Sundaram Ananthanarayanan

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Summary

An infrastructure engineer with great passion for performance and scalability. Most recently I have been working on a highly scalable, low-latency stateful task execution system that handles Uber's CI workloads. Before that, I researched extensively on techniques to guarantee ACID like properties for large monorepos and built a state-of-the-art system utilized by 3000+ services and 10+ apps at Uber.

Working Experience

- **Uber** — San Francisco, CA
  Senior Software Engineer II — *May 2016 - Present*
  - **SubmitQueue**: 1000s of engineers committing changes concurrently to a repository leads to frequent master breakages. Explored & conceived a new system that guarantees an **always-green** master. At Uber, *SubmitQueue* handles 1000s of commits/hr submitted by 1000s of engineers every day.
    - **Led a team of 5 engineers to build the system:** reading papers on state-of-the-art techniques used in similar domains such as Databases, experimented with various approaches to find a scalable solution, & architected the system to handle 1000s of changes/hr.
    - Improved the shippability of an average service from *52% to 100%* while keeping the maximum overhead at 20 minutes to commit a change.
    - Published a research paper presenting the design & implementation of *SubmitQueue* at **Eurosys'19**. Adrian Coyler has covered it as part of *the morning paper*.
  - **uCI**: Because existing open-source CI systems such as Jenkins do not scale to Uber's needs, I conceived & designed *uCI*- a large-scale distributed system to handle reliable execution of millions of stateful tasks every day on 1000s of CI machines.
    - Leading a team of 6 engineers to design a state-of-the-art cluster scheduler that exploits data locality, SLO budgets to come up with near-optimal placements.
    - Designed the system leveraging existing open-source technologies such as Apache Mesos for cluster management, Cadence for workflow orchestration & Docker for executing tasks in a containerized environment.
- **Baidu Research Silicon Valley AI Lab** — Sunnyvale, CA
  Software Engineer — *Jan 2016 - May 2016*
  - **Speech Infrastructure**: Designed & productionized deep-learning based Speech Recognition APIs which power Android apps such as TalkType. Also worked on infrastructure that would suggest words as you speak (e.g, world level suggestion [word, wide]) .
- **Twitter Inc** — San Francisco, CA
  Software Engineer — *Jun 2014 - Jan 2016*
  - **AddressBook Infrastructure**: System for storing, retrieving contacts stored on the phone-book of Twitter's 300M+ MAUs. It was used in powering features such as *Who To Follow* aimed at user increasing engagement. Designed a scalable offline infrastructure that periodically reconciled the 1PB+ HDFS snapshot with updates by exploiting algebraic structures such as Monoids.

Ancient History

- **Stanford University** — Stanford, CA
  Master of Science in Electrical Engineering; GPA: 3.9/4.0 — *Sep. 2012 – Jun. 2014*
- **Microsoft** — Redmond, WA
  Software Engineering Intern, Kernel Core Team — *Jun 2013 - Sep 2013*
- **Google Summer of Code** — Chennai, India
  Worked on Metalink Support for Google Chrome — *Jun 2012 - Sep 2012*
- **College of Engineering, Guindy, Anna University** — Chennai, India
  Bachelor of Engineering in Information Technology; GPA: 9.32/10.0 — *Aug. 2008 – June. 2012*
- **University of Waterloo** — Waterloo, Canada
  Research Intern - Worked on design & application of One-Instruction Processors — *Apr. 2011 – June. 2011*

Talks

- **Keeping Master Green at Scale: sundaram.io/slides/submitqueue.pdf**
  - *Google Journal Club, May 2019* — San Francisco, CA
  - *Eurosys'19, March 2019* — Dresden, Germany
  - *Facebook, Jan 2019* — Menlo Park, CA

Skills

- **Languages**: Java, Scala, C++, Bash, SQL
- **Specialities**: distributed systems, graph theory, algorithms, machine learning, performance tuning and debugging