

# ZACHARY SCOTT BISCHOF

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## RESEARCH INTERESTS

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Networking; distributed systems; Internet measurement; broadband networks; peer-to-peer systems.

## EDUCATION

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- **Ph.D., Computer Science** (December 2016)  
**Northwestern University**, Evanston, Illinois  
Advisor: Prof. Fabián E. Bustamante
- **M.S., Computer Science** (September 2013)  
**Northwestern University**, Evanston, Illinois  
Advisor: Prof. Fabián E. Bustamante  
GPA: 3.857/4.0
- **B.S., Computer Engineering** (June 2009)  
Japanese Language & Culture Minor  
**Northwestern University**, Evanston, Illinois  
GPA: 3.495/4.0

## EXPERIENCE

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- **Postdoctoral researcher.** IJ Innovation Institute Inc., Tokyo, Japan 2017 to present  
– Funded by the JSPS (日本学術振興会) Postdoctoral Fellowship
- **Adjunct lecturer.** EECS Department, Northwestern University, Evanston, IL Winter 2017  
– Taught *Intro to Computer Systems* (EECS 213)  
– Course textbook: *Computer Systems: A Programmer's Perspective*
- **Graduate research assistant.** AquaLab, Northwestern University, Evanston, IL 2009 to 2016  
– Advised by Prof. Fabián E. Bustamante  
– Conduct research related to broadband networks, Internet measurement, and distributed systems
- **Research intern.** Inria, Paris, France Summer 2015  
– Supervised by Renata Teixeira  
– Analyzed home network traffic and developed methods for identifying background traffic
- **Research intern.** Telefonica Research, Barcelona, Spain. Summer 2013  
– Supervised by Rade Stanojevic  
– Studied relationship between broadband markets and user behavior
- **Research intern.** IJ Innovation Institute Inc., Tokyo, Japan. Summer 2012  
– Supervised by Kenjiro Cho  
– Developed tool to monitor and analyze video streaming performance
- **Teaching assistant.** EECS Department, Northwestern University, Evanston, IL  
– Introduction to Computer Systems (EECS 213) Spring 2011, Spring 2012  
– Operating Systems (EECS 343) Fall 2013, Fall 2015  
– Distributed Systems (EECS 345) Winter 2013, Winter 2014, Spring 2015, Spring 2016  
– Responsible for grading assignments and projects, weekly recitations, and occasional lectures  
– Co-wrote/designed original course projects for Distributed Systems based on Kademlia in Go

- **Undergraduate research assistant.** Database Systems Laboratory, Northwestern 2007 to 2009
  - Funded by Northwestern Undergraduate Research Grant
  - Extended SIDnet-SWANS for simulations and experimentation

## PUBLICATIONS

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### Journal articles

- “Dasu: A measurement experimentation platform at the Internet’s edge.” Mario A. Sánchez, John S. Otto, Zachary S. Bischof, David R. Choffnes, Fabián E. Bustamante, Balachander Krishnamurthy, and Walter Willinger. In *IEEE/ACM Transactions on Networking (ToN)*, July 2014.
- “Up, Down and Around the Stack: ISP Characterization from Network Intensive Applications.” Zachary S. Bischof, John S. Otto, and Fabián E. Bustamante. *ACM SIGCOMM CCR Special Issue*, Volume 42 Issue 4, October 2012 (**W-MUST’12 best papers**). Originally published in *Proc. of ACM SIGCOMM Workshop on Measurements Up the Stack (W-MUST)*, August 2012.
- “Controlled Multi-Path Routing in Sensor Networks Using Bezier Curves.” O. Ghica, G. Trajcevski, P. Scheuermann, N. Valtchanov, Z. Bischof. *The Computer Journal* 2010.

### Refereed conference publications

- “The Growing Importance of Being Always On - A First Look at the Reliability of Broadband Services.” Zachary S. Bischof, Fabián E. Bustamante, and Nick Feamster. *Currently under submission*.
- “AMP up your mobile web experience: Benefits (and a hidden cost) of Accelerated Mobile Pages” Sung Yoon Whang, Zachary S. Bischof, and Fabián E. Bustamante. *Currently under submission*.
- “The utility argument – Making a case for broadband SLAs.” Zachary S. Bischof, Fabián E. Bustamante, and Rade Stanojevic. In *Proc. of PAM*, March 2017.
- “In and Out of Cuba - Characterizing Cuba’s Connectivity.” Zachary S. Bischof, John P. Rula, and Fabián E. Bustamante. In *Proc. of ACM IMC*, October 2015.
- “Second Chance: Understanding diversity in broadband access network performance.” John P. Rula, Zachary S. Bischof, Fabián Bustamante. In *Proc. of Sigcomm C2B(I)D Workshop*, August 2015
- “Need, Want, Can Afford – Broadband Markets and the Behavior of Users.” Zachary S. Bischof, Fabián E. Bustamante, and Rade Stanojevic. In *Proc. of ACM IMC*, November 2014. **Nominated for Best Paper Award.**
- “Dasu: Pushing Experiments to the Internet’s Edge.” Mario A. Sánchez, John S. Otto, Zachary S. Bischof, David R. Choffnes, Fabián E. Bustamante, Balachander Krishnamurthy, and Walter Willinger. In *Proc. of NSDI*. April 2013.
- “Trying broadband characterization at home.” Mario A. Sánchez, John S. Otto, Zachary S. Bischof, and Fabián E. Bustamante. In *Proc. of 14th Passive and Active Measurement Conference (PAM)*. March 2013.
- “Up, Down and Around the Stack: ISP Characterization from Network Intensive Applications.” Zachary S. Bischof, John S. Otto, and Fabián E. Bustamante. In *Proc. of ACM SIGCOMM Workshop on Measurements Up the Stack (W-MUST)*. August 2012. Also in *ACM SIGCOMM CCR Special Issue*, Volume 42 Issue 4, October 2012
- “Distributed Systems and Natural Disasters — BitTorrent as a Global Witness.” Zachary S. Bischof, John S. Otto, and Fabián E. Bustamante. In *Proc. of CoNEXT Special Workshop on the Internet and Disasters (SWID)*. December 2011.

- “Crowdsourcing ISP Characterization to The Network Edge.” Zachary S. Bischof, John S. Otto, Mario A. Sánchez, John P. Rula, David R. Choffnes, Fabián E. Bustamante. In Proc. of ACM SIGCOMM Workshop on Measurements Up the STack (W-MUST). August 2011.

## Refereed posters and demo papers

- “A Cliq of Content Curators.” Angela H. Jiang, Zachary S. Bischof, and Fabián E. Bustamante. ACM SIGCOMM, August 2014.
- “A Time for Reliability – The Growing Importance of Being Always On.” Zachary S. Bischof and Fabián E. Bustamante. ACM SIGCOMM, August 2014.
- “Characterizing Broadband Services with Dasu.” Zachary S. Bischof, Mario A. Sánchez, John S. Otto, John P. Rula, and Fabián E. Bustamante. Demo Session, USENIX NSDI, April 2013.
- “Experiments at the Internet’s Edge with Dasu” Mario A. Sánchez, John S. Otto, Zachary S. Bischof, David R. Choffnes, and Fabián E. Bustamante. Demo Session, USENIX NSDI, April 2013.
- “Dasu – ISP Characterization from the Edge.” Mario A. Sánchez, John S. Otto, Zachary S. Bischof, and Fabián E. Bustamante. ACM SIGCOMM 2011.
- “Range queries for mobile objects in wireless sensor networks.” G. Trajcevski, Z. Bischof, and P. Scheuermann. ACM SIGSPATIAL GIS 2009.
- “SIDnet-SWANS: a simulator and integrated development platform for sensor networks applications.” O. Ghica, G. Trajcevski, P. Scheuermann, Z. Bischof, and N. Valtchanov. ACM SenSys 2008.

## PROJECTS

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- Namehelp: An application that improves web performance when using a remote DNS service. <http://aqualab.cs.northwestern.edu/projects/namehelp>
- Dasu: An extension to the Vuze BitTorrent client that characterizes multiple aspects of ISP performance (such as bandwidth, latency, and DNS performance) through the use of both active and passive measurements. <http://aqualab.cs.northwestern.edu/projects/Dasu.html>
- NEWSight: NEWSight is a tool for visualizing network anomalies across different periods of time and regions of the network. NEWSight gathers its anomaly information from the NEWS (Network Early Warning System) plugin for the Vuze BitTorrent client, which finds network problems by passively monitoring BitTorrent performance and checking for changes that might indicate problems with the network.

## SKILLS AND EXPERTISE

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- Primary programming languages: C, Go, Python
- Extensive experience with: Assembly (IA-32, AMD64 and 8051), C++, Java, Javascript, Perl, PHP, Racket/Scheme, Ruby, SQL, VHDL
- Revision control: Mercurial, Git
- Large-scale data analysis: Hadoop, Pig, & Dumbo (a Python interface for Hadoop)
- Proficient in Japanese

## HONORS AND AWARDS

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- Japan Society for the Promotion of Science (日本学術振興会) Postdoctoral Fellowship 2017-2019
- Terminal Year Fellowship Award, Northwestern University 2016
- Nominated for Best Paper Award, ACM Internet Measurement Conference 2014
- Best Paper Award, ACM SIGCOMM Workshop on Measurement Up and Down the STack 2012
- Invited Panelist, ACM SIGCOMM Workshop on Measurement Up and Down the STack 2012
- Walter P. Murphy Graduate Fellowship; Northwestern University 2009-2010
- Undergraduate Research Grant; Northwestern University Summer 2007

## CETERA

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- US Citizen
- Co-organizer of “Systems Reading Group” (SRG) at Northwestern (2011 to 2013)
- Coordinator for “Graduate Research Seminar in CS & CE” at Northwestern (2010 to 2011)