

DIEGO ONGARO

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Education

Stanford University—Stanford, CA

Doctor of Philosophy in Computer Science: 2009–2014

Master of Science in Computer Science: 2009–2012

- Dissertation project: the Raft consensus algorithm
- Advisor: John Ousterhout

Rice University—Houston, TX

Bachelor of Arts in Computer Science: 2006–2009

Work Experience

Stealth Startup—Seattle, WA (remote)

Founding Engineer: December 2022–January 2024

- Developed a secure, scalable, fault-tolerant service combining specialized hardware and cloud computing
- Worked in areas of distributed systems, security, cryptography, embedded systems

HomeX—San Francisco, CA (remote)

Principal Engineer: May 2019–October 2020

- Developed dispatch board that optimized technician assignment and routing.

eBay—San Francisco, CA

Architect, Structured Data: August 2017–April 2019

- Designed and implemented fault-tolerant knowledge graph store, which scales out in its capacity and query rates and uses a logically central log to simplify coordination.
- Implemented a cost-based query optimizer for SPARQL-like queries, a transaction mechanism, etc.

Salesforce—San Francisco, CA

Lead Software Engineer, Compute Infrastructure: July 2015–August 2017

- Developed prototype of an Apache ZooKeeper-compatible coordination system called Ark, using the HashiCorp Raft library.
- Helped design a cache with complex concurrency requirements for an internal LSM-based database, resulting in a software patent. Applied Runway to create a specification and verify its correctness.
- Designed and implemented Runway, a tool for distributed systems design. It enables interactive visualization, specification, simulation, and model checking.
- Developed prototype for transparent encryption of datacenter networking, including benchmarking of various approaches. Obtained higher throughput than TLS for a single connection using parallel encryption of larger blocks.

Scale Computing—San Francisco, CA

Software Engineer Contractor: November 2014–July 2015

- Prepared LogCabin for production use. Fixed several important bugs. Made LogCabin easier to operate and issues easier to diagnose. Implemented rolling upgrades.

Facebook—Palo Alto, CA

Software Engineer Intern: Summer 2011

Citrix Systems R&D (XenSource)—Cambridge, UK

Software Engineer Intern: Summer 2008

Essential Technology Solutions, LLC—The Woodlands, TX

Developer: 2004–2008

Research Experience

Raft Consensus Algorithm—Stanford University

With John Ousterhout: 2012–2014

- Developed distributed consensus algorithm to be easy to understand.
- Implemented Raft in the LogCabin coordination system.
- Conducted user study to show that Raft is easier to understand than Paxos. Proved Raft's correctness and evaluated its leader election and log replication performance.
- Raft is now taught at over 15 universities, including Harvard, MIT, and Princeton.
- It is used in many open-source coordination and database systems, including CockroachDB, Consul, Dgraph, etcd, InfluxDB, Neo4j, and TiKV.

RAMCloud Low-Latency Datacenter Storage—Stanford University

With John Ousterhout, Ryan Stutsman, Stephen Rumble, et al: 2009–2012

- RAMCloud is a high-performance distributed key-value storage system featuring 5 microsecond read latency and 1 second crash recovery.
- Contributed to the overall design and implementation, especially the RPC system and fast crash recovery aspects.

Virtualized I/O Performance—Rice University

With Alan L. Cox and Scott Rixner: 2007–2008

- Analyzed and improved Xen's architecture for CPU scheduling and network I/O.

Selected Publications

J. Ousterhout, A. Gopalan, A. Gupta, A. Kejriwal, C. Lee, B. Montazeri, D. Ongaro, S. J. Park, H. Qin, M. Rosenblum, S. M. Rumble, R. Stutsman, and S. Yang. The RAMCloud Storage System. *ACM Transactions on Computer Systems (TOCS)*, Sept. 2015.

D. Ongaro. Consensus: Bridging Theory and Practice. *Stanford University PhD Dissertation*, Aug. 2014.

D. Ongaro, J. Ousterhout. In Search of an Understandable Consensus Algorithm (Raft). *USENIX Annual Technical Conference (ATC)*, 2014. *Best Paper Award*.

D. Ongaro, S. M. Rumble, R. Stutsman, J. Ousterhout and M. Rosenblum. Fast Crash Recovery in RAMCloud. *ACM Symposium on Operating Systems Principles (SOSP)*, 2011.

J. Ousterhout, D. Ongaro, M. Rosenblum, S. M. Rumble, R. Stutsman, et al. The Case for RAMCloud. *Communications of the ACM (CACM)*, July 2011.

D. Ongaro, A. L. Cox, and S. Rixner. Scheduling I/O in Virtual Machine Monitors. *ACM International Conference on Virtual Execution Environments (VEE)*, 2008.