

Shoumik Palkar

Curriculum Vitae

21104 Tulita Ct.
Cupertino, CA 95014
☎ +1 (408) 505 6159
✉ shoumik@cs.stanford.edu

Research Interests

Computer systems, big data, networking

Education

2016–Present **PhD Candidate**, *Computer Science*, Stanford University, Stanford, CA.

Advisor: Prof. Matei Zaharia.

2015–2016 **PhD Candidate**, *Computer Science*, Massachusetts Institute of Technology, Cambridge, MA.

Advisor: Prof. Matei Zaharia.

Transferred to Stanford University in Fall 2016 with advisor.

2011–2014 **Bachelor of Science**, *Computer Science and Engineering*, University of California at Berkeley, Berkeley, CA.

Advisors: Profs. Scott Shenker and Sylvia Ratnasamy.

Research Projects

Weld: A Common Runtime for High Performance Data Analytics

Shoumik Palkar, James Thomas, Anil Shanbhag, Deepak Narayanan, Malte Schwarzkopf, Anil Shanbhag, Holger Pirk, Saman Amarasinghe, Sam Madden, and Matei Zaharia.

- Weld is an intermediate language for data parallel programs. Writing fast, efficient parallel code is growing increasingly difficult as hardware becomes more complex, while frameworks like MapReduce and Spark have shown that many common workloads are expressible using only functional, parallel APIs. Weld exposes a small set of parallel primitives that can express many of these existing workloads, performs programmatic transformations to optimize their execution, and generates high performance machine code for a variety of backends.

E2: A Framework for Network Functions Virtualization.

Shoumik Palkar, Chang Lan, Sangjin Han, Keon Jang, Aurojit Panda, Sylvia Ratnasamy, Luigi Rizzo, and Scott Shenker.

- E2 is a system that provides a framework for NFV, responsible for dynamic scaling of network functions (NFs), load balancing traffic between nodes, and orchestrating service composition given a network policy. E2 manages a hardware cluster composed of a commodity switching ASIC and a rack of x86 servers.

SoftNIC: A Software NIC to Augment Hardware

Sangjin Han, Keon Jang, Aurojit Panda, **Shoumik Palkar**, Dongsu Han, and Sylvia Ratnasamy.

- SoftNIC is a system built to perform complex Network Interface Card functionality in software with a programmable pipeline, at 40 and 100 Gbps rates, while offloading computation to the NIC hardware opportunistically.

SDNv2

Murphy McCauley et al.

- SDNv2 is a proposed internet architecture that allows ISPs to leverage commodity CPUs at the network edge for greater flexibility in deploying network services.

Teaching Experience

Winter 2017 **TA for CS 149 (Parallel Computing)**, *Stanford University*, Stanford, CA.

Fall 2014 **TA for CS 168 (Undergraduate Networking)**, *UC Berkeley*, Berkeley, CA.

- Taught about 50 students in a weekly discussion section.
- Designed problem sets, graded exams, and co-managed two projects involving building an application-layer firewall in Python.

Professional Experience

Summer 2016 **SWE Intern**, *Google Inc.*, Mountain View, CA.

- Studied and implemented several Conflict-Free Replicated Data Types (CRDTs) on top of a P2P database called Syncbase.

Summer 2014 **Undergraduate Researcher**, *International Computer Science Institute*, Berkeley, CA.

- Designed and implemented E2, a framework for efficiently managing and deploying a NFV cluster on commodity hardware.

Summer 2013 **SDE Intern**, *VMware Inc.*, Palo Alto, CA.

- Developed and tested a distributed L7 Firewall in the VMware ESX hypervisor kernel.

Winter 2013 **Mobile Application Developer**, *El Camino Hospital*, Mountain View, CA.

- Developed an iOS application for to coordinate a raffle at an event. Integrated Amazon SimpleDB and Facebook Graph APIs.

Summer 2012 **Software Engineering Intern**, *Cooliris Inc.*, Palo Alto, CA.

- Designed and developed *HashGallery*, an iOS client for Instagram, Twitter, and Flickr image search.

Honors and Awards

2016 **NSF GRFP Honorable Mention.**

2015–2016 **Jacobs Presedential Fellowship.**

Publications

Conferences

- [1] Shoumik Palkar, James Thomas, Anil Shanbhag, Deepak Narayanan, Holger Pirk, Malte Schwarzkopf, Saman Amarasinghe, and Matei Zaharia. *Weld: A Common Runtime for High Performance Data Analytics*. CIDR '17, Chaminade, CA, USA, 2017.
- [2] Shoumik Palkar, Chang Lan, Sangjin Han, Keon Jang, Aurojit Panda, Sylvia Ratnasamy, Luigi Rizzo, and Scott Shenker. *E2: A Framework for NFV Applications*. SOSP '15, Monterey, CA, USA, 2015.

Technical Reports

- [3] Sangjin Han, Keon Jang, Aurojit Panda, Shoumik Palkar, Dongsu Han, and Sylvia Ratnasamy. *SoftNIC: A Software NIC to Augment Hardware*. Technical Report UCB/EECS-2015-155, EECS Department, University of California, Berkeley, May 2015.

References

Available upon request.