

Wenchao Zhou

Ph.D. Candidate
Computer and Information Science
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Research Interest

My research aims to ease the implementation, management, and analysis of secure distributed systems. I adopt a multi-disciplinary approach to address this problem by unifying three bodies of work: a) logic-based trust management systems, b) declarative networking framework that leverages compact declarative specifications of network protocols, and c) database techniques for analyzing data computations via the concept of provenance.

I am a member of Database (<http://db.cis.upenn.edu/>), NetDB@Penn (<http://netdb.cis.upenn.edu/>), and QTM - Quantitative Trust Management (<http://rtg.cis.upenn.edu/qtm/>) research groups at University of Pennsylvania.

Education

University of Pennsylvania, Philadelphia, PA September 2007 - present
Ph.D. Candidate in Computer and Information Science. GPA: 3.98/4.0.
Advisor: *Prof. Boon Thau Loo*

University of Pennsylvania, Philadelphia, PA September 2007 - May 2009
M.S.E in Computer and Information Science. GPA: 3.98/4.0.
Received A+ in two (out of four) required core courses (Theory of Computation and Software Systems) taken by first/second year doctoral students.
Advisor: *Prof. Boon Thau Loo*

Tsinghua University, Beijing, China September 2002 - June 2006
B.S.E. in Computer Science and Technology. GPA: 89.6/100, Ranking: 16/182 (top 10%).
Advisor: *Prof. Xia Yin*

Publications

- **A3: An Extensible Platform for Application-Aware Anonymity**
Micah Sherr, Andrew Mao, William R. Marczak, Wenchao Zhou, and Boon Thau Loo
To appear in *the 17th Annual Network & Distributed System Security Symposium (NDSS)*, San Diego, California, Feb 2010.
- **Maintaining Recursive Views of Regions and Connectivity in Networks**
Mengmeng Liu, Nicholas E. Taylor, Wenchao Zhou, Zachary Ives, and Boon Thau Loo
To appear in *IEEE Transactions of Knowledge and Data Engineering (TKDE) Journal, Special Issue on Best Papers of ICDE 2009*.

- **DMaC: Distributed Monitoring and Checking**
Wenchao Zhou, Oleg Sokolsky, Boon Thau Loo, and Insup Lee
In the *9th International Workshop on Runtime Verification (RV)*, Grenoble, France, Jun 2009.
- **Unified Declarative Platform for Secure Networked Information Systems** [16.8% acceptance]
Wenchao Zhou, Yun Mao, Boon Thau Loo, and Martin Abadi
In the *25th International Conference on Data Engineering (ICDE)*, Shanghai, China, Apr 2009.
- **Recursive Computation of Regions and Connectivity in Networks** [16.8% acceptance]
Mengmeng Liu, Nicholas E. Taylor, Wenchao Zhou, Zachary G. Ives, and Boon Thau Loo
In the *25th International Conference on Data Engineering (ICDE)*, Shanghai, China, Apr 2009.
- **Declarative Reconfigurable Trust Management** [27.1% acceptance]
William R. Marczak, David Zook, Wenchao Zhou, Molham Aref, and Boon Thau Loo
In the *4th Biennial Conference on Innovative Data Systems Research (CIDR)*, Pacific Grove, CA, Jan 2009.
- **Provenance-aware Secure Networks**
Wenchao Zhou, Eric Cronin, and Boon Thau Loo
In the *4th International Workshop on Networking meets Databases (NetDB)*, in conjunction with *ICDE*, Cancun, Mexico, Apr 2008.

Research Experience

University of Pennsylvania, Philadelphia, PA September 2007-present
Research Assistant, performed research in secure distributed systems, database technologies, and trust management systems, covering the following topics:

- **Declarative Secure Distributed Systems (DS2)**: Developed a unified specification of declarative networking and logic-based trust management. Extended the pipelined semi-naive query evaluation to incorporate secure communications. Performed a comprehensive evaluation to discuss the performance of *DS2* (*in collaboration with Prof. Boon Thau Loo*).
- **Network Provenance**: Explored the processing and optimization of network provenance which “explains” the derivations of any network state. Developed a taxonomy of network provenance and its mapping to use cases for secure networking (*in collaboration with Prof. Boon Thau Loo*).
- **Meta-programmable Trust Management**: Conceptualized and implemented LBTrust, a reconfigurable, and meta-programmable system for extensible trust management, where security constructs can be customized and composed in a declarative fashion (*in collaboration with Prof. Boon Thau Loo, and LogicBlox Inc.*).
- **Distributed Monitoring and Checking (DMaC)**: Explored the problem of deploying runtime verification of distributed systems. Designed and developed *DMaC*, a system that monitors and checks running systems against formally specified properties in a distributed fashion (*in collaboration with Prof. Insup Lee, Prof. Boon Thau Loo, and Prof. Oleg Sokolsky*).

Microsoft Research Asia, Beijing, China September 2005 - January 2007
Visiting Student, participated in the following research projects, aiming at improving user experience of online search:

- **Visualization of MSN Social Networks**: Studied the projection of a point from a high-dimensional space onto a hyperbolic plane, and applied the techniques to visualize the hierarchy of MSN spaces (*in collaboration with Dr. Benyu Zhang*).

- **Customizable Multi-Criteria Page Ranking:** Proposed and implemented a novel online algorithm for page ranking under multiple criteria. The work is incorporated in the MSN personalized search (*in collaboration with Dr. Chenxi Lin*).

Tsinghua University, Beijing, China

September 2004 - January 2005

Research Assistant, developed and implemented an algorithm to recognize players from tennis videos, and applied machine learning techniques to analyze the game strategy of a given player.

Teaching Experience

- Teaching Assistant, CIS 505 - Software Systems, University of Pennsylvania, Spring 2009.
- Teaching Assistant, CIS 553/TCOM 512 - Networked System, University of Pennsylvania, Fall 2008.
- Teaching Assistant, the C Programming Language, Tsinghua University, Fall 2002.
- Student Coach, Team China for International Olympiad for Informatics (IOI), 2003.

Selected Awards and Honors

- Excellent Visiting Student of Microsoft Research Asia, Beijing, China, 2006
- Excellent Graduate of Tsinghua University, Beijing, China, 2006.
- 4th Place, the 2nd National Business Management Competition, Beijing, China, 2006.
- ShundeWu Couple Scholarship, Tsinghua University, Beijing, China, 2005.
- 2nd Place, ACM International Collegiate Programming Contest Asia Division, Beijing, China, 2004.
- Dongfeng Motor Group Co. Fellowship, Tsinghua University, Beijing, China 2004.
- Hosogoe Fellowship, Tsinghua University, Beijing, China, 2003.
- Gold Medal, the 18th National Olympiad in Informatics (NOI), Xi'an, China, 2001.

Professional Activities

- Reviewer, *International Conference on Very Large Data Bases (VLDB)*, 2007/2008/2009.
- Reviewer, *International Conference on Data Engineering (ICDE)*, 2009/2010.
- Reviewer, *Biennial Conference on Innovative Data Systems Research (CIDR)*, 2009.
- Reviewer, *International Conference on emerging Networking EXperiments and Technologies (CoNEXT)*, 2009.
- Reviewer, *Conference on Computer Communications (InfoCom)*, 2009.
- Reviewer, *Transactions on Programming Languages and Systems (TOPLAS)*, 2007.