

WEIJIA LI

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OBJECTIVE

A summer internship or a full time job in a leading research laboratory or company.
Positions that I am interested in include: **Computer Science Researcher** in wireless sensor network or compiler design, **Project Manager** and **Software Engineer**.

EDUCATION

Ph.D. (Expected graduation in 2010), Computer Science Department, University of Pittsburgh.
Area: Wireless Sensor Networks and Compilers.
Dissertation title: "Software Update Management in Wireless Sensor Networks".
Advisor: Dr. Youtao Zhang.
GPA: 3.7/4.0.

B.S. (July 2003), Computer Science, Nanjing University, P.R.China.

PROFESSIONAL EXPERIENCE

Project Manager/Quality Engineer (2003 - 2005), Bell Labs, Alcatel Lucent, Nanjing, P.R.China.
Shipped four releases as a project manager. Tracked the software development progress and solved the complex scheduling issues across multiple teams. Collected software development quality data, and led the quality improvement process. Provided software development process training and auditing for software engineers.

Software Engineer (2003 - 2005), Bell Labs, Alcatel Lucent, Nanjing, P.R.China.
Developed the server configuration user interface for mobile devices, while working with a high-pace international software development team. Development followed CMMI and TL9000.

HONORS

Andrew Mellon Pre-doctoral Fellowship (2008 - 2009), University of Pittsburgh.

A&S Graduate Student Organization Travel Grant (2009), University of Pittsburgh.

CRA-W/CDC Logic Programming Summer School Travel Grant (2008).

CRA-W/CDC Programming Language Summer School Travel Grant (2007).

IEEE MASS Student Travel Grant (2006).

People's Scholarship (2002), Nanjing University, P.R. China.

RESEARCH PROJECTS

Update-conscious compilation techniques

- Update-conscious register allocation
Developed the first update-conscious compilation techniques for energy-efficient code dissemination in wireless sensor networks. The compiler reduces the `diff` between the old and new binaries by applying update-conscious register allocation.
- Update-conscious data allocation
Developed the first code update scheme for digital signal processing (DSP) applications that saves energy during code updates by minimizing patch size. The technique involved update-conscious compilation that reduces the `diff` between the old and new binaries by applying update-conscious data allocation.

Code dissemination protocols for wireless sensor networks (WSNs)

- MCP: an energy-efficient code distribution protocol for multi-application WSNs
Studied the code distribution problem in multi-application WSNs, and designed a state-ful multicast-based code redistribution protocol to achieve energy efficiency in WSN software updates.
- Adaptive buffer management for efficient code dissemination in multi-application WSNs
Proposed a peer to peer code dissemination protocol for multi-application WSNs. Designed an adaptive buffer management mechanism to utilize the limited memory storage of wireless sensors in code dissemination.

Context-aware patch script design

- Summarized the `diff` between the old and new binaries by identifying the context-aware changes. For example, instead of transmitting individual updated instructions caused by data allocation changes, the updated data allocation results are transmitted during code update.

Wireless sensor network security

- Dynamic authentication-key re-assignment
Designed an annulus-based authentication-key re-assignment scheme for wireless sensor networks, in order to defend against packet dropping and injection attacks simultaneously.
- Locating compromised sensor nodes through Incremental hashing authentication
Designed a proven collision-resilient incremental hashing algorithm for wireless sensor network routing. This scheme defended against both true report dropping and false report injection attacks. Using this method, sink nodes were able to locate the compromised nodes and rebuild the network routing.

TEACHING EXPERIENCE

TA for Graduate Algorithms (Spring 2009) Developed a web-based homework peer review system and assigned homework reviews.

TA for Undergrad Data Structures (Summer 2008) Gave weekly recitations and graded assignments.

TA for Graduate Compiler Design (Spring 2008) Graded assignments.

TA for Undergrad Software Engineering (Fall 2007) Gave a few lectures, and graded assignments and exams.

TA for Graduate Computer Architecture (Fall 2007) Tutored Virtutech Simics and Graded assignments.

PUBLICATIONS

An Efficient Code Update Scheme for DSP Applications in Mobile Embedded Systems

In *Proceedings of ACM SIGPLAN/SIGBED Conference on Languages, Compilers and Tools for Embedded Systems (LCTES 2010)*, Stockholm, Sweden, April 2010.

Authors: Weijia Li and Youtao Zhang

<http://www.cs.pitt.edu/~weijiali/mypapers/lctes10.pdf>

An authentication scheme for locating compromised sensor nodes in WSNs

In *Journal of Network and Computer Applications (JNCA 2010)*.

Authors: Youtao Zhang, Jun Yang, Weijia Li, Linzhang Wang and Lingling Jin.

Towards Update-Conscious Compilation for Energy-Efficient Code Dissemination in WSNs

To appear in *ACM Transactions on Architecture and Code Optimization (TACO)*.

Authors: Weijia Li, Youtao Zhang, Jun Yang and Jiang Zheng

<http://www.cs.pitt.edu/~weijiali/mypapers/taco.pdf>

MCP: an Energy-Efficient Code Distribution Protocol for Multi-Application WSNs

In *Proceedings of the 5th IEEE International Conference on Distributed Computing in Sensor Systems (DCOSS 2009)*, Marina Del Rey, California, June 2009.

Authors: Weijia Li, Youtao Zhang and Bruce Childers

<http://www.cs.pitt.edu/~weijiali/mypapers/dco09.pdf>

Adaptive Buffer Management for Efficient Code Dissemination in Multi-Application Wireless Sensor Networks

In *Proceedings of IEEE International Conference on Embedded and Ubiquitous Computing (EUC 2008)*, Shanghai, China, December 2008.

Authors: Weijia Li, Yu Du, Youtao Zhang, Bruce Childers, Ping Zhou and Jun Yang

<http://www.cs.pitt.edu/~weijiali/mypapers/euc08.pdf>

UCC: Update-conscious Compilation for Energy Efficiency in Wireless Sensor Networks

In *Proceedings of ACM SIGPLAN Conference on Programming Language Design and Implementation (PLDI 2007)*, San Diego, California, June 2007.

Authors: Weijia Li, Youtao Zhang, Jun Yang and Jiang Zheng

<http://www.cs.pitt.edu/~weijiali/mypapers/pldi07.pdf>

Dynamic Authentication-Key Re-assignment for Reliable Report Delivery

In *Proceedings of IEEE 3rd International Conference on Mobile Ad-hoc and Sensor Systems (MASS 2006)*, Vancouver, Canada, October 2006.

Authors: Weijia Li, Youtao Zhang and Jun Yang

<http://www.cs.pitt.edu/~weijiali/mypapers/mass06.pdf>

Locating Compromised Sensor Nodes through Incremental Hashing Authentication

In *Proceedings of IEEE International Conference on Distributed Computing in Sensor Systems (DCOSS 2006)*, San Francisco, June 2006.

Authors: Youtao Zhang, Jun Yang, Lingling Jin and Weijia Li

<http://www.cs.pitt.edu/~weijiali/mypapers/dco06.pdf>

SERVICE AND MEMBERSHIP

Business Manager (2009 - 2010), Women in Computer Science (WiCS), University of Pittsburgh.

Member (since 2009), Networking Networking Women (N^2 Women).

Member (since 2007), Computer Research Association's Committee on the Status of Women in Computing Research (CRA-W).

Newsletter Editor (2000 - 2001), Department of Computer Science, Nanjing University, P.R. China.

SKILLS

PLs	C/C++, PHP, Python, Perl.
WSN related	TinyOS, NesC, MICA/MICA2 Platform.
Tools	Matlab, CVS, L ^A T _E X, Simics, SimpleScalar, AMPL, MS Office.
OS	Linux, Unix, MacOS, Windows.

INTERESTS

Social Websites and Online Social Games. Culinary Arts. Chinese Calligraphy.

REFERENCES

References can be provided upon request.