

# TUSHAR LANGHNODA

Software Engineering Intern Candidate | Full-stack/Dev-Ops | Distributed Systems | Edmonton, AB

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## EDUCATION

### University of Alberta

Bachelor of Science in Computer Science (Major), Minor in Pharmacology

Edmonton, AB

Sep 2023 – Apr 2027

## RELEVANT COURSEWORK

- Data Structures & Algorithms, Object-Oriented Programming (Python), Database Management Systems, Operating Systems, Machine Learning

## PROJECTS

### Idemppo | Typescript, Node.js, PostgreSQL, Docker, Grafana, Pino, K6

Source code

- Engineered a distributed event delivery engine capable of processing **1.2M+ events** per hour within **< 6ms** latency with exactly once delivery guarantee
- Cut race conditions between multiple micro services workers to **0%** by implementing a competing consumer pattern using transactional row level locks.
- Improved scalability by **40%** by introducing a horizontal scale across event processors
- Achieved **0% failure rate** under peak usage by concurrent users by implementing custom exponential retry logic and dead letter queue to gracefully handle unnaturally failed events
- Secured webhook ingestion delivery preventing replay or timing based attacks by building HMAC SHA-256 signature verification with constant time comparison
- Visualized real-time system health and throughput by designing custom Grafana dashboards that correlated API latency with worker processing rates and error spikes.

### Octillion | Typescript, Node.js, Next.js, AWS Lambda, Qdrant, Flask, FastAPI

Live Demo

- Built a full-stack multi-document semantic search engine that follows Google's query Information Retrieval path, handling everything within **500ms over 400+ pages** of PDFs
- Improve Information Retrieval by **70%** by implementing query analysis, ranking algorithms and cross-encoding
- Reduced compute cost by **60%** by introducing 3-tier AWS Lambda functions
- Cut **p95 latency from 3.8s to 18ms**, achieving a **211x** faster search retrieval by adding a Redis cache layer.
- Improve **precision@5** by **75%** and reduce user click-depth by **58%** by introducing a Hybrid Search(keyword + semantic retrievals)
- Reduce database storage costs by **80%** and bypass the 1GB row limit for extensive blob data by architecting a split storage architecture between Postgres and S3.
- Decrease system error by **71%** by building production-level analytics and metric system using AXIOM

### RootSeek | React Native, Node.js, MongoDB, OpenAI API

Source Code

- Led 100% of development, building a scalable React Native mobile AI-powered journaling tool from scratch with a Node backend
- Deepen context-aware reflections by analyzing long-term entries.
- Increase users' engagement by **40%** by integrating NLP pipelines for personalized reflections.
- Improve reflection efficiency and accuracy by **60%** by building a pipeline with entity recognition and Intent extraction.
- Designed an immersive timeline experience by introducing horizontal navigation, media attachments, and auto audio playback

## TECHNICAL SKILLS

**Languages:** TypeScript, Python, JavaScript, C, SQL (PostgreSQL, MySQL), HTML/CSS

**Cloud & Infrastructure:** AWS (Lambda, S3, ECR, API Gateway, ALB), Docker, Serverless Framework

**Frameworks:** React, Next.js, Node.js, React Native, Flask, FastAPI

**AI & Data:** Qdrant (Vector DB), Redis, PostgreSQL, OpenAI API, LangChain, PyMuPDF

**Tools:** Grafana, Git, Axiom (Observability), Postman, Linux