap while using significantly fewer APs than full coverage. Our approach can also be used to supplement open WLAN APs in a region with appropriate number of additional APs that will provide worst-case guarantees on interconnection gap.
- **Tracking Movements Using a Sparse Sensor Network**
Tracking of movements such as that of people, animals, vehicles, or of phenomena such as fire, can be achieved by deploying a wireless sensor network. Real-life deployments, however, will be at large scale and achieving this scale will become prohibitively expensive if we require every point in the region to be covered (i.e., full coverage), as has been the case in prototype deployments. We therefore propose a new mode of coverage called Trap Coverage that scales well with large deployment regions. A sensor network providing Trap Coverage guarantees that any moving object or phenomena can move only a (known) bounded displacement before it is guaranteed to be detected by the network for any trajectory and speed. Tracking applications aside, the model of trap coverage generalizes the de-facto model of full coverage itself, by allowing for holes of a given maximum diameter.