Avril Liu . Jarvis Consulting

I am a Backend Engineer with 2+ years of experience building cloud-based backend services and distributed systems. I work primarily with Java and Spring Boot to design and develop RESTful APIs, microservices, and event-driven service platforms using Kafka, Redis, and SQL/NoSQL databases. I have contributed to high-throughput, multi-tenant messaging and cloud service systems, with a focus on reliability, scalability, and operational stability. I hold a Master's degree in Computational Science and am motivated to build reliable, production-grade systems in enterprise environments.

Skills

Proficient: Java, Spring Boot, RDBMS (MySQL, PostgreSQL), MongoDB (NoSQL), Kafka, Redis, Docker, Kubernetes, Linux (Bash, CLI, Shell Scripting)

Competent: Python (Flask / FastAPI), TypeScript/JavaScript (React / Next.js), RESTful APIs, SQL & Data Modeling, Cloud Platforms (AWS / GCP), CI/CD (GitHub Actions / Jenkins), Netty, gRPC

Familiar: Message Queuing (RabbitMQ / SQS), Observability & Monitoring (Prometheus, CloudWatch), Distributed Systems Concepts (Raft Consensus Algorithm), API Documentation, Responsive UI Implementation

Jarvis Projects

Project source code: https://github.com/jarviscanada/jarvis_data_eng_AvrilLiu

Linux Cluster Monitoring Agent [GitHub]: Developed a Linux cluster monitoring system on Rocky Linux to collect hardware and resource usage metrics using Bash scripts. Automated data ingestion into a Dockerized PostgreSQL database with crontab scheduling, enabling centralized monitoring and reducing manual operational overhead.

SQL [GitHub]: Built and exercised a PostgreSQL environment using Docker to practice relational database design and querying. Defined schemas with DDL scripts, populated datasets for testing, and wrote SQL queries involving multi-table joins, aggregations, subqueries, and data transformations to analyze structured data and validate query logic.

Core Java Apps [GitHub]:

- JDBC Stock App: Built a Java-based CLI application for managing stock portfolios, supporting quote lookup, buy, sell, and performance tracking. Integrated a real-time stock data REST API and persisted data to PostgreSQL via JDBC. Implemented structured logging with SLF4J, containerized the application using Docker, and managed dependencies with Maven. Validated core functionality through unit and integration tests using JUnit and Mockito.
- Grep App: Developed a Java application that replicates core functionality of the Linux grep command using object-oriented design. Implemented recursive file traversal and regex-based pattern matching, leveraging Java Streams and Lambda expressions for efficient data processing. Added logging with Logback and packaged the application into a Docker image using Maven for dependency management.

Spring Boot Trading App [GitHub]: Developed a Spring Boot–based trading application that exposes RESTful APIs for stock quote retrieval, order execution, and portfolio management, with an emphasis on clear service boundaries and backend correctness. The application integrates an external market data API for real-time pricing, applies a layered architecture (controller, service, DAO) to separate business logic from persistence concerns, and enforces validation and error handling to maintain data integrity. Relational data models were designed and implemented with JDBC and PostgreSQL, complemented by structured logging, containerized deployment using Docker, and unit and integration tests to verify end-to-end trading workflows.

Highlighted Projects

Roots & Route (Volunteer Engineering Project, Canada): Developed an AI-assisted trip planning platform as a volunteer engineering project, collaborating with team members based in Alberta while working from Toronto. Designed backend services to automate itinerary generation and multi-tenant route management, integrating AI-driven workflows for dynamic travel planning. Implemented data persistence and authentication using Supabase, with a focus on maintainable service design, reusable business logic, and reliable data flows to support real-world usage scenarios.

Custom Java RPC Framework (Netty): Designed and implemented a lightweight Java RPC framework to explore service-to-service communication patterns and performance trade-offs in distributed systems. Built on Netty with dynamic proxy–based invocation, pluggable serialization (Kryo and Protobuf), and connection-level heartbeat handling to detect

failures. Focused on low-latency request handling, connection management, and basic fault tolerance to support reliable communication between backend services.

Raft Consensus Algorithm: Implemented core components of the Raft consensus algorithm, including leader election, log replication, and failure recovery, to study consistency and fault-tolerance behavior in distributed systems. Focused on state transitions, term management, and correctness under node failures and network partitions, gaining practical understanding of how consensus protocols maintain replicated state across unreliable nodes.

Operational Data Classification with Machine Learning: Designed and implemented a supervised classification project to analyze operational system data, focusing on data preprocessing, feature extraction, and model evaluation. Trained and compared standard classifiers and evaluated results using precision and recall to understand model behavior and generalization characteristics. The project emphasized methodological correctness and practical application of machine learning techniques in system monitoring and observability scenarios.

Autonomous Mobile Robot Navigation: Participated in a hands-on robotics project using real mobile robot hardware to perform environment-aware navigation. Contributed to implementing vision-based logic for recognizing directional markers in the environment and mapping them to turning and movement decisions. The project emphasized practical system behavior under physical constraints, including sensor noise, execution delays, and non-ideal operating conditions.

Professional Experiences

Data Engineer & Java Developer, Jarvis (2025 – Present): Developed backend and data-related development tasks within an Agile/Scrum team, touching Java/Spring Boot services, SQL-based data handling, and Linux environments. Built REST APIs, wrote database queries and schema changes, and ran applications in Dockerized setups as part of iterative development cycles. Worked with sprint-based workflows, regular check-ins, and code reviews to support steady progress and maintain code clarity and quality.

Software Developer, Qiniu Information Technology (Jun. 2022 – Apr. 2024): Built and maintained a high-throughput cloud messaging platform supporting OTP, alerting, and bulk notification workflows. Contributed to the design and optimization of an event-driven pipeline using Kafka and Redis to handle peak traffic exceeding 15K+ QPS, achieving double-digit throughput improvements and reducing end-to-end latency by approximately 20–30%. Extended the platform to integrate with 12+ external SMS gateways, implementing automated failover, SLA monitoring, and observability using Prometheus and ELK to ensure reliability and operational stability.

Backend Developer Intern, Alibaba Cloud (Jun. 2021 – Apr. 2022): Contributed to cloud host lifecycle management and approval workflows, supporting secure service integration using gRPC and Dubbo. Participated in optimizing MySQL indexes for large-scale datasets and contributing to Kafka-based data migration pipelines handling 10M+ records with data consistency guarantees. Supported containerized service deployments using Docker and Kubernetes, gaining hands-on experience with scalable and fault-tolerant infrastructure in a production environment.

Education

Laurentian University (Sep 2024 – Aug 2025), Master of Computational Science (2-year program, early completion), Computational Science - N/A

Heilongjiang University (Sept 2018 – Jun 2022), Bachelor of Computer Science, Internet of Things - Recognized for participation in a university innovation and entrepreneurship program. - First Prize in Freshman Algorithm Competition - Second Prize in University-Level Algorithm Competition

Miscellaneous

- Participated in organizing and coordinating a Procter & Gamble campus charity sale, supporting a large-scale student event involving over 3,000 participants.
- Participated in outdoor volunteer activities supporting trail maintenance and environmental conservation, contributing to community spaces through hands-on work.