

Student Resume: Pei Zhang

Address:

Pei Zhang
Computer Engineering
Princeton University
E-Quad, Olden Street
Princeton, NJ 08544

Ph.D. candidate in Electrical Engineering, Princeton University

Planned Graduation Date: May/2008

Faculty Adviser: Professor Margaret Martonosi

Citizenship: US

Phone (609) 356-2525

E-mail peizhang@princeton.edu

WWW <http://www.peizhang.com>

Research Interests: Power Aware Collaboration, wireless sensor network, and ubiquitous systems

Degree Received:

6/2004: MA degree in Electrical Engineering, Princeton University

6/2002: Bachelor of Science degree in Electrical Engineering with Honors, California Institute of Technology

Awards and Qualifications Summary

- Wu Prize for Excellence, Awarded by the School of Engineering and Applied Science (SEAS) of Princeton University for upper-year graduate students who have performed at the highest level of courses, research and teaching, Sep. 2007
- Outstanding Teaching Assistant Award, by the Department of Electrical Engineering Princeton University, Sept. 2005- Pei Zhang ELE302,
- Co-winner of the Global Photonics Energy Corporation's (GPEC) Edith and Martin B. Stein Solar Energy Innovation Award, 2005
- Student design contest winner at International Symposium on Low-Power Electronics and Design, 2003
- Primary designer of the ZebraNet Hardware and Middleware
- Experienced programming in C, C++, Java, TinyOS, VHDL, perl, assembly(x86, PIC and Motorola HC11, 5800x, msp430, PAL, Mach, FPGA, TI dspC55)
- Experience with Digital Particle Image Velocimetry (DPIV) and algorism programming

Publications:

Yong Wang and Pei Zhang and Ting Liu and Chris Sadler and Margaret Martonosi.

"Movement Data Traces from Princeton ZebraNet Deployments". CRAWDAD Database. <http://crawdad.cs.dartmouth.edu/>. 2007.

Trevor Pering, Pei Zhang, Rohit Chaudhri, Yaw Anokwa and Roy Want. " The PSI Board: Realizing a Phone-Centric Body Sensor Network", 4th International Workshop on Wearable and Implantable Body Sensor Networks (BSN2007). Mar, 2007.

Pei Zhang, Chris Sadler and Margaret Martonosi. "Middleware for Long-term Deployment of Delay-tolerant Sensor Networks", The first International Workshop on Middleware for Sensor Networks (MidSens'06). Nov, 2006.

Pei Zhang and Margaret Martonosi. "Energy Adaptation Techniques to Optimize Data Delivery in Store-and-Forward Sensor Networks", The Fourth ACM Conference on Embedded Networked Sensor Systems. Nov, 2006.

Pei Zhang, Chris Sadler, Ting Liu, Ilya Fischhoff, Margaret Martonosi, Stephen A. Lyon, Daniel I. Rubenstein, "Habitat Monitoring with ZebraNet: Design and Experiences", book chapter in "Wireless Sensor Networks: A Systems Perspective", N. Bulusu and S. Jha (editors), Artech House, 2005.

Pei Zhang, Christopher M. Sadler, Steve A. Lyon, and Margaret Martonosi. "Hardware Design Experiences in ZebraNet", SenSys 2004. The Second ACM Conference on Embedded Networked Sensor Systems. Nov, 2004.

T. Liu, C. Sadler, P. Zhang, and M. Martonosi. "Implementing Software on Resource-Constrained Mobile Sensors: Experiences with Impala and ZebraNet", Mobisys 2004. The Second International Conference on Mobile Systems, Applications, and Services. June, 2004.

Research Summary:

I am working with Professor Margaret Martonosi on my PhD thesis: "Dynamic Management of Sparse Mobile Systems with Intermittent Connectivity". I am currently working on collaborative localization methods for sparse and intermittently connected networks. I am developing a method for intermittently connected mobile nodes in a heterogeneous system to collaboratively estimate location based on encounters with nodes possessing different hardware common in ubiquitous computing. I also developed on a simple but effective method that budget node energy so each mobile node would hit a targeted system lifetime. I am also participating in the Sarana project, which is a Resource and Space Aware Computing Architecture for Dynamic Networks. Previously, I have been the lead designer of the ZebraNet nodes, which was deployed in Kenya during 2004 and 2005. I am also responsible for parts of the firmware as well as the middleware that is currently used in ZebraNet. I am very interested in tackling challenges relating to ubiquitous computing and mobile systems, developing simple yet effective methods that takes advantage of both software and hardware techniques.

Selected Relevant Coursework:

- Switching and Sequential Systems
- Computer Architecture
- Linear System Theory
- Processor Architecture for New Paradigms
- Introduction to Control in Electrical Systems
- Analog Circuit Design
- VLSI Design Lab
- Analog design lab
- Micro-fabrication Technology for Solid-State Devices

Previous Research Experience (Caltech)

- Jan/2001-Jun/2002 (Professor Theodore Wu)
 - Arsenic-meter design, involving high precision measurements
 - Product to market
- Summer 2000 (Professor Glen George)
 - Digitally Controlled Buck-Boost (Fly-back) Converter
 - Digital feedback system
- Summer 1999 (Professor Theodore Wu)

- Designed and ran wave experiments on longshore current cause by obliquely incident waves
- Used digital particle image velocimetry system for image analysis, with algorism developing
- Written programs for image analysis in C to calculate vector fields
- Designed and built experimental equipment and setup

Previous Work Experience

- Summer 2007 (Microsoft Research India. Dr. Venkat Padmanabhan)
 - Design and implementation of mobile distributed OS for mobile phones
 - Explored novel collaborative Localization techniques
- Summer 2006 (Intel Inc. Dr. Roy Want)
 - Participate in designing of phone interface board
 - Work to develop applications for ubiquitous computing
 - Explore and design NFC attachment.
- Summer 2005 (Flarion Technologies, Inc., Frank Lane)
 - Power analysis of the Flarion magnemite ASIC
 - Develop power model for baseband and rf chipset
 - Formulation of micro-architecture design guidelines for low power operation
- Summer 2002 (Caltech, Professor Theodore Wu)
 - Design of experiment for non-linear Soliton wave motion
 - Analysis wave interaction on inclined beaches
- Summer 2001 (Boeing Satellite Systems)
 - Design of power supply test equipments
 - Analysis of tapped converter power supply
 - Analysis of tin whisker growth's impact in space
- Summer 1998 (Teslaco, Professor Cuk)
 - Build ready designed hardware
 - Introduced to Cuk converters, and the basics of power converters
 - Hardware testing

Teaching Assistant Experience (Caltech, Princeton)

- Teaching Assistant for ELE302 (03-04, 04-05) Princeton
- Head Teaching Assistant for EE90, EE91a, EE91b, Senior Electronic Project Course (2000-2002) Caltech
- Teaching Assistant for EE4, EE105, digital logic, and VLSI design course (2001-2002) Caltech