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 (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. 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.

2. 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.

3. 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.

4. 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.

5. **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.

6. **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.

7. **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.

8. 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)