

Cheng Yi

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INDUSTRIAL EXPERIENCE

- Alibaba Group**, Sunnyvale, CA
Staff Engineer August, 2017 - Present
Build an intelligent and self-driven network management system, including network monitoring, modeling and automation.
- Cisco Tetration Analytics**, Palo Alto, CA
Technical Leader May, 2017 - July, 2017
- Google Inc.**, Mountain View, CA
Senior Software Engineer December, 2015 - April, 2017
Design and implement anycast-based global frontend load balancing.
- Software Engineer III** June, 2014 - November, 2015
Develop and maintain Google's network load balancer, a scalable and efficient distributed software system; optimize IP anycast performance.
- Software Engineering Intern** May, 2013 - August, 2013
Measure and improve the performance of IP anycast in Google's production networks; conduct a comparative performance study of IP anycast and DNS-based frontend load balancing.
- Glodon Software Co., Ltd.**, Beijing, China
Software Engineer July, 2005 - May, 2008
Develop and maintain the Construction Cost Management system.

EDUCATION

- University of Arizona**, Tucson, AZ
Ph.D., Computer Science August, 2014
Dissertation: Adaptive Forwarding in Named Data Networking
Advisor: Dr. Beichuan Zhang
GPA: 4.0
- M.S., Computer Science** May, 2010
- Tsinghua University**, Beijing, China
B.E., Computer Software July, 2005

RESEARCH INTERESTS

Network management, load balancing, high performance packet processing, Named Data Networking, routing and forwarding, congestion control, traffic engineering, green networking.

RESEARCH EXPERIENCE

- Routing and Forwarding in Named Data Networking** October, 2010 - August, 2014
Named Data Networking (NDN) shifts communication paradigm from host-centric to data-centric. This project studies the adaptive forwarding feature enabled by NDN's two-way symmetric traffic pattern. A novel forwarding strategy is designed to effectively handle network problems such as prefix hijacking, network failure as well as congestion. This project also investigates how NDN routing can benefit from adaptive forwarding.
- Green Traffic Engineering** May, 2009 - October, 2010
Today's networks are over-provisioned in order to handle bursty traffic. This project improves network energy efficiency by aggregating traffic onto fewer number of links during off-peak hours, so that unused network components can be put to sleep to conserve energy. Meanwhile, packet delay and link utilization are maintained at satisfactory levels to avoid performance degradation.
- Execution Time Measurement** (with Dr. Richard Snodgrass) August, 2008 - May, 2009
Measurement of program execution time is important in performance evaluation, but the results often exhibit large variation due to many factors. This project identifies major sources of the variation, and develops an efficient protocol for accurate execution time measurement in Linux.

PUBLICATIONS

Young-Kyoon Suh, Richard T. Snodgrass, John D. Kececioglu, Peter J. Downey, Robert S. Maier, and Cheng Yi, "EMP: Execution-Time Measurement Protocol for Compute-Bound Programs," *to appear in Software: Practice and Experience*, 2017.

Klaus Schneider, Cheng Yi, Beichuan Zhang, and Lixia Zhang, "A Practical Congestion Control Scheme for Named Data Networking," *Proceedings of ACM Conference on Information-Centric Networking*, September 2016.

Daniel E. Eisenbud, Cheng Yi, Carlo Contavalli, Cody Smith, Roman Kononov, Eric Mann-Hielscher, Ardas Cilingiroglu, Bin Cheyney, Wentao Shang, and Jinnah Dylan Hosein, "Maglev: A Fast and Reliable Software Network Load Balancer," *Proceedings of USENIX Symposium on Networked Systems Design and Implementation*, March 2016.

Alex Afanasyev, Cheng Yi, Lan Wang, Beichuan Zhang, and Lixia Zhang, "SNAMP: Secure Namespace Mapping to Scale NDN Forwarding," *Proceedings of IEEE Global Internet Symposium*, April 2015.

Cheng Yi, Jerald Abraham, Alexander Afanasyev, Lan Wang, Beichuan Zhang, and Lixia Zhang, "On the Role of Routing in Named Data Networking," *Proceedings of ACM Conference on Information-Centric Networking*, September 2014.

Sabah Currim, Richard T. Snodgrass, Young-Kyoon Suh, Rui Zhang, Matthew Wong, and Cheng Yi, "DBMS Metrology: Measuring Query Time," *Proceedings of the SIGMOD International Conference*, June 2013.

Cheng Yi, Alex Afanasyev, Ilya Moiseenko, Lan Wang, Beichuan Zhang, and Lixia Zhang, "A Case for Stateful Forwarding Plane," *Computer Communications: Information-Centric Networking Special Issue*, 36(7):779-791, 2013.

Cheng Yi, Alex Afanasyev, Lan Wang, Beichuan Zhang, and Lixia Zhang, "Adaptive Forwarding in Named Data Networking," *ACM SIGCOMM Computer Communication Review (CCR) (Editorial Note)*, 42(3):62-67, 2012.

Alexander Afanasyev, Cheng Yi, Lan Wang, Beichuan Zhang, and Lixia Zhang, "Scaling NDN routing," *NDN Technical Report NDN-0004*, July 2012.

Lan Wang, A K M Mahmudul Hoque, Cheng Yi, Adam Alyyan, and Beichuan Zhang, "OSPFN: An OSPF Based Routing Protocol for Named Data Networking," *NDN Technical Report NDN-0003*, July 2012.

Cheng Yi, Alexander Afanasyev, Ilya Moiseenko, Lan Wang, Beichuan Zhang, and Lixia Zhang, "Smart Forwarding: A Case for Stateful Data Plane," *NDN Technical Report NDN-0002*, July 2012.

Mingui Zhang, Cheng Yi, Bin Liu, and Beichuan Zhang, "GreenTE: Power-Aware Traffic Engineering," *Proceedings of the IEEE International Conference on Network Protocols (ICNP)*, October 2010 (awarded the Applied Networking Research Prize at IETF-81).

PRESENTATIONS "Maglev: A Fast and Reliable Software Network Load Balancer," QCon Beijing, April 2017 (awarded Star Speaker).
"On the Role of Routing in Named Data Networking," ACM Conference on Information-Centric Networking, September 2014.
"Eliminating Routing Churns with Adaptive Forwarding," NDN Seminar, October 2013.
"Adaptive Forwarding in Named Data Networking," NDN Project Retreat, October 2012.
"GreenTE: Power-Aware Routing," University of Arizona Computer Science Graduate Student Symposium, October 2009.

TEACHING EXPERIENCE **Department of Computer Science, University of Arizona, Tucson, AZ**
Teaching Assistant August, 2010 - December, 2010
CSc 372 Comparative Programming Languages.

HONORS AND AWARDS IEEE ICNP Student Travel Grant, 2013.
Computer Science Graduate Student Symposium Best Presentation Runner-up, 2009, University of Arizona.
College of Science Fellowship, 2008 - 2010, University of Arizona.

PROFESSIONAL
ACTIVITIES

Attended 13th USENIX Symposium on Network Systems Design and Implementation (NSDI), March 2016, Santa Clara, CA.

Attended 12th USENIX Symposium on Network Systems Design and Implementation (NSDI), May 2015, Oakland, CA.

Attended 1st ACM Conference on Information-Centric Networking (ICN), September 2014, Paris, France.

Attended 4th NDN Project Retreat, November 2013, University of California San Diego.

Attended 21st IEEE International Conference on Network Protocols (ICNP), October 2013, Göttingen, Germany.

Attended 3rd NDN Project Retreat, October 2012, University of California San Diego.

Attended 2nd NDN Project Retreat, January 2012, Colorado State University.

Attended 1st CCNxCon, 2011, Palo Alto Research Center.

Reviewer for *IEEE Transactions on Mobile Computing*, *IET Communications*, *Computer Communications*, *IEEE Communications Letters*, *IEEE/ACM Transactions on Networking*, *China Communications*, *Computer Communications: ICN Special Issue 2012*.

External Reviewer for *IEEE ISCC 2014*, *IFIP NETWORKING 2014*, *IEEE ICNP 2013*, *IEEE NOMEN 2013*, *IEEE INFOCOM 2013*, *IEEE INFOCOM 2011*, *IEEE GLOBECOM 2010*.

MEMBERSHIPS

Professional Member of ACM, IEEE and USENIX.

Member of Phi Kappa Phi.