

# Patrick Pei

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## EDUCATION

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### Northwestern University

Master of Science in Computer Engineering, GPA: 4.0/4.0

Evanston, IL

Sep 2020 – Dec 2021

### University of California, San Diego

Bachelor of Science in Computer Engineering, GPA: 3.7/4.0

La Jolla, CA

Sep 2016 – Jun 2020

## EXPERIENCE

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### Coursera

Senior Software Engineer

Mountain View, CA

Mar 2024 – Present

- **Allowlist Management Platform (P0 Initiative):** Led cross-functional P0 project with 4 engineers implementing near real-time data platform for enterprise contracts (10M+ learners), reducing customer onboarding from 2 weeks to under 10 seconds. Architected fault-tolerant Java/gRPC microservice with 99.9% uptime, handling 50K+ concurrent updates.
- **Badge Management Platform & Revenue Growth:** Spearheaded team of 3 engineers building real-time stream-processing platform for badge issuance across 500+ organizations, directly contributing to over \$10M in contract ACVs. Designed event-driven architecture using Kafka Connect CDC with Amazon MSK, achieving 99.95% data consistency.
- **Internal Tooling & Operational Excellence:** Launched Retool-based internal management platform reducing engineering operational overhead from 95 minutes to under 5 seconds (99.9% efficiency gain). Architected scalable ETL pipeline processing 100TB+ daily data from AWS RDS Aurora to Snowflake EDW.

Software Engineer II

Mar 2023 – Mar 2024

- **Clips Management Platform (Large-Scale Distributed Systems):** Led team of 3 engineers architecting fault-tolerant distributed system for video clips metadata management serving 100M+ course views globally. Implemented event sourcing with CQRS pattern, achieving 80% faster metadata updates through parallel processing and optimistic locking.
- **Performance Engineering & Caching Strategy:** Designed and implemented distributed Redis Cluster (20+ nodes) reducing P95/P99 API latency by 80%/92% respectively for 50K+ QPS. Built application-level distributed transactions with saga pattern ensuring ACID properties across 15+ microservices.
- **Microservices Architecture & Scalability:** Architected Java Spring Boot microservices with hexagonal architecture supporting 1M+ concurrent operations. Implemented circuit breaker patterns, bulkhead isolation, achieving 99.95% availability during 10x traffic spikes.

Software Engineer I

Jan 2022 – Mar 2023

- **Large-Scale Migration Platform & Technical Leadership:** Led critical Contract and User service migrations from Scala to Java affecting 50M+ users, phasing out 12 legacy APIs and eliminating 5K+ lines of technical debt. Architected zero-downtime migration library with automated dual-write/read strategy, deployed across 15 migrations with 99.9% success rate.
- **High-Performance gRPC APIs & Service Mesh:** Designed and implemented 19 production gRPC microservices handling 3.2K+ QPS with 98% test coverage. Built learner profile service supporting 200+ QPS with sub-50ms P95 latency, integrated with Istio service mesh for observability.
- **Distributed Systems Architecture & Data Processing:** Architected event-driven microservices ecosystem processing 1B+ events daily with Apache Kafka and Confluent Schema Registry. Implemented eventual consistency patterns and distributed tracing achieving 99.99% data delivery guarantee across 20+ services.

## TECHNICAL SKILLS

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- **Languages:** Java (Expert), Scala, JavaScript/TypeScript, Python, SQL, C++, GoLang
- **Distributed Systems:** Apache Kafka, gRPC, GraphQL, Microservices, Event Sourcing, CQRS, Saga Pattern
- **Cloud & Infrastructure:** AWS (EKS, MSK, RDS Aurora, DynamoDB, Lambda, S3), Kubernetes, Istio, Terraform
- **Data & Caching:** Redis Cluster, PostgreSQL, MySQL, MongoDB, Snowflake, Apache Airflow, ETL Pipelines
- **DevOps & Monitoring:** Docker, Jenkins, Jaeger, Prometheus, Grafana, CI/CD, Infrastructure as Code