Swapnil Patel

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Experience

Intel Corporation Santa Clara, CA
Software Engineer *Apr 2020 - Present*

- **SPEC Cloud**: Driving the development of an industry-standard distributed systems benchmark for data centers on SPEC.org, collaborating with a diverse team of Intel, cloud industry professionals, and academic partners.
  - **Test harness Development**: Led development of test harness(python3)- client and workload deployment modules using Docker, report generation using templates and setup tests with >80% code-coverage.
  - **Benchmark Implementation and Optimization**: Drafted proposals and integrated open-source component benchmarks and scoring algorithms for Redis, nginx, gRPC Go server, BERT, and DLRM, tailored for real-world use cases. Deployed these benchmarks across a variety of the latest server platforms, ensuring extensive performance analysis and system compatibility using profilers, Linux-perf and Flamegraphs.
  - **Performance Analysis and Characterization Studies**: Performed detailed micro-architecture level characterization studies for the implemented benchmarks, providing critical insights into system performance under various workloads, influencing future SoC design and optimization strategies.
- **SystemBenchmark**: Characterized and optimized end-to-end micro-service mesh performance on a multi-node bare-metal cluster using DeathStarBench applications (social network, hotel-reservation)
  - **Micro-service config optimization**: Refactored and optimized studies for micro-service mesh scaling and scheduling, leveraging Bayesian search to identify Pareto optimal configurations for maximum RPS and resource efficiency. Reduced study runtime by 5x, enabling faster optimization cycles.
  - **Characterization and benchmarks**: Leveraged the benchmarking data, alongside hardware and software metrics, to articulate the exhaustive generational improvements of the latest SoC platforms. Analysis and metrics were used on marketing materials, directly correlating to millions of units sold.
- **Silicon Health Check**: Designed, developed, debugged, and tested system software, crucial for pinpointing and resolving silicon defects in data centers.
  - **CI and Test Setup**: Collaborated with a team of 5 to expand and create customer-facing tools that offer deep visibility into system health and facilitate flagging silicon issues in production environments.
  - **Defect detection and Report**: Refactored CI pipelines, added tests for final report parsing and comparisons, resulting in faster bug detection and version compatibility, accelerating software adoption and improving overall efficiency.

Intel Corporation Folsom, CA
Graduate Technical Intern *Jan. 2019-Dec. 2019*

- **Function as a Service**: Conducted characterization of FaaS framework - OpenFaaS, to study cold-start and warm-start times for containers and micro-vms in serverless environment. Authored an in-depth internal white-paper, detailing the findings and providing insights into performance optimizations and best practices.
- **Containers Catalog Dashboard**: Created containers and developed catalog dashboard for internal and external Intel tools, showcasing the value of emerging data-center memory and storage products.

Projects

* **Opstimus [Personal]**: Cluster telemetry collector with GPT enabled retrieval and analysis capabilities.
* **Newt**: FaaS framework with CLI and web IDE enables one place development and resource management.
* **Cubii Elliptical app backend**: Developed backend apis on Django for elliptical trainer Android and IOS app. Decreased server b/w utilization, sync latency to 6x.

Programming Skills

Proficiency: Python, Go, Git, Unix, SQL.
Familiar Tools: Java, C++, React, nginx, gRPC, Redis, Kafka, RabbitMQ, Elasticsearch, PyTorch.

Education

California State University - Sacramento Sacramento, CA
Master of Science in Computer Science; GPA: 3.53 *Aug. 2017 – Dec. 2019*
Dharmsinh Desai University Nadiad, India
Bachelor of Technology in Computer Engineering; GPA: 3.7 *July 2012 – May 2016*