

Ying Zhang

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Research Interests

- Network monitoring and diagnosis from both ISP and end user's perspectives, Internet routing security.

Education

- **University of Michigan** Aug. 2004 - present
PHD Candidate, Department of Electrical Engineering and Computer Science, GPA 7.9
- **Peking University** Sep. 2000 – Jun. 2004
Bachelor of Science, Department of Computer Science & Technology, GPA 3.74/4.0, Rank 8/120
- **Guangdong Railway Senior High School** Sep. 1997 – Jul. 2000
Rank top 1/180,000 in National Entrance Examination in Guangdong Province

Publications

- **Effective Diagnosis of Routing Disruptions from End Systems** by Ying Zhang, Zhuoqing Morley Mao, Ming Zhang, to appear in the 5th USENIX Symposium on Networked Systems Design & Implementation (NSDI '08), April 2008
- **Measurement Study of Internet Delay Asymmetry** by Abhinav Pathak, Himabindu Pucha, Ying Zhang, Y. Charlie Hu, and Z. Morley Mao, to appear in the 9th Passive and Active Measurement Conference (PAM 2008), April 2008
- **Internet Routing Resilience to Failures: Analysis and Implications** by Jian Wu, Ying Zhang, Z. Morley Mao, Kang G. Shin, in 3rd International Conference on emerging Networking Experiment and Technologies (CoNEXT), December 2007
- **Practical Defenses Against BGP Prefix Hijacking** by Zheng Zhang, Ying Zhang, Y. Charlie Hu, and Z. Morley Mao, in 3rd International Conference on emerging Networking Experiment and Technologies (CoNEXT), December 2007
- **On the Impact of Route Monitor Selection** by Ying Zhang, Zheng Zhang, Z. Morley Mao, Y. Charlie Hu, *Proceedings of Internet Measurement Conference*, San Diego, California, October 2007.
- **A Firewall for Routers: Protecting Against Routing Misbehavior** by Ying Zhang, Z. Morley Mao, Jia Wang, *Proceedings of 37th Annual IEEE/IFIP International Conference on Dependable Systems and Networks (DSN)*, Edinburgh, UK, June 2007.
- **A Framework for Measuring and Predicting Impact of Routing Changes** by Ying Zhang, Z. Morley Mao, and Jia Wang, *Proceedings of the 26th Annual IEEE Conference on Computer Communications (Infocom 2007)*, Anchorage, Alaska, May 2007.
- **Understanding Network Delay Changes Caused by Routing Events** by Himabindu Pucha, Ying Zhang, Z. Morley Mao, Y. Charlie Hu, *Proceedings of ACM SIGMETRICS (SIGMETRICS07)*, San Diego, California, June 2007.
- **Low-Rate TCP-Targeted DoS Attacks Disrupts Internet Routing** by Ying Zhang, Z. Morley Mao, and Jia Wang, *Proceedings of 14th Annual Network & Distributed System Security Symposium (NDSS 2007)*, San Diego, California, February 2007.
- **Internet Traffic and Multiresolution Analysis** by Ying Zhang, Zihui Ge, Suhas Diggavi, Z. Morley Mao, Matthew Roughan, Vinay Vaishampayan, Walter Willinger, and Yin Zhang, to appear in *Markov*

Processes and Related Fields: A Festschrift in Honor of Thomas G. Kurtz/, S. N. Ethier, J. Feng and R. H. Stockbridge (eds.), IMS Lecture Notes--Monograph Series,2007

- **Internet-scale Malware Mitigation: Combining Intelligence of the Control and Data Plane**, by Ying Zhang, Evan Cooke, and Z. Morley Mao, *Proceedings of ACM CCS Workshop on Rapid Malcode (WORM 2006)*, Fairfax, Virginia, November 2006.
- **Web Service Automated Composition in Digital Library**, by Ying Zhang, Ming Zhang, Shuan Wang , *National Database Conference, China,2004*

Research Projects

- Network monitoring and measurement from end systems Jul 2007 – now
Designed and implemented an active measurement system that enables end systems to monitor the compliance of service level agreement of the ISP networks. It enables end users to monitor and diagnose network performance degradation.
- Interaction between control plane and data plane Feb 2006 – May 2007
Studied the impact of routing change and routing anomaly on data plane performance. Designed and implemented a system to automatically monitor the data plane reachability problem triggered by routing changes.
- Routing security project Sep 2004 – Feb 2006
Designed and implemented a firewall for protecting router's security. The system normalized malformed BGP packets and abnormal routing updates. It successfully protects local network from being polluted by external malicious networks.
Studied the attacks towards Internet routing protocols. In particular, the attack has low rate property which is stealthy and is hard to detect. We propose mitigation methodologies.
- Troubleshooting Layer-3 MPLS VPN network. May 2005 – now
Designed and implemented a troubleshooting framework to diagnose network disruption in the large scale Layer-3 MPLS VPN network. We customized various data mining technique to identify inherent correlation of failure alarms in different network devices and protocols.
- Multi-resolution analysis of network traffic matrix Jul 2006 – Jul 2007
Studied the correlation of traffic matrices in different granularity: ISP level, PoP level, and router level. Modeled the translation across layers using wavelet transformation.
- Full-time summer intern in AT&T Research Lab. Jul 2006 –Sep 2006
Design and implement a network troubleshooting tool for MPLS VPN backbone network.
- Full-time summer intern in AT&T Research Lab. May 2005 – Aug 2005
Design and conduct the analysis on the interaction between routing protocol BGP and its transport protocol TCP. Analyze the impact of routing attacks.
- Design and implement a peer-to-peer system for multimedia application. Sep 2004 – Dec 2004.
- Research Assistant of Information & Database Labs of Peking University May 2003-Jun 2004
Participate in the research project *Digital Library* sponsored by the Natural Science Foundation of China, National 863 High-Tech Program.
Research on the Automated Web Service and implement that the complex web service automated composition with BPEL4WS and JESS.
- Research Assistant of Microprocessor R&D Center of Peking University Sep 2002-Apr 2003
Participate in research project *Unity-863 SOC System and Network Computer* sponsored by the Natural Science Foundation of China, State 863 High-Tech Program and Key Project of Science and Technology Research of Ministry of Education P.R.C. Porting Linux on the Unicore simulator.

Teaching Experience

- EECS 181: Introduction to Computer System Winter 2006
Taught two lab sections and office hours, designed homework and exam problems, grading.
- EECS 489: Computer Networks Winter 2007
Taught discussion class and held office hours, created and graded homework, course projects and exams

Honors

- Honorable Mention, University of Michigan CSE Graduate Student Honors Competition 2007
- EE Fellowships and NR-EE Fellowships, University of Michigan at Ann Arbor 2005
- 2004 EE Fellowships and NR-EE Fellowships, University of Michigan at Ann Arbor 2004
- Excellent Students Award of Peking University 2001 – 2004
- Mingde Fellowship 2001 – 2004

Presentations

- **On the Impact of Route Monitor Selection**, Presented at the *Proceedings of Internet Measurement Conference*, San Diego, California, October 2007.
- **A Framework for Measuring and Predicting Impact of Routing Changes** Presented at *the 26th Annual IEEE Conference on Computer Communications (Infocom 2007)*, Anchorage, Alaska, May 2007.
- **Low-Rate TCP-Targeted DoS Attacks Disrupts Internet Routing** Presented at the *14th Annual Network & Distributed System Security Symposium (NDSS 2007)*, San Diego, California, February 2007.
- **Internet-scale Malware Mitigation: Combining Intelligence of the Control and Data Plane**, Presented at *ACM CCS Workshop on Rapid Malcode (WORM 2006)*, Fairfax, Virginia, November 2006.
- **An Effective Troubleshooting Framework in MPLS VPN Networks**, Presented at *AT&T University Collaboration Symposium*, Florham park, New Jersey, July 2006

Extracurricular Activities

- Board member of Chinese Students and Scholars Association (CSSA) in University of Michigan, 2004.
- Active member in Michigan China Fellows (MCF) and Center of Chinese Study (CCS) in the University of Michigan, Fall, 2005 – present
- Chair of commission committee of the class, consecutively for four years, 2000 - 2003.
- Chief Player in the basketball team of Computer Science Department, 2001 - 2004.