KAI HE

Honours Computer Science, Business Option
University of Waterloo
Personal Project Demos: https://github.com/k2he

SUMMARY OF QUALIFICATIONS

- *15+ Years of Full-Stack Expertise:* Specialist in architecting high-concurrency, large-scale enterprise systems, with deep expertise in event-driven microservices and high-throughput Kafka streaming applications.
- *End-to-End Solutioning & Strategy:* Expert in translating complex business requirements into robust technical blueprints; proficient in system estimation, cross-stack implementation (UI, Backend, Database), and advanced production troubleshooting for distributed environments.
- *Stakeholder Leadership:* Distinguished communication skills developed through leading technical alignment meetings and delivering high-impact executive demos for clients, Product Owners, and cross-functional engineering teams.
- *AI-Driven Innovation:* Committed to the bleeding edge of the industry; integrating Generative AI into enterprise workflows using LLMs, Context/Prompt Engineering, and the modern Python AI ecosystem.
- *Technologies utilized:* Java 25, Microservices architecture, Spring Boot 4, Spring Cloud Stream, Kafka, Python AI Stack (LangChain, Google Gemini, Vertex AI, Whisper), FastAPI, uv, Pydantic, Black, isort, Context/Prompt Engineering, LLMs, JWT, Spring Security, SSO, Avro, Spring Batch, Spring Data, Redis, MongoDB, and TDD methodologies.

COMPUTER PROFICIENCY

- *Backend:* Java 25, Spring Boot 4, RESTful APIs, Apache Kafka, Kafka Streams, Spring Cloud Stream, Spring Security, Spring LDAP, Spring AOP, Spring Batch, SOAP, JPA/Hibernate, MQ, Elasticsearch, Splunk, Logstash, JWT, Log4j2, Lombok, OpenAPI/Swagger, Kpow, Postman Enterprise.
- *Gen AI*: Python, Google Gemini, Vertex AI, Whisper, uv, Pydantic, Black, isort, Context/Prompt Engineering, LLM Integration, RAG, Spring AI.
- *Frontend*: Angular 14, Angular Material, Typescript, RxJS 6, NgRx (Redux), JavaScript, jQuery, CSS3/SCSS, XML, HTML5, JSON, AODA, GWT/GWTP, Nginx.
- *Database*: MongoDB, PostgreSQL, MySQL, MS SQL Server, Oracle, Sybase, Stored Procedures, Advanced SQL Tuning.
- *Cloud*: Spring Cloud, Docker, Kubernetes, Azure, AWS (IAM, CMK, KMS, S3, EC2, RDS), GCP.
- *Cloud*: Docker, Kubernetes (K8s), Azure, AWS (IAM, CMK, KMS, S3, EC2, RDS), Google Cloud (GCP).
- *Tools & Others:* IntelliJ, PyCharm, VS Code, Maven, Gradle, Jenkins, SonarQube, Sonatype, Git, Bitbucket, Dockerhub, WebLogic, JIRA, JAWS/NVDA/VoiceOver, WAVE.

WORK EXPERIENCE

Senior Solution Designer   Mar 2023 – Dec 2025
TD, Toronto ON

- Architected a multimillion-dollar, event-driven Anti-Money Laundering (AML) application on Azure, utilizing Kafka Spring Cloud Stream to monitor international transactions across Personal Banking, Business Banking, Wealth, and Securities.
- Engineered a scalable Generative AI solution to streamline support operations, converting raw call audio into concise summaries via Whisper and Google Gemini. Significantly improved agent productivity and issue-resolution speed by providing instant visibility into call context and required actions.
- Architected a multi-stage AI orchestration framework using advanced Context Engineering to transform raw business requirements into high-precision and context-rich prompts for automated, end-to-end project generation. Established a "Requirement-to-Code" pipeline to accelerate development and ensure architectural consistency, successfully demoing the solution to a 170-member engineering organization.

- Collaborated with cross-functional stakeholders to bridge the gap between business requirements and technical constraints, recommending scalable and adaptable solutions that ensure strict compliance with financial security standards.
- Established engineering excellence and governance by defining coding standards, project structures, testing guidelines, and code branching strategies; led code reviews for a team of 12 developers as one of two primary gatekeepers and provided hands-on guidance and sample code for migrations to Spring Boot 3 and Java 21.
- Directed the full design lifecycle for global e-transfer AML monitoring, producing 100–200 page High-Level and Low-Level Design (HLD/LLD) specifications, including complex process flows, retry mechanisms, and deployment configurations to ensure seamless BAU transitions.
- Drove technical innovation and security by conducting POCs for new technologies, implementing custom encryption solutions for external vendor data transfers (Fintrac), and optimizing infrastructure observability via Kafka state store and topology monitoring.
- *Technologies used*: Kafka, Spring boot 3, Spring Cloud Stream, Spring batch, Java 21, MongoDB, Azure, Kubernetes, Python, Gemini, Vertex AI, LLM, LangChain, FastAPI, Pydantic, Pytest, uv, Black, isort, Whisper, Context Engineering, Telemetry, Redis, Postman, Lombok, Splunk, Kpow, Junit 5, Jenkins, SonarQube, SonarLint, Microsoft Visio, Veracode.

Senior Software Engineer (Full stack)   Sept 2022 – Feb 2023
Home Depot, Toronto ON

- Architected and engineered a high-scale, cloud-native online payment and billing system utilizing an event-driven microservices architecture powered by Spring Cloud Stream, Kafka, and Docker to handle complex financial transactions.
- Defined the foundational project architecture and developed shared enterprise libraries for error handling, validation, and logging, while establishing the coding standards and development environments utilized by the development team.
- *Technologies used*: Microservices, Kafka, Spring Cloud Stream, Spring boot 2, REST, Java 11, Hibernate, Docker, Swagger, Postman, Lombok, Elasticsearch, PostgreSQL, Junit 5, GCP, Jenkins, Fortify, SonarQube, Kubernetes (GKE).

Senior Software Engineer (Full stack)   Sept 2020 – Sept 2022
BMO, Toronto ON

- Modernized legacy processing by introducing Spring Batch and Java Concurrency, successfully reducing system execution time by 50% while implementing robust automated logging.
- Architected a multimillion-dollar Personal Online Banking Advisor project using a cloud-native approach on AWS, featuring secure S3 encrypted uploads, banking-compliant data masking, and i18n support.
- Standardized engineering practices by introducing Google Code Style and leading technical hiring, onboarding, and code reviews to ensure high-quality delivery.
- *Technologies used*: Microservices, Spring boot 2, Java 11, REST, Hibernate, Docker, Kubernetes, Swagger, Postman, Lombok, Elasticsearch, MongoDB, Junit 5, Angular 14, Typescript, NgRx, AWS (IAM, KMS, CMK, S3).

Senior Software Engineer (Full stack)   June 2019 – Sept 2020
TD, Toronto ON

- Architected a next-generation credit card approval system using an event-driven microservices stack (Kafka, Spring Cloud Stream, Spring Batch), reducing runtime from 45 to 10 minutes and eliminating system downtime.
- Championed and executed critical stack migrations, including Java 8 to 11, Angular 7 to 9, and JUnit 4 to 5, while introducing NgRx to significantly enhance UI performance.

- Defined foundational project architecture and core libraries for error handling, i18n, and logging, establishing the base code structure and JUnit testing standards for all microservices.
- *Technologies used*: Microservices, Spring boot 2, Java 11, Azure, REST, Swagger, Postman, Lombok, SCSS, Kafka, MQ, Splunk, Oracle, Openshift, MongoDB, Angular 9, Typescript, NgRx.

Senior Software/Data Engineer (Full stack)   May 2018 – May 2019

RBC Capital Market, Toronto ON

- Led the full design lifecycle for multiple applications, acting as the primary technical lead for requirement gathering, technology recommendations, and client demonstrations.
- Engineered real-time data pipelines for capital market instruments (Bonds, Loans, CDS) using Kafka, Java, and Shell scripts to stream critical trading data to a Data Lake for regulatory compliance.
- *Technologies used*: Angular 7, Typescript, Angular Material, RxJS 6, NgRx, Java 8, REST API, Spring Boot 2, LDAP, Spring Security, Spring AOP, Oauth2, JWT, Log4J2, Swagger 2, Lombok, Querydsl, SCSS/CSS3, Docker, Kafka, Elasticsearch, AWS.

Prior Professional Experience Software Developer (Full stack)   Jan 2011 – Dec. 2017

Kanetix Inc | Telus Health | Teranet Inc

- *Technologies used*: Java 8, J2EE, GWT, GWTP, AODA, Angular 2, Angular Material, RxJS, REST API, JWT, Git, Maven, Jenkins, CSS3, XML, Spring boot, Sybase, Liquibase, Swagger.

EDUCATION

Bachelor of Computer Science (Co-op), Business Option   Apr. 2010

University of Waterloo, Waterloo, ON

PERSONAL INFO

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