

# Arham Ahmed

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## Education

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### University of Waterloo

Sep. 2014 - Apr. 2019

CANDIDATE FOR BACHELORS OF APPLIED SCIENCE IN HONOURS COMPUTER ENGINEERING, CO-OP

GPA: 3.6

## Skills

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- Experience in Java, C#, Ruby and JavaScript; familiar with Go, C, C++, Python, BASH
- Git, React, Ruby on Rails, Spark, Hadoop, ZooKeeper, AWS EC2, Android, Flask, UNIX, Vim

## Experience

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### Amazon (A9.com)

Sep. 2018 - Present

ADVERTISING TECHNOLOGY

Palo Alto, California

- Crafted a novel genetic algorithm based SAT solver in Java to solve an NP-hard problem of allocating ads to videos with multiple constraints in real time
- Modeled the ad allocation problem mathematically allowing the use of constraint solvers to find optimal solutions
- Built a stochastic greedy algorithm to allocate video ads resulting in a 8x speedup with near optimal performance
- Added a new ad playlist serializer ingested by video players allowing dynamic ad placement, tracking, and control

### Microsoft

Jan. 2018 - Apr. 2018

AZURE STREAMING ANALYTICS

Redmond, Washington

- Designed and implemented an optimal sharding strategy to partition arbitrary streamed input events
- Reduced number of sharded output files heavily by efficiently caching file handles while minimizing memory usage
- Increased write throughput to Blob Storage by 13 % by migrating all IO operations to asynchronous tasks
- Introduced feature flags, enhanced validation, and added telemetry improving service incident mitigation

### Google

May 2017 - Aug. 2017

GOOGLE CLOUD

Kirkland, Washington

- Drafted a design document for a private library hosting service running on App Engine and Container Engine with a multi-tier architecture saving 25% in operational costs
- Implemented the service with 99.95% uptime and tooling to manage its deployment to Google Cloud Platform (GCP)
- Reduced service CPU usage by 2.5x with asynchronous file backups triggered by whitelisted requests
- Added OAuth2, GCP compatible storage / database layer, and server orchestration for load balancing on top of an existing library leveraged for hosting functionality

### Shopify

Sep. 2016 - Dec. 2016

PRODUCTION ENGINEERING

Ottawa, Ontario

- Built a scalable, distributed, and robust mobile CI system in Ruby leveraging shared storage for optimal build speeds
- Automated and optimized virtual machine provisioning speed by 120% and sped up deployment by a factor of 7.6x
- Improved build times by 350% by building caching infrastructure leveraging a Shared Area Network and Redis
- Prevented concurrency problems susceptible to data corruption by designing efficient non-blocking alternatives

### Innovasium Digital

Jan. 2016 - Apr. 2016

WEB APPLICATIONS

Markham, Ontario

- Developed multi-purpose management platforms using React, adhering to Facebook's Flux application architecture
- Built RESTful APIs using Ruby on Rails with JSON Web Token based authentication and Amazon S3 support

## Projects

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### Kura

git.io/vpiyJ

- Devised an end-to-end encrypted, synchronized, distributed file system as undergraduate capstone project
- Formulated a secure file sharing protocol modeled after WhatsApp's proven Signal protocol

### Cerebrum

git.io/vwRxF

- Implemented a lightweight and easy-to-read artificial neural network library in Ruby with over 4,500 downloads
- Used supervised learning with a backpropagation algorithm to form a predictive model for arbitrary input sets