

# Shuhui (Grace) Yang, PhD

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## 1 Research Interests

Distributed systems, distributed and localized algorithms, networking, wireless ad hoc and sensor networks, wireless security, cyber physical systems.

## 2 Education and Work Experiences

- Rensselaer Polytechnic Institute, Troy, NY.  
Postdoctoral Research Associate, August 2007 - Present.
- Florida Atlantic University, Boca Raton, FL.  
Ph.D. in Computer Science, August 2007.
- Nanjing University, Nanjing, China.  
M.S. in Computer Science, July 2003.
- Jiangsu University, Zhenjiang, China.  
B.S. in Computer Engineering, July 2000.

## 3 Honors and Awards

- **Best paper award** of the 2nd IEEE International Conference on Mobile Ad-hoc and Sensor Systems (MASS), November 2005.
- 1st prize of the 2nd IEEE Graduate Student Research Showcase, Florida Atlantic University, April 2006.
- Student Travel Grants from IEEE Conferences (MASS, SECON, et al.), 2004 - 2007.

## 4 Teaching Experience

- 92846 Special Topics on Wireless Ad Hoc Networks, the Department of Computer Science, Rensselaer Polytechnic Institute, Spring 2008.
- COT4400 Design & Analysis of Algorithms, the Department of Computer Science and Engineering, Florida Atlantic University, Fall 2005, Summer 2006, and Spring 2007.
- COT 3002 Foundations of Computer Science, the Department of Computer Science and Engineering, Florida Atlantic University, Summer 2007.

## 5 Grant Application Participation

- Location Identification in Wireless Networks with the Presence of Adversaries (NSF grant, under preparation, PI: Dr. Wei Zhao, CO-PI: Dr. Shuhui Yang)

Made significant contributions to the following grant proposals:

- Dynamic Carrier-Assisted Routing in Mobile Networks (NSF grant CNS 0626240, PI: Dr. Jie Wu)
- Efficient and Localized Broadcasting in Ad Hoc Networks (NSF grant CNS 0434533, PI: Dr. Jie Wu)

## 6 Professional Activities and Services

- IEEE member.
- Panelist of NSF NeTs and CRI, June & Dec., 2008.
- Guest editor for “Wireless Network” Special Issue in EURASIP Journal on Wireless Communications and Networking.
- Member of Colloquium Committee of CS Dept., Rensselaer Polytechnic Institute, Fall 2008.
- Program Committee member of the 28th International Conference on Distributed computing Systems (ICDCS’08).
- Program Committee member of the First International Workshop on Wireless Security and Privacy (WiSP’08), in conjunction with the 28th International Conference on Distributed Computing Systems (ICDCS’08).
- Reviewer of IEEE INFOCOM 2008, IEEE Transactions on Wireless Communication, IEEE Transaction on Parallel and Distributed Systems, IEEE Transactions on Mobile Computing, Journal of Parallel and Distributed Computing, Journal of Ad Hoc Networks, IEEE RTAS 2008, IET communications, and IEEE JSAC Special Issue on Game Theory in Communication Systems, et al.
- Invited talk at the Department of Computer Science, University of Massachusetts, Lowell, on November 28, 2007.
- Vice president of the Chinese Students and Scholars Association at Florida Atlantic University, 2004-2005.

## 7 Publication

### 7.1 Journal Publications

1. **S. Yang**, J. Wu, and F. Dai “Efficient Directional Network Backbone Construction in Mobile Ad Hoc Networks”, *IEEE Transactions on Parallel and Distributed Systems*, accepted to appear.

2. **S. Yang**, Minglu Li, and J. Wu, “Scan-Based Movement-Assisted Sensor Deployment Methods in Wireless Sensor Networks”, *IEEE Transactions on Parallel and Distributed Systems*, July 2007.
3. J. Wu and **S. Yang**, “Logarithmic Store-Carry-Forward Routing in Mobile Ad Hoc Networks”, *IEEE Transactions on Parallel and Distributed Systems*, June 2007.
4. **S. Yang**, F. Dai, M. Cardei, J. Wu, and F. Patterson “On Connected Multiple Point Coverage in Wireless Sensor Networks”, accepted to appear in *International Journal of Wireless Information Networks*. **(Cited by 14.)**
5. J. Wu, F. Dai, and **S. Yang**, “Iterative Local Solutions for Connected Dominating Set in Ad Hoc Wireless Networks”, accepted to appear in *IEEE Transactions on Computers*.
6. J. Wu, M. Cardei, F. Dai, and **S. Yang**, “Extended Dominating Set and Its Applications in Ad Hoc Networks Using Cooperative Communication”, *IEEE Transactions on Parallel and Distributed Systems*, Vol. 17, No. 8, August 2006.
7. M. Cardei, J. Wu, and **S. Yang**, “Topology Control in Ad Hoc Wireless Networks using Cooperative Communication”, *IEEE Transactions on Mobile Computing*, Vol. 55, No. 3, March 2006, 334-347. **(Cited by 9.)**
8. J. Wu and **S. Yang**, “Energy-Efficient Node Scheduling Models in Sensor Networks with Adjustable Ranges”, *International Journal of Foundations of Computer Science*, Vol. 16, No. 1, 2005 3-17.
9. M. Cardei, J. Wu, and **S. Yang**, “Algorithms for Fault-Tolerant Topology in Heterogeneous Wireless Sensor Networks”, accepted to appear in *IEEE Transactions on Mobile Computing*.
10. J. Wu and **S. Yang**, “Optimal Movement-Assisted Sensor Deployment and Its Extensions in Wireless Sensor Networks”, accepted to appear in *the special issue of Esveir Science: Simulation Modelling, Practice and Theory on Performance Modelling, Analysis and Design of Wired and Wireless Networks and Protocols*.
11. **S. Yang** and J. Wu, “Backbone Construction Using Network Coding and Directional Antennas in MANETs”, submitted to *IEEE Transactions on Parallel and Distributed Systems*.

## 7.2 Refereed Conference Proceedings

1. J. Wu and **S. Yang**, “SMART: A Scan-based Movement Assisted Sensor Deployment Method in Wireless Sensor Networks”, *Proc. of IEEE INFOCOM (Acceptance rate 17%)*, March 2005. **(Cited by 49.)**
2. **S. Yang**, J. Wu, and J. Cao, “Connected k-Hop Clustering in Ad Hoc Networks”, *Proc. of the International Conference on Parallel Processing (ICPP) (Acceptance rate 28.6%, 69/241)*, June 2005. **(Cited by 20.)**
3. J. Wu and **S. Yang**, “Polylogarithmic Store-Carry-Forward Routing using Mobile Nodes”, accepted by MASS 2008 as an extended paper (Acceptance rate 5%), **(one of the four papers nominated for the best paper award)**.

4. **S. Yang**, F. Dai, M. Cardei, and J. Wu, "On Multiple Point Coverage in Wireless Sensor Networks", *Proc. of the 2nd IEEE International Conference on Mobile Ad-hoc and Sensor Systems (MASS) (Acceptance rate 17%)*, November 2005. **(Received the best paper award.) (Cited by 17.)**
5. **S. Yang**, J. Wu, and M. Cardei, "Efficient Broadcast in MANETs Using Network Coding and Directional Antennas", *Proc. of IEEE INFOCOM*, April 2008.
6. J. Wu, **S. Yang**, and M. Cardei, "On Maintaining Sensor-Actor Connectivity in Wireless Sensor and Actor Networks", *Proc. of IEEE INFOCOM*, April 2008.
7. **S. Yang**, J. Wu, and F. Dai, "Efficient Backbone Construction Methods in MANETs using Directional Antennas", *Proc. of IEEE ICDCS (Acceptance rate 13.4%, 71/528)*, June 2007.
8. M. Cardei, J. Wu, and **S. Yang**, "Fault-Tolerant Topology Control for Heterogeneous Wireless Sensor Networks", accepted by MASS 2008 (Acceptance rate 25%).
9. J. Wu and **S. Yang**, "Localized Movement-Assisted Sensor Deployment in Wireless Sensor Networks", *Proc. of WiMa workshop of the 3rd IEEE International Conference on Mobile Ad-hoc and Sensor Systems (MASS) (Acceptance rate 24%)*, October 2006.
10. J. Wu and **S. Yang**, "Optimal Movement-Assisted Sensor Deployment and Its Extensions in Wireless Sensor Networks", *Proc. of 20th International Conference on Parallel and Distributed Systems (ICPADS)*, July 2006.
11. J. Wu, F. Dai, and **S. Yang**, "Iterative Local Solutions for Connected Dominating Set in Ad Hoc Wireless Networks", *Proc. of the 2nd IEEE International Conference on Mobile Ad-hoc and Sensor Systems (MASS)*, November 2005.
12. J. Wu, M. Cardei, F. Dai, and **S. Yang**, "Extended Dominating Set in Ad Hoc Networks Using Cooperative Communication", *Proc. of IFIP Networking 2005 (poster paper)*, June 2005.
13. M. Cardei, J. Wu, and **S. Yang**, "Topology Control in Ad Hoc Wireless Networks with Hitch-hiking", *Proc. of IEEE Communications Society Conference on Sensor and Ad Hoc Communications and Networks (SECON) (Acceptance rate 27%)*, 2005.
14. J. Wu and **S. Yang**, "Coverage and Connectivity in Sensor Networks with Adjustable Ranges", *Proc. of 2004 International Workshop on Mobile and Wireless Networking (MWN) (in conjunction with ICPP)*, August 2004.
15. M. Cardei, J. Wu, and **S. Yang**, "Low Power Hitch-hiking Broadcast in Ad Hoc Wireless Networks", *Proc. of NSF Workshop on Theoretical and Algorithmic Aspect of Ad Hoc Wireless Networks*, June 2004.
16. **S. Yang** and J. Wu, "A Performance Comparison Study of a Coverage-Preserving Node Scheduling Scheme and Its Enhancement in Sensor Networks", Technique Report, CSE Dept. Florida Atlantic University, Jan. 2005.
17. **S. Yang**, W. Li, and W. Zhao, "New Routing Schemes for Switch-Based In-Vehicle Networks", Technique Report, CS Dept. Rensselaer Polytechnic Institute, Oct. 2008.

18. **S. Yang**, W. Li, and W. Zhao, “On Routing Schemes for Switch-Based In-Vehicle Networks”, submitted for publication.
19. W. Li, **S. Yang**, and W. Zhao, “Performance Analysis of Routing Schemes for Low-Cost Switch-Based In-Vehicle Networks”, submitted for publication.

### 7.3 Book Chapter

1. **S. Yang** and J. Wu, “New Technologies of Multicasting in MANET”, *Design and Analysis of Wireless Networks*, Y. Pan and Y. Xiao (eds.), Nova Science Publishers, 2005.

### 7.4 Other Publications

1. T. Gu, **S. Yang**, S. Lu, and D. Chen. “The Research of Admission Control in a Distributed Video Services System”, *Computer Application and Software*, accepted. (in Chinese)
2. **S. Yang**, T. Gu, M. Wu, and D. Chen. “Key Issues of Video Services in a Wireless Environment”, *Computer Science*, No.2, 2003. (in Chinese)
3. T. Gu, **S. Yang**, S. Lu, and D. Chen. “The Design and Distribution Technology of Web Cache System”, *Computer Science*, No.12, 2002. (in Chinese)
4. M. Wu, X. Zhang, **S. Yang**, and D. Chen. “From Distributed Objects to Web Services”, *Computer Science*, No.11, 2002. (in Chinese)

## 8 Other Experience

### 8.1 Research Assistant

- Wireless and Sensor Networking Laboratory (NSF grant CNS 0422762), Dept. of Computer Science and Engineering, Florida Atlantic University, 2003-2007.
- The research and development of the large-scale platform for multimedia services based on multi-servers. Jiangsu Provincial High Technology Project Foundation, Dept. of Computer Science and Engineering, Nanjing University, China, 2002.
- The technology of the function, management and scheduling of the application server (Contract number: 2001AA113050). A project supported by the Hi-Tech research and development program of China, Dept. of Computer Science and Engineering, Nanjing University, 2001.

### 8.2 Teaching Assistant

- COP2220, Introduction to Programming in C Laboratory, CSE dept. Florida Atlantic University, Fall 2004, Spring 2005, and Fall 2006.
- CDAC3201 & CDAC3331, Logic Design & Microprocessor Laboratory, CSE dept. Florida Atlantic University, Fall 2003 and Spring 2004.

- CDA4500, Introduction to Data Communications, CSE dept. Florida Atlantic University, Fall 2003.
- Principles of Computer Architecture, Nanjing University, China, 2001

## 9 Presentations

- “Efficient Broadcast in MANETs Using Network Coding and Directional Antennas”, *Proc. of IEEE INFOCOM*, Phoenix, Arizona, April 2008.
- “On Maintaining Sensor-Actor Connectivity in Wireless Sensor and Actor Networks”, *Proc. of IEEE INFOCOM*, Phoenix, Arizona, April 2008.
- “Coverage and Connectivity in Sensor Networks with Adjustable Ranges”, *2004 International Workshop on Mobile and Wireless Networking (MWN) (in conjunction with ICPP)*, Montreal, Canada, August 2004.
- “Topology Control in Ad Hoc Wireless Networks with Hitch-hiking”, *IEEE Communications Society Conference on Sensor and Ad Hoc Communications and Networks (SECON)*, Santa Clara, California, October 2005.
- “On Multiple Point Coverage in Wireless Sensor Networks”, *the 2nd IEEE International Conference on Mobile Ad-hoc and Sensor Systems (MASS)*, Washington D. C., November 2005.
- “Optimal Movement-Assisted Sensor Deployment and Its Extensions in Wireless Sensor Networks”, *the 20th International Conference on Parallel and Distributed Systems (ICPADS)*, Minneapolis, Minnesota, July 2006.
- “Localized Movement-Assisted Sensor Deployment in Wireless Sensor Networks”, *the WiMa workshop of the 3rd IEEE International Conference on Mobile Ad-hoc and Sensor Systems (MASS)*, Vancouver, Canada, October 2006.
- “Efficient Backbone Construction Methods in MANETs using Directional Antennas”, *IEEE ICDCS*, Toronto, Canada, June 2007.