Guanming Qiao

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EDUCATION

COLUMBIA UNIVERSITY, *B.S. in Computer Science*   Class of 2019
UNIVERSITY OF BRITISH COLUMBIA, *M.S. in Computer Science*   Expected: 2025

TECHNOLOGIES AND SKILLS

- **Certificates**: AWS Certified Solutions Architect – Associate, Professional Scrum Master I (Scrum.org)
- **Languages/Tools:** Java, Python, Groovy, Unix Shell Script (Bash), Git
- **Cloud Frameworks:** AWS Services, BotoAPI, Docker, Kubernetes, StatsD Monitoring, Pulumi Infrastructure-as-Code
- **Tooling Frameworks:** Jenkins, Jenkins DSL, Spinnaker CI/CD tools, Spring Expression Language, Selenium Testing, LibAFL Testing

RELEVANT WORK EXPERIENCE

GrubHub   New York, NY
Software Engineer   *August 2019 - September 2020*
- Work on Infrastructure Platform Engineering team (DevOps)
- Contribute to improving GrubHub's **micro-services** architecture by building two sidecar services: **AWS Container Lifecycle Manager** and **Service Discovery Agent**
- Enhanced the visibility, maintainability and resilience of GrubHub's cloud resources by building a self-service **AWS infrastructure-as-code** deployment pattern, being noted in the news for helping GrubHub achieve infrastructure stability
- Collaborate closely with other teams to enhance GrubHub's **CI/CD** Tooling, leveraging **Jenkins** domain-specific language and **Spinnaker** modules written in Spring Expression Language

BlackRock   Seattle, WA
Software Engineering Intern   *June 2018 — August 2018*
- Developed a **Selenium** webdriver-embedded monitor that performs **automated integration tests** on REST APIs by capturing and verifying HTTP traffic against a **JSON-defined DSL**
- Worked across time-zone with internal stakeholders to enable the change, modifying two internal frameworks that drive 80% of API tests for Aladdin, BlackRock's core platform supporting about $15 trillion in asset

PROJECTS

Fuzzing Smart Contract Vulnerability   Vancouver, BC
University of British Columbia   *October 2023 – Present*
- Conduct program analysis and software testing research in University of British Columbia's Software System Lab (SPL), under supervision of Professor Caroline Lemieux
- Profiled ItyFuzz, the current state-of-the-art **fuzz testing** tool for **EVM**-based smart contracts, and identified sub-optimal input scheduling strategy that causes its inability to detect **application layer vulnerabilities** such as oracle manipulation
- Propose and evaluate possible optimizations by improving test mutation and sampling algorithms in **LibAFL**, a **Rust**-based fuzzing library

Pulumi AWS Infrastructure-as-Code   New York, NY
GrubHub   *April 2020 - September 2020*
- Implemented GrubHub's internal AWS resource management tool based on **Pulumi SDK**, a library of **infrastructure-as-code** (IoC) adapters, developing the project in **Python**
- Created **CI/CD** tooling for previewing, auditing, deployment and rollback of GrubHub's AWS resources managed by code
- Worked across teams to onboard 260+ pre-production and 220+ production **Classic Load Balancers, Application Load Balancers, and Network Balancers** under IoC management, with 0 production incident
- Enhanced GrubHub's infrastructure resilience during the onset of pandemic by ensuring **consistent deployment patterns** revoking unaudited AWS access privileges from developers, being **recognized in tech news** for the project

Service Discovery Agent   New York, NY
GrubHub   *January 2020 - May 2020*
- Built Service Discovery Agent in **Python**, a lightweight sidecar that manages micro-service instances' lifecycle in **Netflix Eureka** (a service-registry), enabling the team to retire legacy framework
- Leveraged **gRPC** and **RESTful API** to communicate with GrubHub's other internal services
- Implemented **Java Spring**-based service framework changes to retire previously monolithic service registration code
- Oversaw a **phased rollout** of the Discovery Agent to 32+ services in test, and 10 services in production

AWS Lifecycle EC2 Manager Service   New York, NY
GrubHub   *September 2019 - November 2019*
- Developed Eureka-Lifecycle, a **Python** application that handles graceful exit of terminating **EC2 instances**, by listening to life-cycle events posted to an **AWS SNS** topic, and gracefully de-registering the instances from Netflix Eureka, a service-registry
- Eureka-Lifecycle service enabled safer rollout of **AWS CloudWatch** metrics-based AWS autoscaling for 50+ services, saving major cloud provider costs for GrubHub

Software Similarity Detection   New York, NY
Columbia University   *August 2018 – September 2020*
- Implemented **test-augmentation algorithms** to automatically generate, execute, and record valid high-coverage tests cases
- Built subgraph similarity model between JVM by comparing I/O and **JVM bytecode** execution-trace-level similarity metrics
- Published technical report about the research on MICE, the Columbia University tech journal website