

Adam Stuart Richardson

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Employment

Stripe - Engineering Intern on Storage

January - April 2017

- ❖ Built a custom MapReduce pipeline to calculate database storage density across primary key range with a novel dynamic programming algorithm, thereby enabling perfectly optimal shard splits
- ❖ Developed and tested a data pipeline in Scala to ascertain correctness between database replica sets, based on heuristic analysis of periodic disk snapshots
- ❖ Performed shard splits via a custom Ruby sharding layer across all merchant databases, tripling the database fleet, thereby avoiding disk exhaustion, improving efficiency and safety of routine maintenance tasks, and improving performance of API methods for end users
- ❖ Implemented quality-of-life tooling improvements to various MongoDB maintenance tasks as part of a larger database tooling framework, lowering replication lag by an order of magnitude

Shopify - Software Developer Intern on Infrastructure

January - August 2016

- ❖ Designed, implemented, and deployed a custom caching layer for NGINX software load balancers in Lua, mitigating malicious clients and processing tens of thousands of requests per second
- ❖ Built a custom software packaging system designed for mission-critical software, enabling the production and deployment of Ubuntu packages from a clean-room environment
- ❖ Refactored and developed large-scale distributed HTTP load testing software, capable of generating hundreds of thousands of requests per second, in Go
- ❖ Developed an open-source Heroku package to allow easy integration with Shopify's encrypted configuration management solution

Projects

- ❖ **ply** (C++, Scheme): a Scheme interpreter with closures, garbage collection, arbitrary-precision math
- ❖ **goword** (Go, WebSockets, Javascript, HTML5): a multiplayer in-browser word search game
- ❖ **kigo** (Go, PostgreSQL): a work queue implementation, inspired by the Sidekiq library for Ruby, designed with a sane object model and durable job queueing for high resiliency and observability
- ❖ **raycast** (Javascript, 3D rendering): proof-of-concept raycaster 3D engine, rendering a first-person view of a 3D maze world, randomly generated via Prim's algorithm and solved via simple DFS
- ❖ **kudos** (HTML5, Javascript): in-browser sudoku engine, with automatic solving and preloaded games

Education

- ❖ Candidate for Bachelor of Computer Science, University of Waterloo, Waterloo, Ontario, Canada; graduation projected for 2019

Accolades

- ❖ Twice a top-24 competitor in the Canadian Computing Olympiad, Canada's premiere high school programming competition
- ❖ Two-time provincial champion in track and field; recipient of University of Waterloo MVP award in varsity cross-country running