

Lei Yang

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RESEARCH	◇ Power-aware system design ◇ Memory hierarchy techniques ◇ Embedded operating systems ◇ Embedded processor architectures	
EDUCATION	Ph.D. in Electrical and Computer Engineering Northwestern University, Evanston, IL, USA, GPA: 4.0/4.0	2008.06
	M.S. in Electrical and Computer Engineering Northwestern University, Evanston, IL, USA, GPA: 4.0/4.0	2005.06
	B.S. in Electrical Engineering Peking University, China, Dept. of Electronics, GPA: 3.6/4.0, Major GPA: 3.9/4.0	2003.07
STANDARD TESTS	GRE 2360 (V 780 A 790 Q 790) TOEFL 653 (TWE 6.0) TSE 5.0	2001.10 2002.05 2002.10
AWARDS	Computerworld Horizon Award Awarded for high-impact commercially-used information technology.	2007.08
	Presidential Fellowship Award This highly competitive award is the most prestigious fellowship awarded by Northwestern . It is awarded to stellar students who combine outstanding intellectual and creative ability with the capability to play an active part in the life of the Society of Fellows. Fellowships are awarded for two years; every year, only six out of the entire graduate school are awarded.	2007.09 - 2009.09
	Murphy Fellowships Award Awarded to outstanding new graduate students in the Robert R. McCormick School of Engineering and Applied Science, Northwestern University.	2003.09 - 2004.09
	1st Prize Award National Undergraduate Electronic Design Contest, Shanghai, China.	2002.10
ACADEMIC EXPERIENCE	Research Assistant, Northwestern University Develop and implement OS control policies of reducing memory requirement as well as power consumption of embedded systems. Research supported by Northwestern University, NEC Laboratories America, Inc., and the National Science Foundation.	2003.09 - present
	Teaching Assistant, Northwestern University Was able to give clear lectures and effectively communicate with students. CTEC (Course and Teacher Evaluation Council) evaluation by students was 5.5/6.0 (4.6/6.0 on average for graduate school TAs).	2004.03 - 2004.06
	Undergraduate Student, Peking University Actively involved in various research/engineering projects, of which "A novel image transmission system based on public telecommunication network" won the 1st prize in <i>National Undergraduate Electronic Design Contest</i> .	1999.09 - 2003.07
PROFESSIONAL EXPERIENCE	Platforms Software Engineer, Google Data analysis for data center automation.	2008.09 - present
	Summer Software Engineering Intern, Google Evaluated various power reduction techniques on Google production machines, using large scale Google workloads. Built comprehensive testing infrastructure to perform single node and cluster-scale tests. The performance impacts of evaluated techniques are experimentally identified and provide important baseline numbers for power provisioning at Google data center.	2007.06 - 2007.09
	Summer Research Assistant, NEC Laboratories America Designed and implemented an efficient operating system controlled RAM compression technique that doubles application available memory in embedded systems without changing applications, or hardware,	2004, 2005

and with little or no performance or power penalty. **This technology is in the process of being patented by NEC and Northwestern University. NEC used this technology in their cellphones in June 2007.**

Publication List

* *The following papers appear in embedded systems, CAD, and computer architecture conferences that have 15%-25% acceptance rates. For each paper, a presentation is given.*

CONFERENCE PUBLICATIONS

- X. Chen, L. Yang, H. Lekatsas, R. P. Dick, and L. Shang, "Design and Implementation of a High-Performance Microprocessor Cache Compression Algorithm", in *Proc. IEEE Data Compression Conf.*, pp. 43-52, Mar. 2008.
- A. Shye, L. Yang, X. Chen, B. Ozisikyilmaz, A. Mallik, B. Lin, P. A. Dinda, G. Memik, and R. P. Dick, "Empathic Computer Architectures and Systems", in *Proc. Int. Conf. Architectural Support for Programming Languages and Operating Systems - Wild and Crazy Ideas VI (ASPLOS-WACI)*, Seattle, WA, Mar. 2008.
- L. Yang, R. P. Dick, H. Lekatsas, and S. Chakradhar, "CRAMES: Compressed RAM for Embedded Systems", in *Proc. Int. Conf. Hardware/Software Codesign and System Synthesis*, pp. 93-98, Sept. 2005.
- L. Yang, R. P. Dick, and H. Lekatsas, "High-Performance Operating System Controlled Memory Compression", in *Proc. Design Automation Conf.*, pp. 701-704, June 2006.
- L. Bai, L. Yang, and R. P. Dick, "Automated Compile-Time and Run-Time Techniques to Increase Usable Memory in MMU-Less Embedded Systems", to appear in *Proc. Int. Conf. Compilers, Architecture, and Synthesis for Embedded Systems*, Oct. 2006.

JOURNAL PUBLICATIONS

- L. Yang, R. P. Dick, H. Lekatsas, and S. Chakradhar, "RAM for Free", *IEEE Spectrum*, August, 2008.
- L. Yang, H. Lekatsas, and R. P. Dick, "High-Performance Operating System Controlled On-Line Memory Compression", *ACM Transactions in Embedded Computing Systems (TECS)*, to appear.
- L. Yang, R. P. Dick, H. Lekatsas, and S. Chakradhar, "On-Line Memory Compression for Embedded Systems", *ACM Transactions in Embedded Computing Systems (TECS)*, to appear.
- L. Bai, L. Yang, and R. P. Dick, "Automated Compile-Time and Run-Time Techniques to Increase Usable Memory in MMU-less Embedded Systems", *ACM Transactions in Embedded Computing Systems (TECS)*, to appear.
- L. Yang, A. Liu, and R. P. Dick, "Automatic Run-Time Extraction of Communication Graphs and Memory Access Patterns from Multithreaded Applications", *ACM Transactions on Design Automation of Electronic Systems (TODAES)*, under review.

TECHNICAL REPORTS

L. Yang, X. Chen, R. P. Dick, and L. Shang, "Chip Multiprocessor Cooperative Cache Compression and Migration", Northwestern University, Apr. 2008.

PATENT DISCLOSURE

L. Yang, R. P. Dick, H. Lekatsas, and S. Chakradhar, "Memory Compression in the Linux Kernel for Embedded Systems", patent pending, NEC Labs America and Northwestern University, Feb. 2005.

DISSERTATION

- L. Yang, "Transparent Memory Hierarchy Compression and Migration", Ph.D. Dissertation, Dept. of Electrical Engineering and Computer Science, Northwestern University, June. 2008.
- L. Yang, "On-Line Data Memory Compression for Embedded Systems", Master's Thesis, Dept. of Electrical Engineering and Computer Science, Northwestern University, June 2005.