

SAPTARSHI BHATTACHARJEE

3604 Flora Vista Ave Apt 119, Santa Clara, CA 95051 | bsaptarshi52@gmail.com | 716-348-7370 | [linkedin.com/in/bsaptarshi](https://www.linkedin.com/in/bsaptarshi) | github.com/bsaptarshi

Staff-level Backend & Platform Engineer with 12+ years driving billion-request, business-critical Tier-0/Tier-1 platforms. Architected foundational subscription, checkout, and identity systems for 300M+ global users; currently driving capacity efficiency, hardware management, and identity resolution/cost attribution for Meta's Ads and Monetization stack, alongside director-level agentic infrastructure initiatives. Proven track record scaling subscription, offers, and ML-driven personalization platforms to billions of daily decisions while partnering with Product, GTM, and marketing leadership on adoption, retention, and market-expansion strategy. Trusted advisor to leadership and C-suite, and Tech/Security/Privacy Bar Raiser, specializing in distributed systems, platform design, capacity attribution, and agentic AI.

EXPERIENCE

Senior Software Engineer — Meta — Data Foundations Platform, Monetization & Ads

Jun 2026 – Present

- Strategic Hardware Attribution & Governance:** Secured executive sponsorship for a next-generation hardware attribution and governance platform, driving capacity efficiency and hardware management for Meta's Ads and Monetization stack — spanning identity resolution and cost/usage attribution by business entity, service group, and load-bearing relationship, with multi-layer business-unit aggregation and usage-leakage telemetry for continuous governance and automated enforcement.
- Agent-First AI Mesh for Ops Automation & Triage:** Leading agent-mesh AI initiatives for on-call automation, incident investigation, and self-triage, designed to coordinate agents across client and upstream requests, on-call incidents, and historical issue triage to accelerate resolution.
- Engineering Excellence & Data Quality:** Driving smoother on-call operations and org-wide data freshness and correctness by tracing raw telemetry through aggregation into business-level metrics, surfacing data gaps, legacy hosts, and fleets managed outside service-level ownership while standardizing RFC and change-review practices.

Sr. Software Development Engineer (Tech Lead) — Amazon

Feb 2023 – May 2026

Bar Raiser: System Design, Change Control, Privacy & Security | Technical Mentor | Advisor to Leadership | 5 awards and multiple year-over-year top-tier recognitions

- Tech lead for two cross-functional teams of 15 engineers driving high-impact initiatives across Amazon Music Subscriptions, Offers & Promotions, Campaigns, and Accounting platforms spanning 65+ markets worldwide.
- Tier-1 Offers & Eligibility Platform:** Scaled Amazon Music's core Tier-1 offers and subscription eligibility platform toward 700M–1.2B daily decisions with 25K TPS peaks, serving 3B+ requests/day while reducing P99 latency from ~300ms to <50ms by redesigning core APIs and onboarding 32 client services onto a single global source of truth for all promotional campaigns and paid subscriptions.
- Contextual Offer Eligibility Framework:** Lifted offer acceptance by 35% and partner-channel conversion by 40% while cutting invalid offer presentations by 95% at <50ms latency, by designing a dynamic context-propagation framework adopted across 500+ surfaces and 13+ partner channels, generating \$7.5M+ in incremental annual revenue.
- Enterprise Auth & Compliance Modernization:** Eliminated 120+ SDE-months of annual maintenance overhead (60% reduction) and protected 100+ downstream services from regulatory risk, by consolidating 3 fragmented identity APIs into a unified, personalization-aware platform and migrating 23 client services in 3 months — establishing an extensible foundation for GDPR, COPPA, CCPA, DMA, and Canadian and U.S. state-level (including teen-privacy) compliance.
- Gamification Platform Strategy:** Identified and drove a bottom-up, org-wide initiative — atypical in Amazon's top-down customer-facing orgs — to unify web, Android, and iOS on a shared React Native + GraphQL stack; built director-level alignment to enshrine it in a 3-year and 5-year roadmap, launched FanQuest, Ritmo, and Listening Streaks (saving 8–10 weeks per pilot via infrastructure reuse), and laid the strategic groundwork for the long-term OEM/vendor partnership push (Samsung, Tesla, Garmin) described below.
- Third-Party Partner Offers Platform:** Led a major roadmap expansion of a cross-platform partner framework into a pluggable, context-aware targeting platform supporting custom propensity/MAB (multi-armed bandit) models and cross-business, first- and third-party (1P + 3P) signals — e.g., surfacing subsidized Echo + Music bundles to engaged Alexa users without a Music plan — across six payment methods and partners including Samsung, Tesla, Garmin, Nissan, Lenovo, and Best Buy, powering Samsung's device-setup and out-of-box offer surfaces and a critical India launch.
- Amazon Music India Launch:** Led India-specific payment eligibility and signup architecture for UPI and other payment flows, with risk-score-based optimistic vs. pessimistic fulfillment and grace/rollback state management to protect promotion eligibility on abandoned validations.

Software Development Engineer — Amazon

Mar 2020 – Jan 2023

- Cross-Platform Subscription Bundle Launch:** Improved end-to-end checkout latency by 5X (22s to 4.5s), reduced cart abandonment by 85%, and increased premium conversion by 27%, by re-architecting the checkout flow from a two-step process into a single unified operation with a predictive API-warming strategy — launched simultaneously across 8 markets with zero downtime, earning an Amazon Music Award.
- Free HD Tier Rollout:** Drove a 13X signup surge (113.8% daily signup increase, 12,225% upgrade-volume increase) across 70M+ users by delivering a free-tier HD rollout under an aggressive S-team priority — completing system design in 24 hours, core implementation in 4 days, and production deployment in 2 days with zero incidents, earning Amazon's highest recognition.
- Personalized Plan Upsell & Cross-Sell Engine:** Designed and piloted a real-time, MAB-driven personalization engine offering customers a better-fit plan (e.g., individual → family) or a propensity-based Prime upsell immediately post-signup while preserving existing promotional benefits; scaled from prototype to a shared platform adopted across Amazon Prime, Prime Video, Audible, and Kindle, plus external partners including Disney+.
- Cross-Product Targeting Engine:** Delivered real-time cross-product targeting at <100ms latency with zero production incidents by rearchitecting a compatibility layer that unified eligibility across 8 backend platforms with incompatible tiers through a full ETL-powered rearchitecture of static segment signals — launched across all global Amazon Music marketplaces, lifting customer acquisition and retention by 23% and 13% respectively.
- Subscription Ordering & Third-Party Mobile Payment Platform Integration:** Protected \$50M+ in annual revenue and retained 20M+ subscribers by leading a compliance-driven overhaul across 10+ enterprise systems in two months, enabling in-app subscription creation via Apple In-App Purchase and Google Play Billing (previously mobile-web-only) and supporting the platforms' multi-platform exemption for native Amazon Wallet (1P wallet) payment — achieving 100% compliance with zero incidents; the delivery led directly to promotion to Tech Lead for the Offers Platform team.

Chief Software Architect — Applied Research Works

Apr 2017 – Feb 2020

- Reported directly to the CTO and the CEO's office as primary technical advisor and business advisor, owning the technical vision, architecture decisions, and business roadmap for an organization of 80+ software and data engineers.
- AI-Powered Cloud EHR Platform:** Delivered a unified provider, patient, and admin EHR portal adopted by 10+ clients, as a founding engineer for an AI-powered cloud platform.

- **ML Model Lifecycle & Platform Engineering:** Built an end-to-end applied ML platform — training infrastructure, Spark + Kafka feature pipelines, and recursive feature elimination (gradient boosting/random forest importance-driven refinement feeding Bayesian, logistic, and linear regression models) — for CHF, COPD, CKD, Diabetes, and elderly fall-risk prediction, with evaluation gating (sensitivity/specificity/accuracy) reducing training runtimes 3X and processing 1M+ clinical notes/month at 95% accuracy.
- **Model Serving, MLOps & Interpretability Tooling:** Served predictions via real-time inference API into Epic, Elation, and Cerner (enabling \$2M+ revenue), backed by an MLOps continuous-retraining (data-flywheel) pipeline capturing production feedback into the raw data store; built a JavaScript model-interpretability tool exposing model/feature weights for human-in-the-loop verification and governance by clinical admins.

Senior Software Developer (Tech Lead) — Applied Research Works

Apr 2016 – Apr 2017

- **EHR Performance & SDoH Risk Tooling:** Improved EHR latency by 70% and prediction accuracy by 30% with a social-determinants-of-health (SDoH) risk tool, and created a data protocol adopted by 3 hospital systems for real-time risk-score report exchange.
- **Distributed Medical Record & Interoperability:** Led design and development of a distributed medical-record tool for large-scale healthcare systems, including a hybrid datastore for structured and scanned web-form data and a protocol for exchanging clinical and administrative health information.

Early Career — Applied Research Works

Jun 2012 – Aug 2015

- **Software Engineer / Tech Lead (India, Jul 2012–Jul 2014):** Led a team of 2–4 engineers building SaaS applications for the US healthcare sector on a hybrid LAMP + Java stack, mentoring interns and new hires and partnering with PMs on feature planning, development, testing, and deployment.
- **Machine Learning Engineer Intern (US, Jun–Aug 2015):** Built supervised chronic-disease prediction models (Logistic Regression, Decision Trees, SVMs) on ANSI X12 EDI claims data, and built analytics/visualization tooling (PHP, D3.js, Redshift) still in production over a decade later.

LEADERSHIP & TECHNICAL INFLUENCE

- Tech lead or higher for the majority of career, including 3.5+ years at Amazon leading two cross-functional teams of 15 engineers across Subscriptions, Offers & Promotions, Campaigns, and Accounting platforms serving 65+ markets.
- **Bar Raiser:** Served as Bar Raiser for System Design, Change Control, and Privacy & Security, conducting interviews, raising engineering hiring standards, and reviewing design, change, and security readiness — extending bar-raising rigor into operational excellence practices across teams.
- **Mentoring & Career Growth:** Onboarded and mentored new hires and existing engineers, coached engineers through promotion paths and career-growth planning, and ran structured 1:1s to develop technical and leadership capabilities across the team.
- **Executive Technical Advisor:** As Chief Software Architect reporting to the CTO and the CEO's office, advised leadership on technical solutions and business-roadmap trade-offs, aligning engineering investments with company strategy for an 80+ engineer organization.
- **Technical Strategy & Roadmap Ownership:** Defined charters and multi-year technical roadmaps for org-wide topline goals, from problem definition through technical strategy to long-term delivery — scoping and hedging new bets from prototype through productionized, hyperscale platforms at the cutting edge of Big Tech infrastructure.
- **Cross-Functional & GTM Partnership:** Partnered with Product, GTM, and paid-media/marketing leads on adoption strategy and market expansion, working closely with non-technical stakeholders to track usage, retention, and leakage metrics and prevent churn.

INDEPENDENT PROJECTS (SELECTED)

- **agentbelt:** AI infrastructure tooling through Python packages that give autonomous agent systems the reliability guardrails standard observability stacks miss — circuit-breaking, loop detection, and agent-aware monitoring to catch stuck or runaway agent behavior before it burns compute cycles or masks real incidents.
- **ladon-ml:** Building a vendor-agnostic autonomous zombie-accelerator detection & reclamation project that detects GPUs/accelerators falsely reporting 100% utilization while actually deadlocked or stalled, reclaiming idle capacity that otherwise burns thousands of dollars/hour across training clusters.
- **Agentic Version Control & Provenance System (early-stage):** Researching and designing an open-source system for versioning agentic workflows, tool calls, decisions, and execution provenance — with Git-like history, transactional state, and auditable rollback/reconstruction.
- **Open-Source Contributions:** Also contributes to major open-source Java SDKs — diagnosed and landed a fix for an IPv6 address-parsing bug in Google Guava (google/guava#8206); proposed a purpose-aware multipart upload fix for the OpenAI Java SDK (openai/openai-java#740, in review).

TECHNICAL SKILLS

Languages & Frameworks: Java, Python, React, JavaScript, TypeScript, Kotlin, Spring, Hibernate, FastAPI, gRPC/Protobuf

Distributed Systems & Cloud: AWS (API Gateway, Lambda, DynamoDB, Redshift, CDK), Kafka, Flink, RabbitMQ, Docker

Data & Observability: Postgres, MySQL, MongoDB, Elasticsearch, Databricks, OpenTelemetry, Prometheus, Grafana

Architecture, Reliability & Security: Large-scale system design, Microservices/SOA, API governance, IAM, SAML, OAuth, Threat Modeling, Security & Regulatory Compliance (GDPR/DMA), SLOs & Error Budgets, Chaos Engineering, Traffic Shaping, Tuning

AI/ML & Agentic Systems: LLM orchestration & multi-agent systems, agent reliability & observability (circuit-breaking, loop detection — agentbelt), telemetry-driven anomaly detection (ladon-ml), Spark, Scikit-learn, Pandas, applied ML lifecycle (training, inference, monitoring, A/B testing, batch/streaming pipelines)

DevOps & Engineering Excellence: CI/CD Pipelines (Jenkins/GitHub Actions), IaC, Release Management, Operational Excellence

EDUCATION

M.S. in Computer Science, University at Buffalo, State University of New York

Aug 2014 – Feb 2016

B.Tech in Information Technology, Institute of Engineering & Management, Kolkata

Aug 2008 – Jun 2012

PUBLICATIONS

Co-authored two peer-reviewed papers on biometric pattern recognition, still drawing citations in the literature through 2025 (40+ citations to date):

- Saptarshi Bhattacharjee, S Arunkumar, Samir Kumar Bandyopadhyay — *Personal Identification from Lip-Print Features using a Statistical Model*. International Journal of Computer Applications (0975–8887), Volume 55–No.13, October 2012.
- Samir Kumar Bandyopadhyay, Saptarshi Bhattacharjee, S Arunkumar — *Feature Extraction of Human Lip Prints*. Journal of Current Computer Science and Technology, Vol. 2 Issue 1 [2012] 01–08.