# Prabhpahul Singh

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## Summary

Software Engineer with 6+ years of experience building scalable backend and full-stack applications across healthcare, insurance, travel, and payments using Java, Spring Boot, Python, React.js, JavaScript, Kafka, and cloud platforms. Strong in microservices, distributed systems, REST APIs, event-driven architecture, cloud-native development, and production AI solutions using Generative AI, LLMs, RAG, and Agentic AI. Experienced in improving system reliability, performance, automation, and data workflows while delivering secure and maintainable software. Brings a practical, collaborative approach to solving complex engineering problems and building reliable products that create measurable business value.

## Skills

- **Programming Languages:** Java, Python, C++, Kotlin, JavaScript, TypeScript, SQL
- **AI/ML & Generative AI:** Machine Learning, Generative AI, Large Language Models (LLMs), RAG, Agentic AI, OpenAI APIs, LangGraph, Vector Embeddings, Semantic Search, PyTorch, TensorFlow, Scikit-learn, Predictive Analytics, MLOps, AI Assisted coding
- **Backend & Distributed Systems:** Spring Boot, FastAPI, Microservices, REST APIs, Distributed Systems, Event-Driven Architecture, Asynchronous Processing, Hibernate, Spring Data JPA
- **Frontend Development:** React.js, Angular, HTML5, CSS3, Responsive UI Development
- **Cloud & DevOps:** AWS, Amazon S3, AWS Lambda, Amazon EC2, Amazon EKS, AWS Bedrock, GCP, Docker, Kubernetes, Jenkins, CI/CD, Cloud-Native Development
- **Data, Messaging & Storage:** Apache Kafka, Data Pipelines, ETL, Stream Processing, MySQL, PostgreSQL, Amazon Aurora, Redis, Data Modeling, Database Design, Query Optimization
- **Software Engineering & System Design:** Object-Oriented Programming, Data Structures, Algorithms, System Design, Software Architecture, Scalability, High Availability, Fault Tolerance, Performance Optimization, Multithreading, Concurrency
- **Testing, Security & Observability:** JUnit, Mockito, Unit Testing, Integration Testing, TDD, Authentication, Authorization, OAuth 2.0, JWT, Secure Coding, Prometheus, Grafana, OpenTelemetry, Logging, Monitoring, MTTR
- **Development & Delivery:** Git, Maven, Agile, Scrum, Code Reviews, Technical Documentation, Production Troubleshooting

## Experience

**Software Engineer, Eli Lilly, USA** **Mar 2025 – Current**

- Built a centralized serverless ingestion platform using AWS S3, AWS Lambda, Kafka, and Python to replace fragmented vendor onboarding workflows, reducing onboarding time by 80% while processing 20M+ insurance records per day for enterprise data teams.
- Developed RefundGuard as an automated audit service using Python, FastAPI, SQL, and distributed processing to analyze 500K+ insurance records, identifying overcharges and enabling $2M in customer refunds for financial and operations stakeholders.
- Built AskX as a distributed multi-agent platform using Python, FastAPI, RAG, SQL agents, classifier routing, and a fallback orchestrator to support clinical-trial queries, handling 200K queries per day and reducing estimated drug-dispensing resolution costs by 73% over 6 months for clinical operations.
- Modernized backend services with Java, Kotlin, Spring Boot, Hibernate, REST APIs, and microservices architecture to improve service separation and maintainability across insurance workflows for internal applications and business teams.
- Developed agentic AI workflows using OpenAI APIs, LangGraph, and Python/FastAPI to route requests across specialized retrieval and reasoning components, incorporating fallback handling for enterprise knowledge workflows.
- Integrated OpenAI APIs into enterprise AI workflows using Python, FastAPI, RAG, vector embeddings, and semantic search to generate context-aware responses across internal healthcare and research knowledge sources.
- Executed a zero-downtime migration of the configuration database from Aurora MySQL v2 to v3 using blue-green deployment to modernize the data layer, completing cutover in under 10 seconds with zero data loss for dependent services.
- Enhanced customer-facing workflows with React, JavaScript, SQL, and API integrations to provide accessible operational and insurance information through responsive applications, improving usability for business and clinical teams.
- Applied Generative AI and LLM-based retrieval patterns with RAG, prompt engineering, and cloud services to support context-aware enterprise assistants while improving observability, reliability, and governance of AI-enabled workflows.

**Software Engineer, Blue Cross Blue Shield** **Sep 2021 – Mar 2025**

- Architected scalable backend services using Java and Spring Boot to support cloud-native healthcare application workflows, improving service modularity, reliability, and maintainability for engineering and business stakeholders.
- Engineered AI-assisted applications with Python and FastAPI using Large Language Models, Retrieval-Augmented Generation (RAG), vector embeddings, and semantic search to provide context-aware access to enterprise knowledge for research and operational users, supporting 10+ enterprise knowledge workflows.
- Developed full-stack capabilities using React.js, TypeScript, JavaScript, and REST APIs to deliver responsive user interfaces backed by scalable services for internal healthcare and business workflows.
- Containerized application and AI services with Docker and Kubernetes to establish consistent deployment environments, simplify service scaling, and support reliable cloud-native delivery across engineering environments.
- Built a centralized logging and monitoring solution by integrating Splunk with custom Spring Boot actuators, decreasing mean time to resolution (MTTR) for production incidents by 25%.
- Secured service-to-service communication across several internal microservices by implementing OAuth 2.0 and JWT authorization, protecting financial APIs processing
- Implemented machine learning pipelines and MLOps workflows using Python, PyTorch, TensorFlow, and model evaluation practices to operationalize predictive analytics use cases and improve collaboration between software engineering and data science teams, supporting 5+ model development and deployment workflows.

**Software Engineer, Isango, India** **Jul 2018 – May 2019**

- Developed Java and Spring Boot services to automate activity-data ingestion and synchronization for the travel marketplace, keeping tour pricing and availability current across Australian destinations for marketplace and operations teams.
- Implemented Kafka-based event processing with Redis and MySQL to propagate inventory changes in near real time, improving consistency between supplier activity data and customer-facing travel experiences.
- Integrated AWS services into marketplace data workflows to retrieve, archive, and monitor daily tour listings across key Australian cities, supporting international marketplace expansion and operational visibility.
- Integrated Cloudinary as an image manipulation and CDN layer to improve media delivery and support higher-quality marketplace imagery, reducing average page load times by 30% for customer-facing applications.
- Strengthened marketplace backend workflows using Java, Spring Boot, Kafka, Redis, MySQL, and REST APIs to create maintainable services and support reliable supplier inventory synchronization.

**Software Developer, Paytm, India** **May 2017 – Jun 2018**

- Developed backend payment-processing components using Java and Spring-based technologies to implement transaction and business workflows, improving maintainability of financial application services for product and operations teams.
- Engineered C++ components for performance-sensitive application processing to implement business logic efficiently, supporting responsive and reliable transaction-oriented workloads.
- Built REST APIs and SQL-based data integrations to connect backend services with customer-facing applications, enabling consistent transaction data flow across dependent application components.
- Implemented unit and integration testing with JUnit to validate service-layer functionality and reduce regression risk, improving release confidence for engineering and QA teams.
- Collaborated in Agile development cycles using Git and Maven to deliver incremental backend enhancements, supporting predictable releases and maintainable software delivery for product stakeholders.

## Education

**Masters in Computer Science,** Northwestern University **Jun 2021**