

Anduo Wang

Temple University, Computer and Information Sciences

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Research Interest

As a networking researcher, I apply database, formal methods and programming language techniques to create and automate management of flexible, reliable, and provably correct networks.

Education

University of Pennsylvania, Ph.D., Computer and Information Science	08/2013
Advisors: Boon Thau Loo, Andre Scedrov	
Thesis: Automated Formal Analysis of Internet Routing Configurations	
University of Pennsylvania, M.S.E., Computer and Information Science	12/2009
Tianjin University, B.S., Computer Science	07/2004

Work and Research Experience

Temple University – Assistant professor	1/1/2016 - present
University of Illinois at Urbana-Champaign – Postdoctoral research associate	12/2013 - 12/31/2015
SRI International, Menlo Park – International fellow	Summer 2010, 2011, 2012

Publications

Software-defined networking

Ravel: A Database-Defined Network. **Anduo Wang**, Xueyuan Mei, Jason Croft, Matthew Caesar, Brighten Godfrey., Symposium on Software-Defined Networking Research, March, 2016

Ravel: Orchestrating Software-Defined Networks. **Anduo Wang**, Brighten Godfrey, Matthew Caesar., Symposium on Software-Defined Networking Research: Demos, June, 2015

Software-Defined Networks as Databases. **Anduo Wang**, Wenchao Zhou, Brighten Godfrey, Matthew Caesar., Open networking summit, March, 2014

Automated Synthesis of Reactive Controllers for Software-Defined Networks. **Anduo Wang**, Salar Moarref, Ufuk Topcu, Boon Thau Loo, Andre Scedrov., 3rd International Workshop on Rigorous Protocol Engineering (**WRiPE**), October 2013

On the Feasibility of Automation for Bandwidth Allocation Problems in Data Centers. Yifei Yuan, **Anduo Wang**, Rajeev Alur, Boon Thau Loo., 13th Conference on the Theory and Applications of Formal Methods in Hardware and System Verification (**FMCAD**), October 2013

Scale up network analysis

A Reduction-based Approach Towards Scaling Up Formal Analysis of Internet Configurations. **Anduo Wang**, Alexander J.T. Gurney, Xianglong Han, Jinyan Cao, Boon Thau Loo, Carolyn Talcott and Andre Scedrov., The 33rd Annual IEEE International Conference on Computer Communications (**INFOCOM**), April 27th - May 2nd, 2014, Canada

Reduction-based Formal Analysis of BGP Instances. **Anduo Wang**, Carolyn Talcott, Alexander J.T. Gurney, Boon Thau Loo and Andre Scedrov., 18th International Conference on Tools and Algorithms for the Construction and Analysis of Systems (**TACAS**), Mar 2012

Reduction-based analysis of BGP systems with BGPVerif **Anduo Wang**, Alexander J.T. Gurney, Xianglong Han, Jinyan Cao, Carolyn Talcot, Boon Thau Loo, Andre Scedrov., ACM Special Interest Group on Data Communication (**ACM SIGCOMM**) **demonstration**, Helsinki, Finland, Aug, 2012

Brief announcement: a calculus of policy-based routing systems, **Anduo Wang**, Carolyn Talcott, Alexander Gurney, Boon Thau Loo, Andre Scedrov., ACM symposium on Principles of distributed computing (**PODC**), 2012

Analyze real-world routing policies

Analyzing BGP Instances in Maude **Anduo Wang**, Carolyn Talcott, Limin Jia, Boon Thau Loo, Andre Scedrov., 13th Formal Methods for Open Object-Based Distributed Systems and 31th Formal Techniques for Networked and Distributed Systems (**FMOODS/FORTE**), 2011

Partial Specifications of Routing Configurations. Alexander J. T. Gurney, Limin Jia, **Anduo Wang**, and Boon Thau Loo., 1st International Workshop on Rigorous Protocol Engineering (**WRiPE**), co-located with ICNP 2011, Vancouver, Canada, Oct 2011

Synthesize declarative routing system

FSR: Formal Analysis and Implementation Toolkit for Safe Inter-domain Routing. **Anduo Wang**, Limin Jia, Wenchao Zhou, Yiqing Ren, Boon Thau Loo, Jennifer Rexford, Vivek Nigam, Andre Scedrov, Carolyn L. Talcott., IEEE/ACM Transactions on Networking (**ToN**), 2012

Recent advances in declarative networking, Boon Thau Loo, Harjot Gill, Changbin Liu, Yun Mao, William R. Marczak, Micah Sherr, **Anduo Wang**, Wenchao Zhou., 14th international conference on Practical Aspects of Declarative Languages, (**PADL**), 2012

FSR: Formal Analysis and Implementation Toolkit for Safe Inter-domain Routing. Yiqing Ren, Wenchao Zhou, **Anduo Wang**, Limin Jia, Alexander J.T. Gurney, Boon Thau Loo, and Jennifer Rexford., ACM Special Interest Group on Data Communication (**ACM SIGCOMM**) **demonstration**, Toronto, Canada, Aug, 2011

An Operational Semantics for Network Datalog, Vivek Nigam, Limin Jia, **Anduo Wang**, Boon Thau Loo, and Andre Scedrov., Third International Workshop on Logics, Agents, and Mobility (**LAM**), in conjunction with LICS, July 2010

Analyze algebraic and declarative routing systems

FSR: Formal Analysis and Implementation Toolkit for Safe Inter-domain Routing. **Anduo Wang**, Limin Jia, Wenchao Zhou, Yiqing Ren, Boon Thau Loo, Jennifer Rexford, Vivek Nigam, Andre Scedrov, Carolyn L. Talcott., IEEE/ACM Transactions on Networking (**ToN**), 2012.

Formally Verifiable Networking, **Anduo Wang**, Limin Jia, Changbin Liu, Boon Thau Loo, Oleg Sokolsky, and Prithwish Basu., 8th Workshop on Hot Topics in Networks (**ACM SIGCOMM HotNets-VIII**), New York, Oct 2009 (16.0% acceptance)

A Theorem Proving Approach Towards Declarative Networking, **Anduo Wang**, Boon Thau Loo, Changbin Liu, Oleg Sokolsky, Prithwish Basu. Theorem Proving in Higher Order Logics (TPHOLs) Emerging Trends Section, August, 2009

Formalizing Metarouting in PVS, **Anduo Wang**, Boon Thau Loo., *Automated Formal Methods* workshop (AFM), co-located with 21st International Conference on Computer Aided Verification, France, 2009

Declarative Network Verification, **Anduo Wang**, Prithwish Basu, Boon Thau Loo, Oleg Sokolsky., International Symposium on Practical Aspects of Declarative Languages (PADL), 2009

Other work

Formalizing a Component Model in PVS, Kung-Kiu Lau, **Anduo Wang**., preprint 40, Technical Report, School of Computer Science, The University of Manchester, Nov 2006

A Component Based Approach to Verified Software: What, Why, How And What Next?, Kung-Kiu Lau, Zheng Wang, **Anduo Wang**, Ming Gu. 1st Asian Working Conference on Verified Software, 2006

Verifying Java Programs By Theorem Prover HOL, **Anduo Wang**, Fei He, Ming Gu, Xiaoyu Song., Proceedings of the 30th Annual International Computer Software and Applications Conference, 2006

Teaching

CS 591 – Acting out Algorithm, University of Illinois at Urbana-Champaign	Fall 2013
CIS 121 – Data Structures and Algorithms with Java, University of Pennsylvania	Fall 2009
CIS 511 – Introduction to The Theory of Computation, University of Pennsylvania	Spring 2009

Honor & Awards

Dean's Fellowship University of Pennsylvania, 2007 – 2008

Daiwa first rank fellowship Tsinghua University, 2006 – 2007

Academia Service

SDNNFVSEC 2016 Technical Program Committee, ACM International Workshop on Security in Software Defined Networks & Network Function Virtualization

ICNP 2014 Technical Program Committee (Regular Paper Track), 22nd IEEE International Conference on Network Protocols

NSDI 2014 External reviewer, 11th USENIX Symposium on Networked Systems Design and Implementation

Journal of the Association for Computing Machinery, 2012 External reviewer

TOPLAS 2011 External reviewer, ACM Transactions on Programming Languages and Systems

SECON 2011 External reviewer, 8th Annual IEEE Communications Society Conference on Sensor, Mesh and Ad Hoc Communications and Networks

SIGMOD 2011 External reviewer, ACM's Special Interest Group on Management Of Data

TPLP 2010 External reviewer, Theory and Practice of Logic Programming special issue for PADL 2010 (Practical Aspects of Declarative Languages)

LPAR 2010 External reviewer, Logic for Programming, Artificial Intelligence and Reasoning

IPTPS 2010 External reviewer, International workshop on Peer-To-Peer Systems

VLDB 2010 External reviewer, 36th International Conference on Very Large Data Bases

ACM CoNEXT 2009 External reviewer, The 5th ACM International Conference on emerging Networking Experiments and Technologies

ICDE 2008 External reviewer, International Conference on Data Engineering

POPL 2008 External reviewer, Symposium on Principles of Programming Languages