

# IRFAN SHARIF

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## SUMMARY

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- Experienced with Go, Haskell, C, C++, Ruby, Python with working knowledge of Rust
- Exposure to performance profiling with pprof, perf, kcache/grind/callgrind and flame graphs

## EXPERIENCE

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### Cockroach Labs, Inc.

New York, NY

Storage/Performance

May – Sept '17

- Designed a flow-control mechanism for write operations to reduce 99-th percentile latencies
- Authored and implemented an RFC introducing a dedicated storage engine specialized for Raft's access patterns/persistent state, increased system write throughput by 14.6%
- Fixed **etcd/raft**'s PreVote implementation from the Raft thesis paper, model checked with TLA+
- Re-wrote core **grpc/grpc-go**, an RPC subsystem, batching syscalls and reducing GC pressure

Distributed SQL

Aug – Dec '16

- Constructed the distributed and parallel query processing engine based off the DistSQL RFC
- Implemented distributed sort algorithms and parallel aggregations for analytics workloads
- Designed distributed row de-duplication and highly performant  $n$ -way parallel SQL joins
- Improved existing SQL join performance by an order of magnitude using in-memory hash tables

### Shopify

Ottawa, ON

Production Engineering

Jan – Apr '16

- Designed a dynamic and flexible continuous integration system with auto-scaling build agents
- Built infrastructure to support dynamic workload distribution across shared worker pools
- Optimized the overall scheduling system to handle 1,000+ builds per day saving 60,000 USD/mo

### Solink

Kanata, ON

Cloud Migration

May – Sept '15

- Decomposed a single monolith platform into inter-connected and resilient microservices

## RESEARCH

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### uWaterloo Computer Aided Reasoning Lab

Waterloo, ON

Researcher

Oct – Dec '16

- Researched SAT solvers and search space pruning, studied clustering and parallelization strategies

## PROJECTS

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### Compiler

[git.io/v7cGZ](https://git.io/v7cGZ)

- Wrote a compiler in Haskell for a subset of VHDL, authored a transpiler to Java for simulation
- Added code generation, register allocation, common sub-expression and dead code elimination

### CFilter

[git.io/v6GkV](https://git.io/v6GkV)

- Implemented the Cuckoo Filter paper, a probabilistic data structure for set-membership queries
- Trended on the front page of HackerNews with 30,000+ views, 670+ stars and 30+ forks on GitHub

Open-source contributions: **coreos/etcd**, **grpc/grpc-go** **uber/go-torch**,

## EDUCATION

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### University of Waterloo

Sept '14 – Apr '19 (*expected*)

Honours Bachelor of Applied Science in Computer Engineering

GPA 3.7