

# LAN BAI

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## EDUCATION

- **University of Michigan**, Ann Arbor, MI 01/2009 to 06/2011  
Ph.D. in Computer Science and Engineering GPA: 4.0/4.0
- **Northwestern University**, Evanston, IL 09/2005 to 12/2008  
M.S. in Electrical and Computer Engineering GPA: 3.85/4.0
- **University of Science & Technology of China**, Hefei, China 09/2001 to 07/2005  
B.S. in Electrical Engineering GPA: 3.7/4.0

## PROFESSIONAL EXPERIENCE

**Research Assistant – University of Michigan**, Ann Arbor, MI 01/2009 to 06/2011

- Synthesis for wireless sensor networks
  - Skills: wireless network simulation (contributor to Sidnet-SWANS simulator), statistical modeling, optimization, wireless network protocols, C, Python, Java, R
  - Designed and implemented a framework to automatically construct system-level models for sensor networks
- Programming languages for wireless sensor networks
  - Skills: interdisciplinary collaboration, user interface design, user study, statistical tests, Qt, Python, Lex & Yacc, TinyOS
  - Designed an easy-to-use, compact, high-level programming language, associated compiler, and graphical user interface for a class of sensor network applications
  - Designed and conducted a user study to evaluate usability of sensor network programming languages
- Personal pollutant exposure monitoring system
  - Skills: gas sensor, sensor calibration, system design, algorithm design
  - Formulated and solved sensor placement problem
  - Proposed online collaborative calibration algorithm
  - Participated in the design of system infrastructure

**Student Advisor – University of Michigan**, Ann Arbor, MI Summer 2009

- Assisted student team in the Design Challenge Competition to build a personnel-carried improvised explosive detecting system

**Summer Research Assistant – NEC Labs America**, Princeton, NJ 06/2006 to 09/2006

- Improved performance of JFFS2 file system on a cellphone platform
- Developed adaptive, predictive filesystem compression algorithm

**Research Assistant – Northwestern University**, Evanston, IL 09/2006 to 12/2008

- **Process variation aware MPSoC energy minimization**
  - Skills: Python, AMPL, CPLEX
  - Formulated the problem of task assignment and power management mode selection on an MPSoC in the presence of process variation. Solved the problem with an integer-linear program solver and evaluated improvement compared to process variation unaware technique

- Invention disclosure: Process variation characterization of chip-level multiprocessors
- **Adaptive filesystem compression for embedded systems**
  - Skills: C, Python, algorithm design and implementation
  - Designed an algorithm to adaptively choose compression algorithm for files to optimize file access performance under disk size constraint
- **Automated memory compression techniques for MMU-less embedded systems**
  - Skills: C++, code transformation, compiler optimization, data compression, LLVM
  - Designed and implemented compile-time and run-time memory compression techniques for MMU-less embedded systems
  - Realized and evaluated the technique on a sensor node platform

**Teaching Assistant – Northwestern University**, Evanston, IL 2006 to 2008 (3 quarters)

- Lectured discussion sessions, graded homework and exams, supervised labs, and hosted office hours for courses “Introduction to Computer Engineering” and “Advanced Digital Logic Design”

## PUBLICATIONS

- L. S. Bai, R. P. Dick, P. A. Dinda, and Pai Chou: Automated Construction of Fast and Accurate System-Level Models for Wireless Sensor Networks. In *Proc. Design, Automation, and Test in Europe Conf.*, Mar. 2011, pp. 1083-1088
- L. S. Bai, R. P. Dick, P. A. Dinda, and Pai Chou: Simplified Programming of Faulty Sensor Networks via Code Transformation and Run-Time Interval Computation. In *Proc. Design, Automation, and Test in Europe Conf.*, Mar. 2011, pp. 88-93
- L. S. Bai, R. P. Dick, and P. A. Dinda: Archetype-Based Design: Sensor Network Programming for Application Experts, Not Just Programming Experts. In *Proc. Conf. Information Processing in Sensor Networks* Apr. 2009, pp. 85-96
- L. Zhang, L. S. Bai, R. P. Dick, L. Shang, and R. Joseph: Process Variation Characterization of Chip-Level Multiprocessors. In *Proc. Design Automation Conf.*, Jul. 2009, pp. 694-697
- L. S. Bai, L. Yang, and R. P. Dick: MEMMU: Memory Expansion for MMU-Less Embedded Systems. In *ACM Trans. Embedded Computing Systems*, vol. 8, no. 3, April 2009, pp. 23-33
- L. S. Bai, H. Lekatsas, and R. P. Dick: Adaptive Filesystem Compression for Embedded Systems. In *Proc. Design, Automation, and Test in Europe Conf* Mar. 2008, pp. 1374-1377
- L. S. Bai, L. Yang, and R. P. Dick: Automated Compile-Time and Run-Time Techniques to Increase Usable Memory in MMU-Less Embedded Systems. In *Proc. Int. Conf. Compilers, Architecture & Synthesis for Embedded Systems* Oct. 2006, pp. 125-135

## SKILLS

- Proficient in C/C++, Python, Java. Experience with Qt, MATLAB, R, SQL
- Platform: Unix/Linux, Windows
- Languages: fluent in English and Chinese

## HONORS & AWARDS

- Anna Olcott Smith Award, University of Michigan 2011
- Murphy Fellowships Award, Northwestern University 2005 to 2006
- Huawei Cup Design Competition Awards (Grade 3) Summer 2004  
University of Sci. & Tech. of China