Davayan Sanyal

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Summary: Backend Software Engineer with expertise in Golang, AWS, and distributed systems, with a secondary focus on AI/ML tooling and multi-agent systems. Experienced delivering production-hardened services across the full stack — infrastructure, observability, performance, and security.

Skills

Languages: Go, Python, JavaScript, TypeScript, Java, C/C++

Backend & Infrastructure: REST APIs, Microservices, OAuth2, AES-GCM, AWS CDK, Lambda, Fargate/ECS, IAM, Secrets Manager, Route53, Docker, IaC, CloudFormation, CI/CD, Git

DataBases: PostgreSQL, MongoDB, DynamoDB, Snowflake, Supabase

Observability & Performance: OpenTelemetry, K6, pprof, goroutines & concurrency, CloudWatch, P50/P90/P95 SLA definition

AI/ML: LangChain, LangGraph, multi-agent systems, RAG, vector databases, embeddings, prompt engineering, LLM evaluation, Claude Code, TensorFlow, PyTorch, Computer Vision

Work Experience

Software Engineer - Associate Aug 2025 - Present
Capital One – Card Tech McLean, VA

- Owned end-to-end development of Capital One's first Golang REST API for account status modernization across the full stack — application architecture, OAuth2 security, AWS CDK infrastructure, observability, and performance — delivering from zero to production-hardened over 4 months.
- Migrated core account services API from AWS Lambda to Fargate using CDK with distroless Docker containers; demonstrated 5–10× better P95 latency over the serverless baseline, securing executive approval to adopt Fargate as the team's primary architecture and unblocking a separate service onboarding.
- Diagnosed a critical memory leak across 10,000+ concurrent requests using pprof heap profiling, tracing root cause to unclosed response bodies in nested logging middleware — eliminating OOM container crashes at peak load.
- Designed a cross-language performance testing architecture bridging a K6/JS load testing engine with Golang services; ported AES-GCM encryption from Go to JS with verified cipher parity to enable production-realistic encrypted load tests.
- Built asynchronous telemetry middleware in Go using goroutines and buffered channels, capturing downstream error metrics via OpenTelemetry with zero impact on P95 response time.
- Diagnosed a silent Docker image artifact-mapping failure in Capital One's central AWS CDK deployment pipeline from source code, engineering a fix and sharing root cause findings that unblocked multiple teams across the entire tech tower.
- Built a shared Claude AI tooling repository adopted across 5 modernization teams with a symlink-based integration system, leading to a multi-agent workflow cutting API modernization effort from 2 weeks to half a day.

Software Engineering Intern June 2024 – Aug 2024
Capital One – Card Tech New York City, NY

- Built AWS Lambda feedback loop API for a merchant classification ML model processing 30B transactions/year, cutting misclassification rate by 45% across 200+ monthly reports.
- Implemented Route53 multi-region failover and DynamoDB–Snowflake analytics pipeline, achieving 99% resiliency at 100ms response time across 1,000+ data stores/month.

Research Assistant Dec 2023 – Nov 2025
University of Maryland – Department of Finance College Park, MD

- Optimized Professor Pete Kyle's financial market order book simulation by migrating NumPy/Pandas data structures to PyTorch, improving computational throughput for high-frequency trading research.
- Built automated OCR pipeline digitizing 4,000+ noisy historical financial articles using Tesseract, docTr, and EasyOCR; benchmarked 15B–70B parameter LLMs (Llama, Command-R, Mixtral) to support historical financial dataset digitization for Professor Serhiy Kozak.

Software Engineering Intern Jun 2023 – Aug 2023
Capital One – Cyber McLean, VA

- Built React/Node.js case management system for 25+ cyber analysts processing 1,200+ weekly alerts on MongoDB/AWS; automated case routing reducing threat-tracking overhead by 90%.

Projects

ReciMed: AI-Powered Medical Recipe Generator | Palantir AIP Platform July 2025

- Built an AI-powered recipe generator on Palantir AIP that identifies ingredients from photos using computer vision and generates medication-safe recipes via RAG over 1,000+ cookbook chunks and 500+ healthcare papers — achieving 95%+ cuisine classification accuracy and drug-food interaction checking for 200+ medications

Eventure: AI Powered Social App Apr 2024

- Built a full stack Next.js/Supabase app using Gemini AI and prompt engineering to generate and categorize 400+ city events based on user interests; used by 90 students with 80% activity match success rate within 36 hours of launch.

Education

University of Maryland, College Park Aug 2021 - May 2025
Dual Degree: B.S in Computer Science & B.S. in Mathematics GPA: 3.82/4.00
Certificates: AWS Solutions Architect Associate, IBM Advanced Deep Learning Specialist