Aneesh Durg

Email: aneeshdurg17@gmail.com | Website: `aneeshdurg.me` | Github: `github.com/aneeshdurg`

WORK EXPERIENCE

Senior Software Engineer/Team Lead Feb 2021-Present

KatanaGraph Inc. — Austin, TX

- Worked on building a distributed graph compute engine that provides AI, analytics, and a database.
- Lead a team of **5** to implement and support graph database querying and ingest.
  - Guided design discussions, identified organizational blockers, and coordinated with product to set priorities and generate new technical requirements.
- Implemented compiler and runtime support for the **Cypher** query language.
- Designed and implemented novel high performance algorithms for distributed subgraph pattern matching (tested on ∼**20B** nodes, **44B** edges)
  - Improved performance by **100x** in queries against the **LDBC-SNB** datasets and reduced memory usage by over **95%** on benchmarks simulating specific client workloads.
- Proposed and implemented AST transformations to optimize query performance
- Designed syntax extensions to **Cypher** to allow users to tune query performance
- Built a hotswap mechanism to allow devs to replace only salient parts of a katana deployment on **kubernetes**, reducing org-wide feedback cycles by up to **30x**
- Built infrastructure for benchmarking the query engine in isolation from the rest of the product using **slurm**

Member of Technical Staff Aug 2019-Feb 2021

Qumulo Inc. — Seattle, WA

- Worked on building a distributed scale-out filesystem, supporting both on-prem and cloud.
- Designed a solution for reducing server downtime during upgrades by **10X** in a team of four
- Extended platform support for two new hardware configurations
- Implemented the following **SMB** features: SMB 3.1.1 negotiation, Server-side copy, Encryption
- Lead migration of **python2** code to **python3**, and introduced enforced type checking via **mypy**
- Proposed and implemented a python dependency verification tool for customer and cloud deployments

Systems Programming Course Lead Jan 2017-May 2019

CS241 @ UIUC — Urbana, IL

- Lead assignment developmer, Lab assistant, Honors section lecturer/mentor.

PROJECTS

rainbow python/Cypher

https://github.com/aneeshdurg/rainbow

- Arbitrary compile-time function coloring and callgraph rejection tool powered by **clang** and **Cypher**
- Provides an ergonomic way for users to labels functions and lambdas, and then define relationships between those labels that should be considered invalid. Some example usecases are:
  - label functions that assume locks are held to verify that they are never called without a lock
  - label routines using collective MPI operations to ensure that other collective operations aren't called during execution
  - prototype new language features such as async/constexpr without writing custom compiler passes/extensions

What Is a Filesystem? Javascript

https://aneeshdurg.me/what_is_a_filesystem

- An online interactive book/vizualization for students learning filesystem concepts.
- Implements a interactive ext2-esque filesystem simulator with animations to illustrate disk accesses.
  - Features a terminal simulator demonstrating how standard `GNU/Linux coreutils` might interact with the disk.

CameraTheremin JavaScript

https://aneeshdurg.me/CameraTheremin

- In-browser webcam gesture-based theremin (a musical instrument) powered by **Javascript** + **WebGL**

EDUCATION

University of Illinois at Urbana-Champaign Aug 2015-May 2019

Recieved BS in **Computer Science & Mathematics** with **High Distinction**