Ben Zhang

Curriculum Vitae

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Research Interests

Embedded Systems, Wireless and Mobile Systems, Sensor Networks, Cyber-Physical System

Education

Tsinghua University, Beijing, China *Aug 2008 - Jul 2012*

Bachelor of Engineering in Electronic Engineering

- Major GPA: 93.2/100, Cumulative GPA 91.3/100, top 10%
- Admitted as top 10 students in Shaanxi Province among more than 410,000 students

Chinese University of Hong Kong, Hong Kong, China *Sept 2010 - Jan 2011*

Exchange Student in Electronic Engineering Department, GPA 3.95/4.0

Academic Experience

Mobile and Sensing Systems, Microsoft Research Asia, Beijing, China *Jun 2011 - present*

Research Intern, advised by Dr. Xiaofan Fred Jiang

LiveSynergy

A novel magnetic-based wireless proximity detection platform to provide cloud-based APIs that enable real-time and rich interactions between humans and their physical environment.

- Embedded hardware system design and debugging; improved the system reliability and MCU transient immunity; manufactured 60+ boards for deployment.
- Design and development of Windows Phone 7.5 native application to enable bi-directional interaction
- Conducted experiments to measure the reliability and consistency for zone proximity sensing of current technologies (BLE, RFID, ZigBee); post-processed the raw data and compared the results with our magnetic-based platform.
- Presented several demos for UbiComp Open House Demo and MSR Technical Review Board.

SEPTIMU

A novel hardware system to provide human with continuous in-situ human wellness monitoring and feedback using sensors embedded in earphones.

- Designed the prototype with microphone and IMU, perfectly embedded in normal earphones.
- A Windows Phone App and Matlab code for the communication using audio jack.

PhoneWeb

The PhoneWeb project seeks to enable handheld devices to continuously and accurately discover all the people around it and to create and maintain a local neighborhood map.

- Implemented a GUI frontend for PhoneWeb - SubwayRendezVous client
- Help create a brief video to promote this project within MSRA
- Bluetooth low energy technology characteristic testing

Digital Television Laboratory (DTV), Tsinghua U, Beijing, China *Jul 2009 - Jun 2011*

Research Assistant, advised by Prof. Kewu Peng

- Analyzed the iterative corporation between the demapper and the decoder in BICM-ID system based on EXIT char tool.
- Proposed a simplified criterion – Hamming Euclidean Distance Spectra – to evaluate the equivalence of labelings and obtain the classification of unique mappings; submitted a patent to suggest a constellation mapping and de-mapping scheme by applying this criterion on DVB-S2 coded modulation systems.

- Conducted experiments for the evaluation of set-top box over different multi-path channels for building a model of Single Frequency Network.

Other Projects:

- Data communications between DSPs, Hardware platform: Blackfin 533
- Implementation of Bloom Filter accelerated IP lookup, Hardware platform: NetFPGA
- Case study on Data Center Network
- A photo quality evaluation system based on various features extracted from photos
- HDB3 encoding/decoding, Hardware platform: FPGA
- Sudoku solver, Hardware platform: Intel 8051

Publications & Patents

1. Xiaofan Jiang, Chieh-Jan Mike Liang, Kaifei Chen, **Ben Zhang**, Jeff Hsu, Bin Cao, Jie Liu, and Feng Zhao, "Design and Evaluation of a Wireless Magnetic-based Proximity Detection Platform for Indoor Applications", to appear in the Proceedings of the 11th ACM/IEEE Conference on Information Processing in Sensor Networks (IPSN 2012), Apr. 2012.

2. Dezhi Hong, **Ben Zhang**, Qiang Li, S. M. Shahriar Nirjon, Robert Dickerson, Guobin Shen, Xiaofan Jiang, John A. Stankovic, "Demo Abstract: SEPTIMU - Continuous In-situ Human Wellness Monitoring and Feedback using Sensors Embedded in Earphones", to appear in IPSN 2012, Apr. 2012.

3. **Ben Zhang**, Kewu Peng, Jian Song, Junhao Lin, "Optimal Labeling Searching based on Classification of Unique Mapping for BICM-ID with 8-APSK", to appear 2012 IEEE International Symposium on Power Line Communications and Its Applications (ISPLC 2012), Mar. 2012.

4. Xiaofan Jiang, Chieh-Jan Mike Liang, Feng Zhao, Kaifei Chen, Jeff Hsu, **Ben Zhang**, and Jie Liu, "Demo: Creating Interactive Virtual Zones in Physical Space with Magnetic-Induction", the 9th ACM Conference on Embedded Networked Sensor Systems (SenSys 2011), Nov. 2011

5. Kewu Peng, **Ben Zhang**, Junhao Lin, Hui Yang, and Changyong Pan, "A Constellation Mapping and De-mapping Scheme for DVB-S2 Coded Modulation Systems", Chinese Invention Patent, Patent Application Number: 201110216908.2

Leadership Activities

Youth Ambassador Program for Minorities, Beijing *Jun 2009-Jun 2010*

Project President

YAPM is committed to preserve the culture diversity of ethnic groups by evoking and empowering the local youth, sponsored by Goldman Sachs Social Entrepreneur Foundation in 2006

- Expanded the project sites from 4 to 8, covering 6 provinces; managed to get 200,000 sponsorship from Diageo;
- Effectively improved the communications among Beijing, Shanghai and Hong Kong branches.

Awards & Honors

ACM Sensys'11 Best Demo Award, Seattle, WA (*among 33 demos*) *Nov 2011*
HNA Academic Excellence Scholarship, Tsinghua U (*top 10%*) *Nov 2011*
Zeng Rongsen Scholarship, Tsinghua U (*top 15%*) *Nov 2010*
First Prize in Physics Competition, Beijing *May 2010*
Yongwang Scholarship awarded for Academic Excellence, Tsinghua U (*top 15%*) *Nov 2009*
Tongfang Scholarship for Excellent Freshman, Tsinghua U (*top 10 in Shaanxi Province*) *Sept 2008*
First Prize in National Chemistry Olympic Competition, Shaanxi Division *Oct 2007*

Personals & Skills

- English: TOEFL(iBT) 109; GRE 610+800+4.0

- Computer Languages: Assembly, C, C++, C#, NesC, Verilog, Matlab, Python, HTML, XAML
- Applications: Pspice, Visual DSP++, Multisim, Quartus, EAGLE PCB design, LaTeX