

Shan Lin

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Education

Ph. D. in Computer Science, University of Virginia Advisor: John. A. Stankovic Thesis: <i>Control Challenges in Cyber Physical Systems.</i>	Expected: May 2010 Charlottesville, VA
M. S. in Computer Science, University of Virginia Advisor: John. A. Stankovic. Thesis: <i>Adaptive Transmission Power Control in Wireless Sensor Networks.</i>	Jan 2007 Charlottesville, VA
B. E. , Computer Science and Engineering, Shanghai Jiao Tong University Ranking in GPA: No.1 in 113	Jun 2004 Shanghai, China

Research Interests

cyber physical systems, cognitive networking systems, and medical information systems
broad interest in networked systems, distributed systems, data mining for large scale information systems, health informatics, real-time systems, sensor systems, and robotics
applications in medical care, first responders, military surveillance, and scientific explorations

Honors and Awards

Cyber Physical System Summer School Fellowship Award	2009
SAIC Scholar Fellowship Award	2008
Student Travel Award for ACM SenSys and IEEE RTSS	2006 - 2009
Research Assistantship at University of Virginia	2004 - 2009
Excellent Internship Award at Intel China Software Center	2004
Outstanding Student Scholarship of SJTU	2000 - 2004
Exceptional Student Award of SJTU, awarded every two years	2001, 2003
Freshman Scholarship of SJTU	2000
Award for Exemption of National University Entry Examinations	2000
First Award of Shandong Province in National Mathematics Olympics	1999
First Award of Shandong Province in National Physics Olympics	1999
First Award of Shandong Province in National Biology Olympics	1999

Research Experience

University of Virginia , Charlottesville, VA Research Assistant	2004 - 2009
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System Design for Cyber Physical Systems

- Proposed a reflective architecture to take control as the first class element for cyber physical system designs, integrating control solutions and cross layer optimizations.
- Defined a control based performance metric to *competence* to study stability and another metric *relapse time* to quantify transient networking performance.
- Designed novel routing algorithms to select stable and good links by integrating long term and short estimations for stable network performance.
- Created a hierarchical control framework for maintaining stable, adaptive, and energy efficient networking performance.

- Designed control protocols for the E2E network level coordination and the pairwise link level adaptation.
- Explored network control systems to manage and configure systems to adapt to changing network conditions and meet application requirements.

Reliable Wireless Communication

- Designed a reliable wireless communication framework with a series of technologies, was selected as the **SAIC Scholars** and awarded the SAIC fellowship at UVa in 2008.
- Designed wireless body network systems for quality of service.
- Designed real-time stream scheduling protocols for bursty wireless networks.
- Designed a reliable and rapid-deployable wireless relay system for first responder applications.

Networked Information System

- Contributed to several wireless sensor network systems: AlarmNet for medical care, Luster for scientific exploration, and a wireless sensor network system for fire fighter.
- Designed inference and learning algorithms for activity recognition in medical care systems.
- Designed a feedback based encouragement system for human-in-the-loop control in medical care systems.

Intel China Software Center, Shanghai, China

2003 - 2004

Software Engineer Intern

Designed, developed, and tested as a key technical member a software suite on Intel's EPen technology, which obtained three patents, developed a demo that won praise from **Intel CEO Craig R. Barrette**.

SJTU-IBM Research Center, Shanghai, China

2002 - 2003

Undergraduate Research Assistant

Developed infrastructure for semantic web, participated in seminars under Professor Yong Yu.

ACM ICPC Team, Shanghai Jiao Tong University, Shanghai, China

2002

Substitute Team Member

Trained extensively in algorithm design and programming under Professor Yong Yu. Our team won the **world champion** of ACM International Collegiate Programming Contest (ICPC) 2002.

Publications

Adaptive Networked Systems

- S. Munir, **S. Lin**, E. Hoque, S. M. Nirjon, J. A. Stankovic, and K. Whitehouse. Addressing Burstiness for Reliable Communication and Latency Bound Generation in Wireless Sensor Networks. Accepted to *the 9th ACM/IEEE Conference on Information Processing in Sensor Networks (IPSN'10)*, 2010. Acceptance ratio: **17%** (It scored the **No.1** out of 117 submissions)
- **S. Lin**, G. Zhou, K. Whitehouse, Y. Wu, J. A. Stankovic, and T. He. Towards Stable Network Performance in Wireless Sensor Networks. In *Proceedings of the 30th IEEE Real-Time Systems Symposium (RTSS '09)*, Dec. 2009. Acceptance ratio: **12%**
- **S. Lin**, G. Zhou, Y. Wu, J. A. Stankovic, T. He and K. Whitehouse. Achieving Stable Network Performance in Wireless Sensor Networks. Poster in *Proceedings of the 6th ACM Conference on Embedded Networked Sensor Systems (SenSys '08)*, November, 2008.
- **S. Lin**, J. Zhang, G. Zhou, L. Gu, T. He, and J. A. Stankovic. ATPC: Adaptive Transmission Power Control for Wireless Sensor Networks. In *Proceedings of the 4th ACM Conference on Embedded Networked Sensor Systems (SenSys '06)*, November, 2006. Acceptance ratio: **19%** Citation Count: **100**

- Y. Wu, T. He, J. A. Stankovic, and **S. Lin**. Realistic and Efficient Multi-Channel Communications in Dense Sensor Networks. In *Proceedings of the 27th Conference on Computer Communications (Infocom '07)*, May, 2008. Acceptance ratio: **20%** Citation Count: **25**
- **S. Lin**, J. A. Stankovic, S. Munir, and T. He. Adaptive Duty Cycle Control for Extremely Low Duty Cycle Networks. In progress.

System Architecture Design

- G. Zhou, Q. Li, J. Li, Y. Wu, **S. Lin**, J. Lu, C. Wan, M. D. Yarvis, and J. A. Stankovic. Adaptive and Radio-Agnostic QoS for Body Sensor Networks. In *ACM Transactions on Embedded Computing Systems (TECS)*, 2009, to appear.
- **S. Lin**, John A. Stankovic. Performance Composition for Cyber Physical Systems. In *Proceedings of the Ph.D. Forum of the 30th Real-Time Systems Symposium (RTSS '09)*, December, 2009.
- **S. Lin**, T. He, and J. A. Stankovic. CPS-IP: Cyber Physical Systems Interconnection Protocol. In *Proceedings of the 28th Ph.D. Forum of the Real-Time Systems Symposium (RTSS '07)*, December, 2007.
- H. Liu, J. Li, Z. Xie, **S. Lin**, J. A. Stankovic, K. Whitehouse, D. Siu. Automatic and Robust Breadcrumb System Deployment for Indoor Fire-fighter Applications. In submission to *the 8th Annual International Conference on Mobile Systems, Applications and Services (MobiSys'10)*, 2010.
- **S. Lin**, and J. A. Stankovic. Performance Composition for Cyber Physical Systems. In progress.

Networked Information Systems

- G. Virone, A. Wood, L. Selavo, Q. Cao, L. Fang, T. Doan, Z. He, R. Stoleru, **S. Lin**, and J. A. Stankovic. An Advanced Wireless Sensor Network for Health Monitoring. In *Proceedings of 1st Transdisciplinary Conference on Distributed Diagnosis and Home Healthcare (D2H2 '06)*, April, 2006. Citation Count: **15**
- Wood, G. Virone, T. Doan, Q. Cao, L. Selavo, Y. Wu, L. Fang, Z. He, **S. Lin**, and J. A. Stankovic. ALARM-NET: Wireless Sensor Networks for Assisted-Living and Residential Monitoring. *Technical Report CS-2006-11*, Department of Computer Science, University of Virginia, November, 2006. Citation Count: **61**
- J. A. Stankovic, Q. Cao, T. Doan, L. Fang, Z. He, R. Kiran, **S. Lin**, S. Son, R. Stoleru, and A. Wood. Wireless Sensor Networks for In-Home Healthcare: Potential and Challenges. In *Proceedings of High Confidence Medical Device Software and Systems Workshop (HCMDSS '05)*, June, 2005. Citation Count: **54**

Professional Talks

“Towards Stable Network Performance in Wireless Sensor Networks”, RTSS	Dec 2009
“Performance Composition for Cyber Physical Systems”, RTSS	Dec 2009
“Stable Routing for Dynamic Wireless Sensor Networks”, UVa Summer Retreat	Aug 2009
“Achieving Stable Network Performance for Wireless Sensor Networks”, SenSys	Nov 2008
“CSP-IP: An Interconnection Protocol for Cyber Physical Systems”, RTSS	Dec 2007
“ATPC: Adaptive Transmission Power Control for Wireless Sensor Networks”, SenSys	Nov 2006

Teaching Experience

TA, University of Virginia

Cyber Physical Systems (CS851). Helped design the course, presented papers. Spring 2009

Recent Advances in Sensor Networks (CS851). Presented papers, helped design labs. Spring 2007

Feedback Control for Computer Systems (CS851). Presented papers, helped labs.	Spring 2006
Discrete Mathematics II (CS302). Served as a consultant and grader.	Spring 2005
Discrete Mathematics I (CS202). Served as a consultant and grader.	Fall 2004
Student Mentor, University of Virginia	
Served as a consultant for CS undergraduate students	2005 - 2007

Services

Reviewer for ACM SenSys, ACM TOSN, IEEE ICCPS, and JCN	2007 - 2009
ACM, IEEE Member	2007 - 2009
Invited lecturer, Coast to Coast Culture Connection	2006 - 2008
Research coordinator, Computer Science Department, University of Virginia	2007 - 2009
Student volunteer, IPSN '09	2009
Student volunteer, SenSys '09	2009
Student volunteer, HotEmNets '08	2008
Vice president of Chinese Student and Scholar Society, University of Virginia	2005 - 2007

Computer Expertise

C/C++ (9+yrs), JAVA (7+yrs), design and implemented a *Database Management System (DBMS)*, *Matlab*, *HTML*, *Python*, *JSP*, *Perl*, *Assembler*, and *XML*, system drivers, windows applications, very experienced in *TinyOS*, *Glomosim*, and *NS-2*.

Personal Information

Citizen of the People's Republic of China

References

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