

# Tingxin Yan

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## CONTACT INFORMATION

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## RESEARCH INTERESTS

My research interests are primarily in the areas of mobile and embedded systems, wireless sensor networks, ubiquitous computing, and crowdsourcing. My current research include crowdsourcing-based mobile applications, context-aware mobile system, and distributed mobile sensing. I am also interested in data management in wireless sensor networks, and data mining from large mobile application traces.

## EDUCATION

### University of Massachusetts at Amherst

Amherst, MA

*Ph.D in Computer Science*

July 2012 (expected)

- Thesis: Exploiting Crowdsourcing for Novel Mobile Services
- Committee: Prof. Deepak Ganesan, Don Towsley, Mark Corner, and Weibo Gong
- GPA: 3.96/4.0

### Chinese Academy of Sciences, Institute of Software

Beijing, China

*M.S. in Computer Engineering*

July 2006

- GPA: 4.0/4.0

### Nanjing University

Nanjing, China

*B.S. in Computer Engineering*

July 2003

- GPA: 3.8/4.0

## RESEARCH EXPERIENCES

### University of Massachusetts at Amherst

Amherst, MA USA

*Research Assistant*

Sept 2006 – present

- Advisor: Prof. Deepak Ganesan
- With Prof. Don Towsley, Mark Corner, Prashant Shenoy, and R. Manmatha.
- In *CrowdSearch*, I designed a real-time image search system where search results are validated with humans in the loop. CrowdSearch improves the search accuracy to over 95% consistently. The core component of CrowdSearch is the modeling of user behavior in crowdsourcing systems, specifically the tradeoff between incentives, latency, and accuracy.
- In *mCrowd*, I designed a platform for distributing crowdsourcing tasks to users smartphones. mCrowd platform greatly simplifies the publishing and distributing process of crowdsourcing tasks in a variety of mobile phones.
- In *SenSearch*, I designed an energy efficient image search engine for mobile phones and wireless sensor networks. SenSearch extracts and transmits compact features from raw images to reduce the energy cost of image search by up to 5X.
- In *DualCam*, I designed an efficient camera driver suit and a reliable transmission protocol for a dual camera sensor network.
- In *MUDS*, I participated in the design of a progressive transmission protocol on a testbed comprised of 15 Apple Mac-mini machines.

### Microsoft Research

Redmond, WA

*Research Intern*

Jun – Aug 2011

- Mentor: Dr. David Chu
- With Dr. Jie Liu and Dr. Aman Kansal
- In *Condos*, I designed an application pre-loading component named FALCON for Windows Phone OS. The core of FALCON is a decision engine which exploits user behaviour and context to pre-load apps ahead of time, thereby improve the responsiveness of smartphones.

**Nokia Research***Research Intern*Palo Alto, CA  
May – Nov 2010

- Mentor: Dr. Baik Hoh
- In *CrowdPark*, I designed a mobile application which exploits crowdsourcing to collect and share open parking information. The core of CrowdPark is an incentive protocol which ensures honest playing of participants in the system.
- In *SenPark*, I designed an automated parking status reporting system for mobile phones, which enables mobile users to report vacant parking spots without human interference. The core of SenPark is a mobile sensing module which takes advantages of accelerometer and compass data to infer the motion status of mobile users.

**Chinese Academy of Sciences***Research Assistant*Beijing, China  
Sept 2004 – July 2006

- With Prof. Limin Sun and Prof. Zhimei Wu
- In *SmarkPark*, I designed a load-balancing routing protocol for sensor networks to prolong its lifetime up to 20%.
- In *IOS-Mote*, I built a CC2420 compatible driver with higher communication range.

TEACHING  
EXPERIENCES**University of Massachusetts at Amherst***Teaching Assistant*Amherst, MA USA  
Jan 2011 – May 2011

- Teaching assistant of UM-CS377: Operating Systems, an undergrad core course.
- My duties include designing course project, hosting one lecture and one lab session every week, and grading students' programming work and exams.

SELECTED  
PUBLICATIONS**CrowdPark: A Crowdsourcing-based Parking Reservation System for Mobile Phones.**Tingxin Yan, Baik Hoh, Deepak Ganesan, Ken Tracton, Toch Iwuchukwu, Juong-Sik Lee  
*UMASS Technical Report, UM-CS-2011-001, UMass Amherst, 2011***CrowdSearch: Exploiting Crowds for Accurate Real-time Image Search on Mobile Phones.**Tingxin Yan, Vikas Kumar, and Deepak Ganesan.  
*ACM MobiSys 2010. San Francisco, CA. June 2010***mCrowd: A Platform for Mobile Crowdsourcing.**Tingxin Yan, Matt Marzilli, Ryan Holmes, Deepak Ganesan, and Mark Corner.  
*Demo at ACM SenSys 2009. Berkeley, CA. Nov 2009***Distributed Image Search in Camera Sensor Networks.**Tingxin Yan, Deepak Ganesan and R. Manmatha.  
*ACM SenSys 2008. Raleigh, NC. Nov 2008***Design and Implementation of a Dual-Camera Wireless Sensor Network for Object Retrieval.**Dan Xie, Tingxin Yan, Deepak Ganesan and Allen Hanson.  
*ACM/IEEE IPSN 2008. St. Louis, Missouri, April 2008.***Multi-user Data Sharing in Radar Sensor Networks.**Ming Li, Tingxin Yan, Deepak Ganesan, Eric Lyons, Prashant Shenoy, Arun Venkataramani and Michael Zink.  
*ACM SenSys 2007. Sydney, Australia, Nov 2007.***ESTS: An Error Statistic Based Time Synchronization Protocol for Wireless Sensor Networks.**Limin Sun, Haidong Wang, Tingxin Yan, and Jingjing Liu.  
*IEEE Intl Conference on Intelligent Computing(ICIC). Kunming, China. August 2006.*

**Probability Based Dynamic Load-Balancing Tree Algorithm for Wireless Sensor Networks.**  
Tingxin Yan, Yanzhong Bi, Limin Sun, and Hongsong Zhu.  
*IEEE Intl Conference on Computer Network and Mobile Computing (ICCNMC). Zhangjiajie, China. August 2005.*

ARTICLES UNDER SUBMISSION **FALCON: Fast App Launching for Mobile Devices using Predictive User Context**  
Tingxin Yan, David Chu, Deepak Ganesan, Jie Liu, and Aman Kansal.  
*In submission to ACM MobiSys 2012*

**SenPark: Crowdsourcing-based Open Parking Sharing using Smartphones**  
Tingxin Yan, baik Hoh, Deepak Ganesan and Ken Tracton.  
*In preparation*

INVITED TALKS **Condos: A Context-aware Mobile Operating System.**  
Microsoft Research Summer Intern HCI Workshop, Redmond, WA 2011

**CrowdSearch: Exploiting Crowds for Accurate Real-time Image Search on Mobile Phones.**  
IBM Research T.J.Watson, Hawthorne, NY, 2010

**Exploiting Crowdsourcing for Large Scale Mobile Sensing and Data Processing**  
MobiSys'10 PhD Forum, San Francisco, 2010

**CrowdPark: Crowdsourcing-based Real-time Parking Availability**  
Nokia Research, Palo Alto 2010

**Distributed Image Search for Mobile Phones**  
UMASS CIIR Colloquium, Amherst MA, 2009

**Distributed Image Search for Mobile Phones**  
UMASS Systems Lunch, Amherst MA, 2009

PENDING PATENTS **Context-based Device Action Prediction.**  
Tingxin Yan, David Chu, Jie Liu, Aman Kansal.

**Method and Apparatus for Sharing and Managing Resource Availability Data.**  
Tingxin Yan, Baik Hoh, Ken Tracton, and Juong-Sik Lee.

**Method and Apparatus for Automatic Open Parking Resources Sharing Using GPS-enabled Mobile Devices.**  
Tingxin Yan, Baik Hoh, Ken Tracton, and Deepak Ganesan

AWARDS Travel Awards: SenSys 2008, SenSys 2009  
Outstanding Graduate Student, Chinese Academy of Sciences, 2006.  
Outstanding Thesis Award, Chinese Academy of Sciences, 2006.  
Scholarship: People's Scholarship, Nanjing University, 2001 – 2003.

PROFESSIONAL SERVICES TPC member: Intl. Conference on Multimedia and Ubiquitous Engineering (MUE) 2011  
Reviewer: IEEE Pervasive Computing and Communication (PerCom) 2012  
External Reviewer: Infocom 2006, 2008-2009; IPSN 2007, 2010-2011; SenSys 2008-2011; Mobi-com 2011; HCOMP 2011, ICDCS 2012  
Membership: Member of ACM, IEEE and USENIX

## REFERENCES

### **Prof. Deepak Ganesan**

*Associate Professor*

Department of Computer Science  
University of Massachusetts, Amherst

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### **Prof. R. Manmatha**

*Associate Professor*

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### **Dr. David Chu**

*Researcher*

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Redmond, WA

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### **Dr. Baik Hoh**

*Senior Researcher*

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