

# Danyang Zhuo

Assistant Professor  
Department of Computer Science  
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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 (e.g., deep learning, big data analytics, packet processing). My approaches include software architecture design, programming languages, and machine learning.

## 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. Sitan Chen, Xiaoxiao Li, Zhao Song, **Danyang Zhuo**. *On InstaHide, Phase Retrieval, and Sparse Matrix Factorization*. The 9th International Conference on Learning Representations (ICLR), 2021.
2. Samantha Miller, Kaiyuan Zhang, Mengqi Chen, Ryan Jennings, Ang Chen, **Danyang Zhuo**, Thomas Anderson. *High Velocity Kernel File Systems with Bento*. The 19th USENIX Conference on File and Storage Technologies (FAST), 2021.  
**Best Paper Award.**
3. 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.
4. 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.
5. 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.
6. **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.
7. **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.
8. **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.
9. 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

FAST Best Paper Award	2021
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
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- **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)