Doug Woos

✉ *doug.woos@gmail.com*
www.dougwoos.com

Short Bio

I'm a computer scientist and a software engineer, with experience in both academia and the technology industry. My core strengths are (1) building reliable and scalable systems and (2) communicating complex ideas to audiences with a wide range of backgrounds. I have developed these strengths over ten years of software development, academic research, and teaching. I'm currently seeking a software engineering role at a mission-driven company working on climate technology.

Employment

2019–2021 **Lecturer in Computer Science**, *Brown University*, Providence, RI.
- Developed and taught introductory and upper-level computer science classes
- Managed large, diverse teaching assistant staffs

2016 **PhD Intern**, *Microsoft Research*, Redmond, WA.
- Studied unreliable performance of SMT solver-based software verification
- Developed a technique to speed up solver performance by discarding irrelevant facts

2013–2019 **Research + Teaching Assistant**, *University of Washington*, Seattle, WA.

Selected research projects:
- A novel operating system for datacenters (team member)
- A framework for formally verifying distributed systems (team co-lead)
- First formally verified implementation of the Raft consensus algorithm (team co-lead)
- A formal semantics of the Border Gateway Protocol (team member)
- A graphical step-through debugger for distributed systems (solo project, dissertation)

2011-2013 **Engineer**, *Gamechanger Media*, New York, NY.
- Developed cloud (AWS)-based infrastructure for storing and querying sports data
- Developed APIs in Python and Javascript (Node)

Education

2013–2019 **PhD**, *University of Washington*, Seattle, WA.

Computer Science and Engineering. Dissertation: "A step-through debugger for distributed systems"

2013–2015 **Master of Science**, *University of Washington*, Seattle, WA.

Computer Science and Engineering

2007–2011 **Bachelor of Arts**, *Swarthmore College*, Swarthmore, PA.

Honors Major Computer Science, Honors Minor Mathematics, Course Minor Philosophy

Favorite programming languages

C, Clojure, Gallina, OCaml, Python, Rust, Typescript

Teaching

All courses taught at Brown University unless otherwise noted.

Spring 2021 **Compilers and Program Analysis (CSCI 1260)**.

Spring 2020, Summer 2021 **Introduction to Algorithms and Data Structures (CSCI 0160)**.
co-taught with Seny Kamara in Spring 2020

Spring 2020, Fall 2020 **Computing Foundations: Program Organization (CSCI 0112)**.

Fall 2019, Fall 2020 **Computing Foundations: Data (CSCI 0111)**.
co-taught with Kathi Fisler in Fall 2020

Spring 2017 **Distributed Systems (CSE 452)**, *University of Washington*.

Awards and Honors

Apr 2015 **NSF Graduate Research Fellowship**.

Oct 2014 **Madrona Prize for Best Student Poster**, *UW CSE Industry Affiliates Meeting*.
Arrakis: The Operating System is the Control Plane

Oct 2014 **Best Paper**, *OSDI 2014*.
Arrakis: The Operating System is the Control Plane

Apr 2014 **NSF Graduate Research Fellowship Honorable Mention**.

Preprints

[1] Doug Woos, Zachary Tatlock, Michael D. Ernst, and Thomas E. Anderson. "A Graphical Interactive Debugger for Distributed Systems". ArXiv preprint. June 2018.

Conference Publications

[1] Josh Pollock, Jared Roesch, Doug Woos, and Zachary Tatlock. "Theia: Automatically Generating Correct Program State Visualizations". In: *SPLASH-E 2019*. Oct. 2019.

[2] Ellis Michael, Doug Woos, Thomas Anderson, Michael D. Ernst, and Zachary Tatlock. "Teaching Rigorous Distributed Systems With Efficient Model Checking". In: *Eurosys 2019*. June 2019.

[3] Marcelo Taube, Giuliano Losa, Kenneth L McMillan, Oded Padon, Mooly Sagiv, Sharon Shoham, James R Wilcox, and Doug Woos. "Modularity for Decidability of Deductive Verification with Applications to Distributed Systems". In: *PLDI 2018*. June 2018.

[4] Konstantin Weitz, Doug Woos, Emina Torlak, Michael D. Ernst, Arvind Krishnamurthy, and Zachary Tatlock. "Scalable Verification of Border Gateway Protocol Configurations with an SMT Solver". In: *OOPSLA 2016*. Oct. 2016.

[5] Doug Woos, James R. Wilcox, Steve Anton, Zachary Tatlock, Michael D. Ernst, and Thomas Anderson. "Planning for Change in a Formal Verification of the Raft Consensus Protocol". In: *CPP 2016*. Jan. 2016.

[6] James R. Wilcox, Doug Woos, Pavel Panchekha, Zachary Tatlock, Xi Wang, Michael D. Ernst, and Thomas Anderson. "Verdi: A Framework for Implementing and Verifying Distributed Systems". In: *PLDI 2015*. June 2015.

[7] Simon Peter, Jialin Li, Irene Zhang, Dan R. K. Ports, Doug Woos, Arvind Krishnamurthy, Thomas Anderson, and Timothy Roscoe. "Arrakis: The Operating System is the Control Plane". In: *OSDI 2014*. Oct. 2014.

[8] Simon Peter, Umar Javed, Qiao Zhang, Doug Woos, Thomas Anderson, and Arvind Krishnamurthy. "One Tunnel is (Often) Enough". In: *SIGCOMM 2014*. July 2014.

[9] Simon Peter, Jialin Li, Doug Woos, Irene Zhang, Dan R. K. Ports, Thomas Anderson, Arvind Krishnamurthy, and Mark Zbikowski. "Towards High-Performance Application-Level Storage Management". In: *HotStorage 2014*. June 2014.

[10] Tia Newhall and Douglas Woos. "Incorporating Network RAM and Flash into Fast Backing Store for Clusters". In: *IEEE Cluster 2011*. Sept. 2011.

Journal Publications

[1] Simon Peter, Jialin Li, Irene Zhang, Dan R. K. Ports, Doug Woos, Arvind Krishnamurthy, Thomas Anderson, and Timothy Roscoe. "Arrakis: The Operating System is the Control Plane". In: *ACM ToCS*. Vol. 33(4). Nov. 2015.

Workshop Publications

[1] Ryan Doenges, James R. Wilcox, Doug Woos, Zachary Tatlock, and Karl Palmskog. "Verification of Implementations of Distributed Systems Under Churn". In: *CoqPL 2017*. Jan. 2018.

[2] Konstantin Weitz, Doug Woos, Emina Torlak, Michael D. Ernst, Arvind Krishnamurthy, and Zachary Tatlock. "Formal Semantics and Automated Verification for the Border Gateway Protocol". In: *NetPL 2016*. Aug. 2016.