

Mingwei Zhang
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<https://mwzhang.com>

EDUCATION

Ph.D. in Computer Science
University of Oregon, Eugene OR, USA
Advisor: Prof. Jun Li
Research interests: Computer Network and Security
Sept 2012 – Sept 2019

Bachelor of Engineering in Network Engineering
Beijing University of Posts and Telecommunications (BUPT), Beijing, China
GPA: 3.6
Sept 2008 – June 2012

PROFESSIONAL EXPERIENCE

Internet Data Scientist, CAIDA/UC San Diego, Summer 2018 – Present
Supervisor: Alberto Dainotti
Develop large-scale inter-domain routing security monitoring system.

Graduate Research Fellow, University of Oregon, Fall 2012 – Summer 2018
Supervisor: Jun Li, Network & Security Research Laboratory, University of Oregon
Research on projects on Internet routing and DDoS defense and developed BGP monitoring framework in Java and Kotlin with more than 20k lines of code.

Undergraduate Researcher Tsinghua University, Spring 2012
Supervisor: Shao Li, Bioinformatics Division
Developed bioinformatics statistical analysis system using Perl for drug side-effect prediction.

Undergraduate Researcher Chinese Academy of Sciences, Fall 2011
Supervisor: Ying Liu, School of Information Science
Developed GPU accelerated kernels for data mining algorithms in NVidia CUDA.

Kernel Quality Engineering Intern Redhat, Inc., Beijing, China March – Jun 2012
Responsible for conducting Redhat Linux kernel testing tasks.

RESEARCH EXPERIENCE

Graduate Research Fellowship, University of Oregon, Fall 2012 – 2018
Supervisor: Professor Jun Li, University of Oregon

- Project: Collaborative DDoS Defense (DrawBridge)
Design and implement for inter-ISP collaborative DDoS defense system using software-defined networking (SDN). Study DDoS defense incentives using game-theory, and examine the collaborative DDoS defense efficiency with large-scale simulations.
- Project: Internet Seismograph (I-seismograph)
Develop Internet seismograph that monitors the Internet routing messages, and detect large-scale events. Design and implement visualization component and web-interface (<http://iseismograph.cs.uoregon.edu>).

- Project: Buddyguard – Reliable Detection of IP Prefix Hijacking.
Design and develop the extensions and improvements Buddyguard, a BGP anomaly detecting system that detects BGP prefix hijackings and route leaks. Detected and confirmed new prefix hijacking and route leak events.
- Project: Monitoring and Visualizing Internet Routing Activities
Design and develop a comprehensive system that detects and visualizes Border Gateway Protocol (BGP) activities. Designed pipelining architecture of BGP monitoring system. Implemented Java-based Multi-Threaded Routing Toolkit (RFC6369) parser.
- Project: GPU-assisted software defined networking (SDN).
Responsible for building parallel wildcard matching algorithm for SDN switches in Nvidia CUDA language. Implemented CUDA based lookup kernel and test suite driver.

Undergraduate Researcher Tsinghua University, Spring 2012
Supervisor: Shao Li, Bioinformatics Division

- Project: Drug side-effects prediction with biological correlation network.
Mainly worked on statistical analysis on drug side-effects data using Perl and R tool kits.

Undergraduate Researcher Chinese Academy of Sciences, Fall 2011
Supervisor: Ying Liu, School of Information Science

- Designed parallel BackPropagation, QuickProp with CUDA on GPU.
Utilized GPU memory coalescing, stream, and reduction optimizations methods using NVidia CUDA to achieve order-higher algorithm acceleration.

TEACHING EXPERIENCE

Instructor University of Oregon, – Winter 2014

- CIS110 – Fluency with Information Technology
Sole instructor for a class of 45 students. The class teaches students basic computer science concepts and building websites using HTML and CSS. Classroom evaluation review at 4.7/5.0.

Graduate Teaching Fellowship University of Oregon, – Winter 2014

- CIS533 – Introduction to Computer and Network Security
Responsible for designing homeworks, grading, and resolving questions.

Graduate Teaching Fellowship University of Oregon, Winter 2012 – Summer 2013

- CIS111 – Web Programming: JavaScript & the DOM API
Responsible for giving lectures on HTML/Javascript and leading labs.

PUBLICATIONS

Mingwei Zhang, Lumin Shi, Devkishen Sisodia, Jun Li, Peter Reiher, “On Multi-Point, In-Network Filtering of Distributed Denial-of-Service Traffic,” IFIP/IEEE International Symposium on Integrated Network Management, in publication, 2019

Konstantinos Arakadakis, Pavlos Sermpezis, Vasileios Kotronis, **Mingwei Zhang**, Alistair King, Alberto Dainotti, Xenofontas Dimitropoulos, “Analysis of BGP prefix hijacking events: a commercial service’s view,” CoNEXT poster, 2018

Mingwei Zhang, Jun Li, Scott Brooks, “I-seismograph: Observing, Measuring, and Analyzing Internet Earthquakes,” IEEE/ACM Transactions on Networking, vol. PP, no. 99, pp. 1-16, 2017

Lumin Shi, **Mingwei Zhang**, Jun Li, Peter Reiher, “PathFinder: Capturing DDoS Traffic Footprints on the Internet,” International Federation for Information Processing (IFIP) Networking 2018.

Jun Li, Josh Stein, **Mingwei Zhang**, Olaf M Maennel, “An Expectation-Based Approach to Policy-Based Security of the Border Gateway Protocol,” Global Internet Symposium, 2015

Mingwei Zhang, “On the state of inter-domain and intra-domain routing security”, technical report, Computer and Information Science Department, University of Oregon, 2015

Mingwei Zhang, “BGPInspector: A Real-time Extensible Border Gateway Protocol Monitoring Framework”, technical report, Computer and Information Science Department, University of Oregon, 2014

Jun Li, Skyler Berg, **Mingwei Zhang**, Peter Reiher, Tao Wei, “DrawBridge – Software-Defined DDoS-Resistant Traffic Engineering”, presented at SIGCOMM Poster and Demo Session, 2014.

Presentations

Mingwei Zhang, “DrawBridge Demonstration,” DHS DDoSD PI Meeting, San Diego, 2016

Mingwei Zhang, Jun Li, Peter Reiher, “Game-Theory-Based DDoS Defense Strategy Study,” Graduate Research Forum, University of Oregon, 2016

Mingwei Zhang, “DrawBridge — Leveraging Software-Defined Networking for DDoS Defense”, NANOG 66 Lightning Talk, San Diego, 2016

Gavriil Chaviras, Petros Gigis, Andrew Weiner, **Mingwei Zhang**, “Automated prefix deaggregation as a defense mechanism,” First CAIDA BGP Hackathon, San Diego, 2016

Mingwei Zhang, “Internet Routing Anomaly Detection and Root-cause Analysis”, Graduate Research Forum, University of Oregon, 2015

Mingwei Zhang, “Internet Routing Anomaly Detection and Visualization”, Graduate Research Forum, University of Oregon, 2014

Mingwei Zhang, “Buddyguard+: An Adaptive IP Prefix Anomaly Monitor”, Poster Contest, Computer and Information Science, University of Oregon, 2014

HONORS AND AWARDS

06/2014 Student travel grant winner for ACM SIGCOMM 2014 conference

01/2014 Student travel grant winner for USENIX NSDI 2014 conference

08/2013 Student travel grant winner for IEEE CNS 2013 conference

03/2011 Honorable Mention in Mathematical Contest in Modeling (MCM)

09/2011 Scholarships for Excellent Academic Performance, BUPT

09/2010 Scholarships for Excellent Academic Performance, BUPT