Chinmay Kulkarni (www.chinmayk.net)

Education

University of Utah ..... Salt Lake City, USA
Doctor of Philosophy in Computer Science, May 2021
Dissertation: Reconfiguration and Extensibility for Low-Latency Key-Value Stores
Advised by Prof. Ryan Stutsman

Indian Institute of Technology Bombay ..... Bombay, India
Master of Technology in Computer Science, August 2016
Thesis: Mitigating Busy Waiting in SMP Virtual Machines
Advised by Prof. Purushottam Kulkarni

National Institute of Technology ..... Surathkal, India
Bachelor of Technology in Electronics and Communication, November 2013

Awards

Google PhD Fellowship, *Systems and Networking, 2019*

Experience

ConductorOne ..... Remote, Salt Lake City, USA
Staff Software Engineer, Product Team, November 2023 - Present

Lightstep (acquired by Servicenow) ..... Remote, Salt Lake City, USA
Senior Software Engineer, Data Platform Team, June 2021 - November 2023
Member of the data platform and query experience teams. Worked on Lightstep's in-house time-series databases, query engine, query language, and public APIs (for spans, metrics, and traces).

Notable projects:

1. Led a project to build a service-graph-connector for OpenTelemetry. Designed and built an API that queries spans and metrics telemetry to determine the set of kubernetes resources running within a customers' environment. Generated multiple million dollars of pipeline across many big name enterprise customers for Lightstep. When released on the ServiceNow store, broke the record for the most downloaded connector.
2. Led a project to build a query logging system to identify queries of death. Paired with teammate for the implementation. Reduced incident MTTR from hours to minutes. Logger is also now used to guide improvements to the query layer. Logger also powers key product feature that allows customers to reduce cost by identifying unused timeseries.
3. Worked on a team to migrate data from spanner into an in-house database. Designed and built a fault-tolerant, idempotent, highly-concurrent, distributed ETL job for the migration. Validated data post-migration. Helped root cause and fix issues caused by the migration. Reduced yearly operating cost by 0.5 million dollars.
4. Made contributions to the query engine and language including support for template variables etc. Sheparded tweaks to cluster autoscaler, reducing yearly operating cost by 1 million dollars. Built dashboards to measure unit margins. Embedded within product team to implement product features for alerting.

University of Utah ..... Salt Lake City, USA
Google Ph.D Fellow, August 2019 - May 2021
Designed, implemented, and evaluated a new distributed key-value store called Shadowfax. Shadowfax can serve 130 Million updates per second on Azure virtual machines, can span local as well as remote cloud storage, and can scale out in under 20 seconds. Work published at VLDB '21.

Research Assistant advised by Ryan Stutsman, August 2016 - May 2019
Designed, implemented, and evaluated mechanisms for reconfiguration and extensibility in low-latency key-value stores. Work published at SOSP '17 and OSDI '18.

Google ..... Sunnyvale, USA
Research Intern hosted by Larry Kai, May 2020 - August 2021
Worked on defining and measuring the availability of Google services. Designed and built a dashboard that Google engineers can use to visualize and monitor the availability of their service.

VMware ..... Palo Alto, USA
Research Intern hosted by Gerd Zellweger, May 2019 - August 2019
Designed, built, tested and evaluated a Rust library that constructs a highly scalable, linearizable, concurrent data structure from a single threaded implementation.

Microsoft ..... Redmond, USA
Research Intern hosted by Badrish Chandramouli, May 2018 - August 2018
Worked on an RPC layer and scale out protocol for FASTER, a key-value store that scales linearly across cores to service 160 million updates per second.

Cisco Systems ..... Bangalore, India
Software Development Engineer, August 2013 - December 2013
Worked with the core switching - platforming team. Also involved with the development of the inband, datapath and env components of the Cisco Catalyst 6K series of switches.

Software Development Intern, May 2012 - August 2012
Worked on Openstack and Openflow plugins for the Cisco Catalyst 6K series of switches.

Publications

Achieving High Throughput and Elasticity in a Larger-than-Memory Store **VLDB 2021**
Chinmay Kulkarni, Badrish Chandramouli, and Ryan Stutsman
Collaboration with Microsoft

NrOS: Effective Replication and Sharing in an Operating System **OSDI 2021**
Ankit Bhardwaj, **Chinmay Kulkarni**, Reto Achermann, Irina Calciu, Sanidhya Kashyap, Ryan Stutsman, Amy Tai, and Gerd Zellweger
Collaboration with VMware

Adaptive Placement for In-memory Storage Functions **ATC 2020**
Ankit Bhardwaj, **Chinmay Kulkarni**, and Ryan Stutsman

Splinter: Bare-Metal Extensions for Multi-Tenant Low-Latency Storage **OSDI 2018**
Chinmay Kulkarni, Sara Moore, Mazhar Naqvi, Tian Zhang, Robert Ricci, and Ryan Stutsman

Rocksteady: Fast Migration for Low-latency In-memory Storage **SOSP 2017**
Chinmay Kulkarni, Aniraj Kesavan, Tian Zhang, Robert Ricci, and Ryan Stutsman

Beyond Simple Request Processing with RAMCloud **IEEE DEB 40(1)**
Chinmay Kulkarni, Aniraj Kesavan, Robert Ricci, and Ryan Stutsman

Benchmarking Multiprocessing Parameters in a Virtualized Multi-Core Environment
Chinmay Kulkarni and Purushottam Kulkarni **IIT Bombay Technical Report**

Open Source

microsoft/FASTER **vmware/node-replication** **utah-scs/splinter**

Talks and Posters

Achieving High Throughput and Elasticity in a Larger-than-Memory Store
VLDB 2021, Copenhagen, Denmark

Reconfiguration and Extensibility for Low-Latency Key-Value Stores
PhD Defense, 2021, University of Utah, Salt Lake City, Utah, USA

Scaling an Operating System to Many Cores Using a System Call Log
SOSP 2019 (Poster), Huntsville, Ontario, Canada

Raising The Efficiency of μStorage
Google PhD Fellowship Summit 2019, Mountain View, California, USA

Splinter: Bare-Metal Extensions for Multi-Tenant Low-Latency Storage
OSDI 2018, Carlsbad, California, USA

Rocksteady: Fast Migration for Low-latency In-memory Storage
SOSP 2017, Shanghai, China

SERVICE **JSys** (Student Editor, 2021), **HotCloud '20** (External Reviewer)

SKILLS Go, Rust, Python, R, C++, Kubernetes, Kernel-bypass networking, Lock-free programming