

AADITYA CHAUHAN

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Summary

Senior Software Engineer with 12+ years of experience specializing in large-scale search infrastructure, distributed systems, and AI-powered retrieval platforms. Proven track record designing and operating systems serving tens of millions of users, processing billions of records with strict latency and consistency requirements. Expertise in OpenSearch, real-time data pipelines, NoSQL databases, and integrating LLM/RAG capabilities into production systems.

Work Experience

Senior Software Engineer, Amazon

Seattle, WA

November 2019 – Present

Search Infrastructure & AI Integration

- Designed enterprise-scale search platforms using OpenSearch serving tens of millions of users, supporting complex multi-modal queries (text, metadata, temporal, spatial) with sub-second latency across billions of indexed records
- Led integration of semantic search capabilities including embeddings-based retrieval and hybrid search architectures combining BM25 lexical matching with dense vector retrieval, enabling natural language photo search
- Architected and deployed NER (Named Entity Recognition) system with scatter-gather architecture for query understanding, introduced offline evaluation frameworks (Inspect-Eval) to accelerate development cycles
- Designed and implemented RAG (Retrieval-Augmented Generation) pipelines for AI-powered photo search (AskPhotos), including deduplication support, hallucination detection, and guardrails

Distributed Systems & Data Infrastructure

- Re-architected MD5 deduplication system to remove upload dependency on search infrastructure—designed DynamoDB schema, implemented using server-side transactions at scale, launched across 3 global regions with zero customer impact
- Architected real-time event-driven indexing pipeline (CDMARS) processing millions of node events daily via Kinesis, with multi-consumer support, jittered retry mechanisms, and dynamic configuration—reduced indexing lag and improved system reliability
- Designed and launched location enrichment system integrating HERE Maps v7 APIs, developed heuristics for rich location extraction from coordinates
- Led multiple zero-downtime data migrations including DPBR migration (parsing 230 billion nodes) and search cluster cutovers with comprehensive rollback strategies
- Built generic backfill frameworks (S3BackfillBackupRunner) reused across multiple large-scale data migration projects

Technical Leadership

- Led cross-functional design discussions spanning search, storage, and client teams; drove consensus on complex architectural decisions including 1P/2P deduplication strategies and auth migration patterns
- Mentored engineers and interns on system design and delivery—intern project (getUsage re-architecture) successfully delivered; mentees completed complex system re-architectures independently

Software Engineer, Expedia

Seattle, WA

March 2018 – March 2019

- Designed real-time transactional event delivery system using dockerized microservices on ECS, enabling real-time monitoring of booking system health

- Led MySQL to Redshift migration of 1.2 billion records, achieving 200x query performance improvement with continuous replication using AWS DMS
- Built automated data reconciliation system comparing source databases against data lake using Hive with daily reporting

Graduate Teaching Assistant, The Ohio State University

Columbus, OH

January 2017 – May 2017

- Instructor for “Modeling and Problem Solving in Spreadsheets and Databases” (CSE 2111)

Senior Software Engineer, MyKaarma.com

New Delhi, India

July 2013 – August 2016

- Designed and built message search engine using Sphinx full-text search, reducing search latency from seconds to milliseconds for customer communication platform
- Built message tagging and filtering system using Elasticsearch enabling complex search and filter operations
- Designed bi-directional text forwarding system with intelligent routing algorithms handling high-volume customer communications

Education

Master of Science in Computer Science and Engineering

The Ohio State University, Columbus, OH

August 2016 – December 2017

Bachelor of Engineering in Electronics and Communication

Netaji Subhas Institute of Technology, New Delhi, India

August 2009 – May 2013

Technical Skills

- **Languages:** Java, Python, SQL, JavaScript
- **Search & Data:** OpenSearch, Elasticsearch, DynamoDB, Redis, MySQL, Redshift
- **Distributed Systems:** Apache Kinesis, AWS Lambda, SQS, Step Functions, Event-driven Architectures
- **AI/ML:** Semantic Search, Embeddings, RAG Pipelines, LLM Integration, NER Systems
- **AWS:** Lambda, ECS, ECR, Kinesis, DynamoDB, S3, API Gateway, DMS, CloudWatch, SQS, SNS
- **Tools & Frameworks:** Spring, Docker, CDK, Distributed Caching, Load Testing