

Danyang Zhuo

Assistant Professor
Department of Computer Science
Trinity College of Arts and Sciences
Duke University

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Research Interests

I do research broadly in computer systems, including operating systems, distributed systems, and computer networks, with a focus on the design and implementation of data center systems to support today's increasingly data-intensive applications. My current research includes cloud operating systems that support efficient and flexible containerization, high-performance distributed data-processing systems, and correct and efficient middleboxes and network function virtualization.

Education

- **University of Washington – Seattle** Seattle, Washington
Ph.D. in Computer Science and Engineering *Sep 2013 - Aug 2019*
 - Dissertation: Practical, Efficient, and Reliable Data Center Communication.
 - Advisors: Thomas E. Anderson, Arvind Krishnamurthy
- **University of Illinois – Urbana Champaign** Urbana, Illinois
B.S. in Electrical Engineering *Aug 2009 - May 2013*
 - Advisor: Nitin Vaidya

Professional Experience

- **Duke University** Durham, North Carolina
Assistant Professor of Computer Science *Jul 2020 - now*
- **University of California – Berkeley** Berkeley, California
Postdoctoral Researcher *Sep 2019 - Jun 2020*
 - Advisor: Ion Stoica
- **Microsoft Research** Redmond, Washington
Contractor (through Populous Group) *Oct 2015 - Feb 2017*
- **Microsoft Research** Redmond, Washington
Research Intern *Jun 2015 - Sep 2015*
- **Google** Mountain View, California
Software Development Engineering Intern *Sep 2014 - Mar 2015*
- **Amazon** Seattle, Washington
Software Development Engineering Intern *May 2013 - Sep 2013*
- **Microsoft** Redmond, Washington
Software Development Engineering Intern *May 2012 - Aug 2012*

Publications

Conference Papers

1. Lianmin Zheng, Chengfan Jia, Minmin Sun, Zhao Wu, Cody Hao Yu, Ameer Haj-Ali, Yida Wang, Jun Yang, **Danyang Zhuo**, Koushik Sen, Joseph E. Gonzalez, Ion Stoica. *Ansor: Generating High-Performance Tensor Programs for Deep Learning*. The 14th USENIX Symposium on Operating Systems Design and Implementation (OSDI), 2020.
2. Kaiyuan Zhang, **Danyang Zhuo**, Arvind Krishnamurthy. *Gallium: Automated Software Middlebox Offloading to Programmable Switches*. In Proceedings of the Conference of the ACM Special Interest Group on Data Communication (SIGCOMM), 2020.
3. Kaiyuan Zhang, **Danyang Zhuo**, Aditya Akella, Arvind Krishnamurthy, Xi Wang. *Automated Verification of Customizable Middlebox Properties with Gravel*. The 17th USENIX Symposium on Networked Systems Design and Implementation (NSDI), 2020.
4. **Danyang Zhuo**, Kaiyuan Zhang, Yibo Zhu, Hongqiang Harry Liu, Matthew Rockett, Arvind Krishnamurthy, Thomas Anderson. *Slim: OS Kernel Support for a Low-Overhead Container Overlay Network*. The 16th USENIX Symposium on Networked Systems Design and Implementation (NSDI), 2019.
5. **Danyang Zhuo**, Monia Ghobadi, Ratul Mahajan, Klaus-Tycho Förster, Arvind Krishnamurthy and Thomas E. Anderson. *Understanding and Mitigating Packet Corruption in Data Center Networks*. In Proceedings of the Conference of the ACM Special Interest Group on Data Communication (SIGCOMM), 2017.
6. **Danyang Zhuo**, Monia Ghobadi, Ratul Mahajan, Amar Phanishayee, Xuan Kelvin Zou, Hang Guan, Arvind Krishnamurthy and Thomas E. Anderson. *RAIL: A Case for Redundant Arrays of Inexpensive Links in Data Center Networks*. The 14th USENIX Symposium on Networked Systems Design and Implementation (NSDI), 2017.
7. Vincent Liu, **Danyang Zhuo**, Simon Peter, Arvind Krishnamurthy and Thomas E. Anderson. *Subways: A Case for Redundant, Inexpensive Data Center Edge Links*. The 13th International Conference on emerging Networking EXperiments and Technologies (CoNEXT), 2015.

Workshop Papers

1. Samantha Miller, Kaiyuan Zhang, **Danyang Zhuo**, Shibin Xu, Arvind Krishnamurthy, Thomas Anderson. *Practical Safe Linux Kernel Extensibility*. The 17th Workshop on Hot Topics in Operating Systems (HotOS), 2019.
2. **Danyang Zhuo**, Qiao Zhang, Xin Yang, Vincent Liu. *Canaries in the Network*. The 15th ACM Workshop on Hot Topics in Networks (HotNets), 2016.
3. **Danyang Zhuo**, Qiao Zhang, Vincent Liu, Arvind Krishnamurthy, Thomas E. Anderson. *Rack-level Congestion Control*. The 15th ACM Workshop on Hot Topics in Networks (HotNets), 2016.
4. **Danyang Zhuo**, Qiao Zhang, Dan Ports, Arvind Krishnamurthy, Thomas E. Anderson. *Machine Fault Tolerance for Reliable Datacenter Systems*. The 5th Asia-Pacific Workshop on Systems (APSys), 2014.

Patents

1. Monia Ghobadi, Ratul Mahajan, Amar Phanishayee, **Danyang Zhuo**, Xuan Kelvin Zou. *Data Center Topology Having Multiple Classes of Reliability*. US Patent 20170302565A1. WIPO Patent 2017180450A1.

Students

Current PhD Students

Jingrong Chen (2020-), Guozhen She (2020-), Xinhao Kong (2021-)

Awards

University of Washington Madrona Prize Runner-Up 2018
University of Washington Hacherl Endowed Fellowship 2013 - 2014
Rank 146th in the William Lowell Putnam Mathematical Competition 2012

Invited Talk

- **Towards Efficient and Reliable Data Center Systems.**
 - Yale University Apr 2019
 - Purdue University Apr 2019
 - University of Virginia Mar 2019
 - Duke University Mar 2019
 - Rutgers University Mar 2019
 - Microsoft Research Mar 2019
 - Penn State University Feb 2019
 - University of Minnesota Feb 2019
- **Slim: OS Kernel Support for a Low-Overhead Container Overlay Network.**
 - Princeton University Jun 2020
 - USENIX NSDI Feb 2019
- **Understanding and Mitigating Packet Corruption in Data Center Networks.**
 - ACM SIGCOMM Aug 2017
- **RAIL: A Case for Redundant Arrays of Inexpensive Links in Data Center Networks.**
 - USENIX NSDI Mar 2017

Teaching

- **CPS 510: Advanced Operating Systems. (Fall 2020)**

Service

Program Committee

- SIGCOMM (2020)