

# Yuan Yuan

[yuanyuan@cs.umd.edu](mailto:yuanyuan@cs.umd.edu)  
[www.cs.umd.edu/~yuanyuan](http://www.cs.umd.edu/~yuanyuan)  
☎ 240-205-5677

A.V. Williams Building, Computer Science Department  
University of Maryland, College Park, MD, 20770, USA

## Education

<b>Ph.D in Computer Science</b> University of Maryland, College Park <i>Advisor: Dr. William Arbaugh</i> <i>Co-Advisor: Dr. Ashok Agrawala</i>	2003-current
<b>M.S. in Computer Science</b> University of Maryland, College Park <i>Advisor: Dr. William Arbaugh</i>	2001-2003 GPA: 3.75/4
<b>Bachelor of Computer Science &amp; Engineering</b> Special Class for Gifted Young Southeast University, China <i>Advisor: Dr. Guangxin Wu</i>	1995-1999 GPA: 3.80/4

## Research Interests:

Wireless networking, distributed systems, cognitive radio systems, ubiquitous computing, network security, sensor networks

## Awards

1. IEEE DySpan Travel Award sponsored by NSF, 2007
2. NSF Grace Hopper Scholarship, 2006
3. Department Scholarship for Grace Hopper Conference, 2006
4. Department Travel Award for Globecom Conference, 2002
5. Science and Technology Progress Awards by Ministry of Education, China, 1999
6. First-Class Academic Scholarship, first rank (< 5%), 1995~1999
7. International Mathematical Contest on Modeling, Honorable Mention, 1997

## Relevant Graduate Courses

Computer and Network Security, Cryptography, Advanced Topics in Network Security, Advanced Topics in Computer Systems, Parallel Algorithms, Advanced Topics in Programming Languages, Numerical Analysis, Scientific Computing, Bioinformatics and High-Performance Computing, Introduction to Human-Computer Interaction

## Research Experience

**Microsoft Research, Redmond, WA** (July 2006 –April 2007)  
Networking Research Group, Communication and Collaboration Group,  
Wireless Incubation Group  
*Research Intern*

- Led and Managed the research project on building cognitive radio and networking technologies

- Proposed the framework that tightly couples the spectrum allocation and the medium access control to efficiently use the unoccupied frequencies in the TV bands
  - **Patent technology:** Spectrum Allocation and Medium Access Control for Cognitive Radio Networks
  - **Patent technology:** Collaborative sensing in cognitive radio networks
  - The proposed notion of dynamic spectrum allocation is radically different from the existing schemes based on the fixed channelization. This notion changes the fundamentals of the fixed channels, which has been widely adopted in the current wireless networks
- Integrated the physical-layer design of cognitive radios with upper layers, and contributed to the first-phase prototype of the cognitive radio system

**Maryland Information and System Security Laboratory** (October 2004 – July 2006)  
 Dept. of Computer Science, University of Maryland, College Park  
*Graduate Research Assistant*

- Proposed the scalable and resilient solutions to wireless networks
  - The proposed MAC design takes the two-tier approach to support various user populations and improve the MAC-layer efficiency.
  - Proposed ROMER, resilient opportunistic mesh routing protocol. The design builds a runtime, forwarding mesh on a per-packet basis to improve the resilience against channel outages, errors, and attacks.
- Identified the cross-layer coordination issues and studied their impacts on throughput and queue stability in mesh networks
  - Built the wireless mesh network testbed with about 20 wireless nodes.

**Intel Research, Hillsboro, OR** (May 2004 – October 2004)  
*Research Intern*

- Worked on the MAC-layer proposal for IEEE 802.11s, wireless mesh networks
  - **Patent technology:** Region-based opportunistic admission control for wireless mesh networks
  - **Patent technology:** QoS management to support multimedia applications in wireless mesh networks
- Studied the WiMAX technology

**Mitsubishi Electric Research Laboratories, Boston, MA** (May 2003 – May 2004)  
*Research Intern*

- Worked on the complete MAC-layer proposal for the 802.11n wireless LAN
  - Surveyed a wide range of the MAC technologies including 802.11b/e, HiperLAN/2, GSM, 802.15, Zigbee, 802.16
  - Implemented and evaluated the IEEE 802.11e MAC design in OPNET simulator
  - **Patent technology:** adaptive distributed channel access for wireless LANs
  - **Patent technology:** sequential controlled channel access for wireless LANs
- Worked the MAC-layer proposal to IEEE 802.15.3a WPAN
  - Proposed the mechanism called “proportional channel time partition” to handle the rate diversity in the Piconet
- Proposed resource management and scheduling algorithms for multi-rate wireless LANs
  - **Patent technology:** MWFS: Multirate Wireless Fair Scheduling for wireless LANs

**Maryland Information and System Security Laboratory** (May 2002 – May 2003)  
*Graduate Research Assistant*

- Worked on the project to provide the secure routing in wireless ad-hoc networks

- Proposed a dynamic discovery protocol to securely search for services in wireless ad-hoc networks
- Designed and constructed the IP telephony testbed for MISSL, set up IP Gateway to PSTN, Gatekeeper, Billing/Accounting System
- Studied on the security issues in the VoIP applications by integrating Firewall with IP-telephony

**Network and Information Research Lab,**  
Southeast University, China

(February 2000 – May 2002)

*Graduate Research Assistant, Software Engineer*

- Designed and constructed the VPN system for the Nanjing Network Center, China
- Implemented the IP security module according to the network security protocols in the Linux platform
- Implemented and improved the key generation and management methods for the VPN clients
- Network Administrator of the Nanjing Network Center, China

### Selected Publications

1. Yuan Yuan, Paramvir Bahl, Ranveer Chandra, Thomas Moscibroda, Yunnan Wu, **Allocating Dynamic Time-Spectrum Blocks in Cognitive Radio Networks**, IEEE MobiHoc 2007
2. Yuan Yuan, William Arbaugh, Songwu Lu, **Toward Scalable MAC Design in High-speed Wireless LANs**, Accepted by EURASIP JWCN, Journal on Wireless Communications and Networking
3. Yuan Yuan, Paramvir Bahl, Ranveer Chandra, Philip A. Chou, Srihari Narlanka, Yunnan Wu, **KNOWS: Building Cognitive Radio System Over White Spaces**, IEEE Dyspan 2007
4. Yuan Yuan, Starsky H. Y. Wong, Songwu Lu, William Arbaugh, **ROMER: Resilient Opportunistic Mesh Routing for Wireless Mesh Networks**, IEEE WiMesh 2005
5. Hao Yang, Fan Ye, Yuan Yuan, Songwu Lu and William Arbaugh, **Toward Resilient Security in Wireless Sensor Networks**, ACM MOBIHOC 2005
6. Yuan Yuan, L. Lily Yang, William Arbaugh, **Opportunistic Region-based Admission Control for Wireless Mesh Networks**, ACM MOBIHOC Poster 2005
7. Yuan Yuan, Daqing Gu, William Arbaugh, Jinyun Zhang, **Achieving Fair Scheduling Over Error-Prone Channels in Multirate WLANs**, IEEE WirelessCom 2005
8. Xiaoqiao Meng, Starsky Wong, Yuan Yuan, Songwu Lu, **Characterizing Flows in Large Wireless Data Networks**, ACM MOBICOM 2004
9. Yuan Yuan, Daqing Gu, William Arbaugh, Jinyun Zhang, **High-Performance MAC for High-Capacity Wireless LANs**, IEEE ICCCN 2004

10. Yuan Yuan, Daqing Gu, William Arbaugh, Jinyun Zhang, **Adapting Wireless Fair Packet Scheduling to Multirate WLANs**, IEEE VTC 2004
11. Yuan Yuan and William Arbaugh, **A Secure Service Discovery Protocol for MANET**, In Proc. of the 14th IEEE International Symposium on Personal, Indoor and Mobile Radio Communications (PIMRC 2003), vol. 1, Beijing, China, Sept. 7-11, 2003, pp. 502-506.
12. Zhai Mingyu, Yuan Yuan, **Fair Bandwidth Allocations through Queue Management in Core-Stateless Networks**, Globecom 2001, San Antonio, TX, Aug, 2001
13. Yuan Yuan Ji Yi Gu Guanqun, **Modeling the Extranet's Security Architecture with VPN**, CCICS'99, p56-62, Dec. 1999

#### Under Submission

1. Yuan Yuan, William Arbaugh, Songwu Lu, Agrawala Ashok, **On Cross-layer Adaptations in Wireless Mesh Networks**, Under submission

#### Patent Applications

1. **MWFS: Multirate Wireless Fair Scheduling for Wireless LANs**, Yuan Yuan, Daqing Gu, Jinyun Zhang, MERL US patent, Nov. 2003
2. **Adaptive Distributed Channel Access for Wireless LANs**, Yuan Yuan, Daqing Gu, Jinyun Zhang, MERL US patent, May. 2004
3. **Sequential Controlled Channel Access for Wireless LANs**, Yuan Yuan, Daqing Gu, Jinyun Zhang, MERL US patent, July. 2004
4. **Region-based Opportunistic Admission Control for Wireless Mesh Networks**, Yuan Yuan, Lily Yang, Intel Pending US patent, Aug. 2004
5. **QoS Management to Support Multimedia Applications in Wireless Mesh Networks**, Yuan Yuan, Lily Yang, Intel Pending US patent, Sept. 2004
6. **Spectrum Allocation and Medium Access Control for Cognitive Radio Networks**, Yuan Yuan, Paramvir Bahl, Ranveer Chandra, Philip A. Chou, Srihari Narlanka, Yunnan Wu, Microsoft Pending Patent, Dec. 2006
7. **Collaborative Sensing in Cognitive Radio Networks**, Yuan Yuan, Paramvir Bahl, Ranveer Chandra, Philip A. Chou, Srihari Narlanka, Yunnan Wu, Microsoft Pending Patent, Dec. 2006

#### Technique Report

1. Yuan Yuan, William Arbaugh, **Scalable and Efficient MAC for Next-Generation Wireless Data Networks**, Technical Report, Computer Science Department, University of Maryland, College Park, 2004

2. Yuan Yuan, Starky Wong, Hao Yang, Xiaoqiao, Meng, Songwu Lu, William Arbaugh, Lixia Zhang, **ROMER: Resilient Opportunistic Mesh Routing for Wireless Mesh Networks**, Technique Report, 2004
3. Yuan Yuan, Daqing Gu, Jinyun Zhang, **Implementation and Simulation documentation of IEEE 802.11e in OPNET**, Mitsubishi Electric Research Lab, Nov. 2003
4. Yuan Yuan, Ashok Agrawala, **A Secure Service Discovery Protocol for MANET**, Computer Science Technical Report CS-TR-4498, and UMIACS Technical Report UMIACS-TR-4498

### Talks

- **802.11n, Towards High-speed Wireless LANs**, Mitsubishi Research Labs, Boston, MA, May, 2004
- **QoS Management in Wireless Mesh Networks**, Intel Research, Hillsboro, OR, Aug, 2004
- **Adaptive Distributed Channel Access for Wireless LANs**, ICCCN, Chicago, IL, Oct. 2004
- **Cognitive Radio Networking: Towards Next-Generation Wireless Communication Paradigm**, Microsoft Research, Redmond, WA, Sept. 2006
- **CoRoNet, Building Cognitive Radio System Over White Spaces**, Networking Research Group Review, Microsoft Research, Redmond, WA, Jan. 2007

### Skills

- Experienced in IEEE 802.11b, 802.11e, 802.11n, 802.11s, 802.16e, 802.16, 802.22, routing protocols and scheduling algorithms in wireless networks, network measurement tools
- Experienced in wireless drivers including windows NSDI driver, MadWifi driver
- Experienced in C, C++, Java, scripting languages and network programming
- Experienced in QualNet, OPNET, ns-2 simulators

### Professional Services

- Reviewer for many journals and conferences including **IEEE INFOCOM**, IEEE International Conference on Computer Communications and Networks (ICCCN), IEEE International Conference on Communications (ICC), IEEE International Conference on Communications (WCNC), International Wireless Communications & Mobile Computing Conference (IWCWC), IEEE International Conference on Mobile Ad hoc and Sensor Systems (MASS), Network and Distributed System Security Symposium (NDSS), **IEEE Transactions on Mobile Computing**, Wiley European Transactions on Telecommunications

## References

**Dr. William Arbaugh**

Associate Professor of  
Computer Science Department  
University of Maryland, College Park  
[waa@cs.umd.edu](mailto:waa@cs.umd.edu)  
Tel: (301) 405-2774

**Dr. Songwu Lu**

Associate Professor of  
UCLA Computer Science Department  
Los Angeles, CA 90095-1596  
[slu@cs.ucla.edu](mailto:slu@cs.ucla.edu)  
Tel: (310) 794-9289

**Dr. Philip A. Chou**

Principal Researcher  
Manager of Communication and  
Collaboration Group  
Microsoft Research  
[pachou@microsoft.com](mailto:pachou@microsoft.com)  
Tel: (425) 706-3869

**Dr. Daqing Gu**

Director, Executive Principal Researcher  
Docomo Beijing Communications Labs  
Beijing , China  
[gu@docomolabs-beijing.com.cn](mailto:gu@docomolabs-beijing.com.cn)  
Tel: +86-(10)-82861501x126  
Fax. +86-(10)-82861506

**Dr. Ranveer Chandra**

Researcher  
Network Research Group  
Microsoft Research  
[Ranveer@microsoft.com](mailto:Ranveer@microsoft.com)  
Tel: (425) 706-7034

**Dr. L. Lily Yang**

Communications Technology Research Lab  
Intel Corporation  
[lily.lyang@intel.com](mailto:lily.lyang@intel.com)  
Tel: (503) 264-8813

**Dr. Victor Bahl**

Principal Researcher  
Manager of Networking Research Group  
Microsoft Research  
[bahl@microsoft.com](mailto:bahl@microsoft.com)  
Tel: (425) 706-1021

**Dr. Ashok Agrawala**

Professor of  
Computer Science Department  
University of Maryland, College Park  
[agrawala@cs.umd.edu](mailto:agrawala@cs.umd.edu)  
Tel: (301) 405-2525

**Dr. Jinyun Zhang**

Group Manager  
Digital Communications & Networking Lab  
MERL Technology Lab  
[jzhang@merl.com](mailto:jzhang@merl.com)  
Tel: (617) 621-7595

**Dr. Amer Hassan**

Wireless Architect  
Windows Networking Core System  
Microsoft Corporation  
[amerh@microsoft.com](mailto:amerh@microsoft.com)  
Tel: (425) 705-9590

**Dr. Yunnan Wu**

Researcher  
Communication and Collaboration Group  
Microsoft Research  
[yunnanwu@microsoft.com](mailto:yunnanwu@microsoft.com)  
Tel: (425) 706-5907

## Citizenship and Status

China, F-1 Visa