

# Kelson Qu

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## EDUCATION

**Northeastern University** | San Jose, CA

Sep 2023 – May 2026

*Master of Computer Science | GPA: 4.0*

- **Coursework:** Object-Oriented Design, Data Structures and Algorithms, Web Development, Database Management, Cloud Computing, Computer Networking

## WORK EXPERIENCE

**BMW Group** | Shanghai, China

July 2022 – May 2023

*Development Intern, R&D Department of New Technology | Python, SQL, React, Tech Scouting*

- Developed **Python**-based automated test framework for automotive E/E chip validation, build interactive GUIs for test execution and real-time data visualization, streamlining analyses and generating more than 100 technical insights.
- Collaborated with global teams to scout prototype solutions for 5G/6G and non-terrestrial networks, optimizing data throughput and connectivity in automotive software and E/E architectures through advanced network protocols.
- Refactored **SQL queries** of related companies' databases, enhancing data retrieval efficiency, cutting retrieval time by 33% and improving large-scale data processing performance by 40%.
- Conducted **Python data mining** and analysis on 500,000+ historical trajectory and city map data, improving analytical precision through optimized SQL queries and aggregation techniques.
- Co-maintained <http://www.bmwstartupgarage.com.cn> website by improving server configurations and add new UI using **React**, trimming page loads by 30%, resulting in an increase of 200+ monthly website visits and 50+ additional visits of startup per month.

**CDP Group** | Shanghai, China

July 2021 – Oct 2021

*Development Intern, Development Department | React, Taro, Jira, CI/CD, testing*

- Designed and developed interactive features for a Mini Program using **React**, increasing daily active users by 20% through personalized recommendations and real-time notifications.
- Built responsive **web applications** for Youth China, creating **20+ RESTful APIs** to ensure cross-device compatibility, improving overall user experience and receive awards from official organizations.
- Streamlined development processes by implementing **Agile workflows**, **Jira** management, **CI/CD pipelines**, and **security reviews**, reducing deployment times by 30% and minimizing post-release issues by 15%.

## PROJECTS

**Distributed RPC Framework Optimization** | Java, Netty, Zookeeper, Guava, FastJSON, Protobuf

- Developed a **distributed RPC framework** in **Java**, enabling local services to register, publish and perform remote calls across RPC nodes, and optimized the framework to handle various scenarios effectively.
- Designed a proprietary protocol to address packet fragmentation, implemented custom encoders/decoders with support for **Java native**, **FastJSON**, and **Protobuf** serialization, and utilized **Netty** for non-blocking I/O communication, optimizing connection efficiency.
- Integrated **Zookeeper** for dynamic service registration and configuration, implementing client-side caching and dynamic load balancing: round-robin, random access, LRU, and consistent hashing.

**SaaS Short Link Platform** | Java, SpringBoot, SpringCloud, Redis, MySQL, RocketMQ, Apache ShardingSphere, Azure-Sentinel

- Developed a high-performance short link management platform utilizing **SpringBoot**, **SpringCloud**, **Redis**, and **MySQL** for efficient link creation and traffic redirection.
- Implemented message queuing with **RocketMQ** and optimized data handling through cache invalidation strategies, ensuring consistent performance under peak traffic.
- Utilized **Sentinel** for traffic control and rate limiting, ensuring system stability during high concurrency scenarios, which achieves 12k TPS for link creation and 56k QPS for link redirection, even under sudden traffic surges.

**Canvas-like Course Management System** | TypeScript, Node.js, MongoDB, React, Bootstrap, Axios

- Developed a full-featured course management system using **React**, **TypeScript**, and **Node.js**, supporting core teaching functions such as courses, assignments, and quizzes.
- Implemented JWT-based user authentication with role-based access control (student/teacher/teaching assistant) and managed global state using **Redux** Toolkit for seamless integration of course content, submissions, and grading.
- Designed responsive UI with **Bootstrap**, real-time editing features, and **Axios** for API requests, achieving a modular codebase with 85% component coverage and ensuring system scalability and maintainability.

**Career Fair Registration System** | Python, Django, React, TypeScript, MySQL, Google Cloud

- Designed and developed a maintainable career fair registration platform using **Django**, **React** and **MySQL**, support 10,000+ concurrent users in different roles.
- Developed secure **RESTful APIs** using Django REST Framework, implementing **JWT** for user authentication and **OAuth** for third-party login integration, ensuring robust security for 30+ features.
- Optimized platform scalability and cost-efficiency by leveraging **Google Cloud Platform's** serverless architecture, utilizing **Cloud Functions** and **API Gateway** to auto-scale resources based on traffic demand.

## SKILLS

- **Languages:** Java, Python, Go, C/C++, C#, SQL, JavaScript, TypeScript, HTML, CSS, Swift, Bash, Scala
- **Frameworks:** Maven, Spring, SpringBoot, Django, Flask, Node.js, Express.js, Next.js, React, Angular, Bootstrap
- **Databases & Cloud:** MySQL, Oracle, PostgreSQL, MongoDB, Redis, Amazon Web Service (AWS), Google Cloud Platform (GCP)
- **Infrastructure & CI/CD:** Linux, Nginx, Docker, Kubernetes, Zookeeper, Git, Jenkins, Jira
- **Messaging & Data Processing:** Kafka, RocketMQ, gRPC, MyBatis, Elasticsearch, GraphQL