

Joengmin Hwang

Department of Computer Science
University of Minnesota
4-192 EE/CS Building
200 Union Street SE
Minneapolis, MN 55455

Phone: (612) 532-0845
E-mail: jhwang@cs.umn.edu
URL: <http://www.cs.umn.edu/~jhwang>

RESEARCH INTERESTS

Wireless networks, network security, sensor networks, distributed embedded systems, mobile ad-hoc networks, mobile computing, cyber-physical applications, ubiquitous computing, smart devices, network modeling and simulation, localization techniques, cryptography, and spatial data mining.

EDUCATION

University of Minnesota, Minneapolis, MN.

Ph.D. in Computer Science with expected completion in December 2007 with *Yongdae Kim and Tian He*.

Thesis Title: *In-Situ Sensing Area Modeling and Location Proof in Wireless Networks*.

University of Minnesota, Minneapolis, MN.

M.S. in Computer Science, 2004.

Korea University, Seoul, Korea.

B.E. in Architectural Engineering, 1999.

PROFESSIONAL EXPERIENCES

Embedded Sensor System Research Group

Department of Computer Science, University of Minnesota, Minneapolis.

Research Assistant, 2005-2007.

- Developed and implemented two In-situ Sensing Area Modeling techniques based on field survey and machine learning to reflect sensing irregularity in embedded networked sensor systems.
- Designed Content-based Flow and Congestion Control in wireless sensor networks. Analyzed the relation between system performance and the cost for content-based control.
- Proposed a system architecture to support flexible change of running protocols in embedded systems.
- Designed MAC Protocols for Sparse Wireless Networks. Conducted relevant experiments.

Network Security Research Group

Department of Computer Science, University of Minnesota, Minneapolis.

Research Assistant, 2004-2007.

- Developed a Distributed Secure Localization technique based on randomized algorithms in wireless networks.
- Investigated Localization Attacks and Their Effects on Geographic Routing.
- Designed and implemented the first protocol to enable Location-based Access Control in the presence of colluding attack based on 802.11 protocol in wireless LAN.
- Analyzed Key Pre-distribution Schemes based on the random graph theory.

Other Research Experiences at the University of Minnesota, Minneapolis.

- Summer Research Assistant in Computer Architecture and Compilers (register renaming and the measurement of thread-level parallelism), Spatial Data Mining Research (spatio-temporal cohesive networks).

PUBLICATIONS

A Framework for Discovering Spatio-Temporal Cohesive Networks.

Jin Soung Yoo and **Joengmin Hwang**.

To appear in Proceedings of the 9th International Pacific-Asia Conference on Knowledge Discovery and Data Mining (PAKDD '08).

Secure Localization with Phantom Node Detection.

Joengmin Hwang, Tian He and Yongdae Kim.

To appear in Elsevier Journal of Ad Hoc Networks.

Exploring In-Situ Sensing Irregularity in Wireless Sensor Networks.

Joengmin Hwang, Tian He and Yongdae Kim.

In Proceedings of the 5th ACM International Conference on Embedded Networked Sensor Systems (SenSys '07), pp. 289-303, Acceptance rate 16%.

uSense: A Unified Asymmetric Sensing Coverage Architecture for Wireless Sensor Networks.

Yu Gu, **Joengmin Hwang**, Tian He and David Hung-Chang Du.

In Proceedings of the 27th IEEE International Conference on Distributed Computing Systems (ICDCS '07), Acceptance rate 13%.

Detecting Phantom Nodes in Wireless Sensor Networks.

Joengmin Hwang, Tian He and Yongdae Kim.

In Proceeding of the 26th IEEE International Conference on Computer Communications (INFOCOM '07), pp. 2391-2395, Acceptance rate 25%.

Realistic Sensing Area Modeling.

Joengmin Hwang, Yu Gu, Tian He and Yongdae Kim.

In Proceeding of the 26th IEEE International Conference on Computer Communications (INFOCOM '07), pp. 2421-2425, Acceptance rate 25%.

Achieving Realistic Sensing Area Modeling.

Joengmin Hwang, Tian He and Yongdae Kim.

In Proceedings of the 4th ACM International Conference on Embedded Networked Sensor Systems (SenSys '06), poster, pp. 415-416.

Energy Efficient Organization of Mobile Sensor Networks.

Joengmin Hwang, David Hung-Chang Du and Ewa Kusmierk.

In Journal of Parallel Algorithms Appl. 2005. Vol.20(3-4), pp. 221-233.

Revisiting Random Key Pre-distribution Schemes for Wireless Sensor Networks.

Joengmin Hwang and Yongdae Kim.

In Proceedings of the 2nd ACM Workshop on Security of Ad Hoc and Sensor Networks (SASN '04), pp. 43-52.

Energy Efficient Organization of Mobile Sensor Networks.

Joengmin Hwang, David Hung-Chang Du and Ewa Kusmierk.

In Proceedings of the 33rd International Conference on Parallel Processing Workshops (ICPP '04), pp. 84-91.

PAPER REVIEW

IEEE Symposium on Security and Privacy 2007, IJSNet 2007, IEEE WoWMoM 2007, IEEE INFOCOM 2006, IEEE/CreateNet SecureComm 2005.

PRESENTATIONS

“Exploring In-Situ Sensing Irregularity in Wireless Sensor Networks.” SenSys 2007.

“Detecting Phantom Nodes in Wireless Sensor Networks.” INFOCOM 2007.

“Realistic Sensing Area Modeling.” INFOCOM 2007.

“Revisiting Random Key Pre-distribution Schemes for Wireless Sensor Networks.” SASN 2004.

“Energy Efficient Organization of Mobile Sensor Networks.” ICPP Workshops 2004.

SKILLS

- More than 5-year experience in protocol design, implementation, and evaluation in embedded systems, WLAN, and mobile ad-hoc networks.
- More than 7-year experience in software system design and implementation.
- Strong background on network protocols, network security, and cryptography.
- Operating Systems : Linux, Sun Solaris, Windows, TinyOS.
- Computer Languages : C/C++, Java, NesC, MIPS assembly language, Perl.
- Tools : MATLAB, Mathematica, NS-2, Oracle, VHDL, Ethereal, Tcpdump, Weka data mining software.

REFERENCES

Professor Yongdae Kim
Department of Computer Science
University of Minnesota, Minneapolis, MN
Phone: (612) 626-7526
E-mail: kyd@cs.umn.edu

Professor Tian He
Department of Computer Science
University of Minnesota, Minneapolis, MN
Phone: (612) 626-1281
E-mail: tianhe@cs.umn.edu

Professor Zhi-Li Zhang
Department of Computer Science
University of Minnesota, Minneapolis, MN
Phone: (612) 625-8568
E-mail: zhzhang@cs.umn.edu

Professor Andrew M. Odlyzko
Digital Technology Center
University of Minnesota, Minneapolis, MN
Phone: (612) 624-9510
E-mail: odlyzko@umn.edu

Professor John A. Stankovic
Department of Computer Science
University of Virginia, Charlottesville, VA
Phone: (434) 982-2275
E-mail: stankovic@cs.virginia.edu