Michael Karb

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Professional Summary

Software Engineer with a Master's in CS from the University of Illinois Urbana-Champaign and a proven track record of leading high-impact initiatives at IBM. Experienced in developing high-throughput microservices, building distributed data pipelines, architecting event-driven backend systems, and optimizing system performance.

Professional Experience

Software Engineer (Band 7), IBM – Research Triangle Park, NC
June 2022 – Present

- Designed and led implementation of a reusable **event-driven architecture** supporting **$30B in potential revenue** from **enterprise-grade services.** This architecture includes a network of **cloud-native Java microservices** using **Docker** and **Kubernetes**, with event orchestration via **Apache Kafka**.
- Architected a **dead letter queue** (DLQ) management system using **Spring Boot** and **Kafka**, integrated with **DB2 SQL** and **AWS S3 object storage** for end-to-end, auditable event tracking. Implemented automated requeue logic, exception analysis, and diagnostic reporting – enabled by this system – improving **fault-tolerance** of the event-driven architecture **by 99%**.
- Engineered a **patent-pending system** of configurable **Java microservices** for a **mission-critical, IBM-wide strategic integration platform** to unify distributed data across **60+ teams**, processing **$1M+ in transactional data daily**. Facilitates real-time routing between **DB2**, **S3**, and **MongoDB –** allowing for on-the-fly runtime behavior adjustments without redeploys – while handling **10K calls per minute**.
- Reduced **REST API** response times from **seconds to milliseconds** by leveraging **Java concurrency** and thread-safe design patterns.
- Collaborated on multiple IBM inner-source projects, including a shared CI/CD pipeline **adopted by 1000+ engineers** across the CIO domain, reducing deployment time **by 50%** through **Bash** scripting and **Tekton** automation on **Linux-based systems**.
- Orchestrated a **zero downtime 500TB legacy file migration** to modern **S3** instances, boosting transfer speed from **50MB/s to 800MB/s** by using reusable **Jenkins** jobs.
- Optimized complex **SQL** queries in **PostgreSQL** and **DB2**, joining **multi-trillion-row datasets** in sub-seconds by combining **Redis caching** with indexing strategies.
- **Took ownership of black box legacy services**, reverse engineering their functionality with minimal guidance while **creating comprehensive documentation** and becoming the primary point of contact for **resolving production issues**.
- **Mentored junior engineers** on Spring Boot web development, Kafka event patterns, cloud-native architectures, Java concurrency, and CI/CD best practices.

Software Engineer (Band 6), IBM – Research Triangle Park, NC
August 2021 – June 2022

- Led an agile team to develop a **high-performance publish/subscribe system**. Built robust microservices on **RedHat OpenShift** and **Linux-based environments**, leveraging **Kafka Connect** and **ksqlDB** to support **60+ teams**.
- Created unit testing with **JUnit** and build, smoke, and performance testing in **JMeter,** achieving **100% code coverage** and ensuring reliability.
- Created reusable **Kafka** consumer, producer, and admin applications in **Java**, streamlining development for other teams.

Education

University of Illinois Urbana-Champaign – Urbana-Champaign, IL
Master of Computer Science, GPA: 3.91 (Dec 2024)

University of Minnesota Twin Cities – Minneapolis, MN
Bachelor of Computer Engineering, GPA: 3.72 (May 2021)

Skills

Languages: Java | Python | SQL | C++ | C | JavaScript | HTML5 | CSS | Bash | R | Haskell

Frameworks: Spring Boot | Kafka | REST APIs | JUnit | React | Tailwind CSS | React Native | Three.js | WebGL | PyTorch | Pandas

Cloud/DevOps: Docker | Kubernetes | Jenkins | Git | AWS | Linux | Dynatrace | OpenShift | Tekton

Databases/Storage: DB2 | MongoDB | PostgreSQL | Redis | S3

Tools: JMeter | Maven | Gradle | Jira | Godot

Projects

- Personal Portfolio Website **using React**, **Tailwind CSS**, **and Three.js** (2025)
- Emotional Intelligence Mobile App **using JavaScript and React Native** (2024–25)
- UDP Link-state Router **in C++** – Graduate school project (2024)
- AI Daily Task Summarizer **with Jira integration** – Hackathon project (2023)
- 3D Ray Tracer with BVH **in C++** – Graduate school project (2023)
- Interpreter for Scheme (Lisp-dialect) using functional programming in **Haskell** (2023)
- Image-to-ASCII PDF Generator **using Python** (2022)
- Language Translator Bot in Discord **using Python** (2022)
- Road Damage Classification and Detection App **using PyTorch** (2021)

Leadership & Awards

- **Outstanding Technical Achievement Award** (OTAA) Nomination (2025)
- **Patent Pending**: Intelligent Workflow Extraction and Characterization (2025)
- **Vice President** – IBM Next (2024)
- **Team Lead** – Watson Challenge Hackathon (2023)
- **Speaker** – Carolinas Tech Exchange Conference (2023), IBM Site Showcase (2022)