

FRANK MÜLLER

Staff Engineer / CTO — Enterprise AI, Evaluation & Regulated Systems

Cancún · frank@singularcontinuum.com · singularcontinuum.com/frankmuller · +52 55 4447 3061 ·
linkedin.com/in/frank-muller-electronics · github.com/frankie-muller

EXPERIENCE

CTO & VP of Product, Authentia — Remote | 2022–Present

Authentia Digital Product Passport (2022–present) and **Authentia Enterprise Intelligence** (2025–present).

- Built a seven-model evaluator panel that prices high-value collateral across six asset classes — diamonds, aviation, fine art, real estate, luxury watches, exotic autos — and grades every model against a recorded price book of real sales and live asks. The models are graded, never trusted: consensus may only fill cells where no evidence exists, only while it improves the score, and never the graded cells themselves. A cycle that makes the book worse is quarantined and the class reverts. Model selection becomes an evidence question rather than a vendor argument.
- Enforced the boundary in code: no LLM adapter is a pricing path, and that is machine-checkable rather than a matter of discipline. A deterministic kernel is the only thing that prices collateral, computes premium from rate tables, and sets review routing. Each asset class plugs in as its own kernel behind a shared evidence and policy contract — six so far, exposed as callable tools. Models supply judgement; the kernel supplies every number. When the kernel has to guess at a value rather than source it, that guess is capped below every asset class's lending threshold, so the loan comes out zero — enforced by a test across all six classes, not by a rule someone can switch off.
- Built a self-consistency gate for a non-deterministic mixture-of-experts model: the same case is reasoned twice and the binding cores compared. On divergence the system refuses to auto-bind — forces a refer, clamps confidence to zero, and routes to a reliability queue that preempts every risk queue.
- Designed and built the governance and data layers myself: an append-only, hash-chained ledger that seals every judgement — 101,000+ events, verifying end to end.
- Made prompts a measurable calibration surface: six per-class prompts, versioned and attributed like constants, with the version sealed onto every evaluation, so a drift reading can be attributed to the question that produced it.
- Built the evidence layer the valuations run on: a per-class grid that ingests market data, auction results, and expert anchors into priced cells. Expert anchors dominate their cell; displaced market points are recorded, never deleted; a cell's confidence is capped at its weakest source, because provenance can only be as strong as its weakest hop. Raw and live values sit side by side so drift stays visible.
- Architected digital product passports for diamonds, luxury goods, and other high-value assets — a cryptographically anchored digital twin per item, origin through manufacturing to finished piece.
- Co-invented a computer-vision pipeline fusing laser marking with crystallographic topography analysis to defeat counterfeit provenance markings — patent application pending, named inventor.
- Led the technical sales cycle with a global luxury jewelry house whose alphanumeric laser tags were being reproduced on lab-grown stones — diagnosed the failure mode and negotiated adoption of crystallographic topography analysis in their place, replacing a mark that can be copied with a signature intrinsic to the stone.
- Built and lead the engineering team: sourced, interviewed, and hired all 4–6 engineers across both product lines.

VP of Product, GigaStar — Remote | 2021–2022

- Led a 6–8 person team to stand up GigaStar end-to-end — the first SEC-regulated (Reg CF) crowdfunding platform for YouTube creators, letting fans participate directly in channel revenue.
- Structured fractional royalty offerings as compliant securities: creators raised immediate capital while token holders earned a share of monetized channel revenue.
- Designed tiered, time-bound offering events that converted fan audiences into investors and gave creators liquidity without ceding ownership of their channels.

Lead Product Manager, Galaxy — GA Tech Solutions, Cancún | 2018–2021

- Took the Galaxy ticketing system into the Latin American market from zero, owning the full enterprise cycle personally — demos, technical evaluation, closing the sale, and on-site installation — resulting in 12+ enterprise implementations across five countries to date.
- Led a 15+ person team delivering those implementations.
- Opened and led a new business line in 2021: distributed plug-and-play Ethereum validator hardware and stood up a validator staking operation.

CTO, Ultramar Ferry — Cancún | 2017–2021 (*engagement delivered through GA Tech Solutions*)

Largest ferry operator in the Caribbean. 30M+ passengers boarded through the platform; in production since 2018.

- Led an engineering organization of 20+ developers plus implementation, communications, maintenance, and navigation technicians under team leads.
- Hired and trained my own successor as CTO, handing over the platform and the engineering organization intact — still in production five years on.
- Took the operator from paper-based workflows to one integrated platform: ticketing, facial-recognition access control, POS and mobile POS, back-office tooling, executive dashboards.
- Owned production operations down to the physical layer — hands-on managed the dedicated undersea fiber links connecting Cozumel, Isla Mujeres, Cancún, and Playa del Carmen, and installed the hotspots carrying access control, mobile, and mobile POS traffic. Kept a platform boarding millions of passengers a year running through Caribbean hurricane seasons.

Farmacias Especializadas — Mexico City | 2013–2017

LatAm's leading pharmaceutical enterprise: 100+ owned pharmacies plus independent affiliates across the region.

VP of Technology | 2015–2017 — *promoted from Solutions Architect*

- Managed 16 direct and 45 indirect technologists across the design, development, and support of every application running the enterprise.
- Introduced co-insurance at point of sale — insurer-settled benefit discounts applied at the register, replacing pay-now-reimburse-later and materially improving patient access to medication.
- Rebuilt point-of-sale, warehouse management, provider sourcing, and billing/invoicing as one unified stack.

Solutions Architect | 2013–2015

- Migrated per-pharmacy on-premise servers to cloud infrastructure with zero disruption, under live commercial demand, without closing a single register.

SHIPPED SOLO

Octopus — hi-fi music player for Apple platforms, live on the App Store. A React Native product shell over a C++/Swift audio engine I wrote: hand-rolled crossfeed AudioUnit, AVAAudioEngine, Accelerate, on-device library intelligence, plus CarPlay, Live Activities, App Intents and a watchOS companion. Architected and shipped solo, end to end with Claude Code.

Brutal — offline-first iOS app that turns something you say about yourself into a brutalist business card, exported as a live Apple Wallet pass: change your details and every card you have ever handed out updates itself. Speech recognition and the model that cleans up the transcript both run on the phone; the only thing that leaves the device is a set of one-way hashes, sent to an attested signing service that cannot reconstruct the card and stores nothing. Swift and SwiftUI, cross-platform rendering core, real PKCS#7 pass signing.

SKILLS

- **AI/ML:** enterprise AI evaluation (champion/challenger, agreement/drift/compliance scoring), multi-agent orchestration, evidence-grid and provenance modelling, on-device inference (Apple FoundationModels, on-device speech), computer vision (OpenCV, EasyOCR, dot-peen marking SDKs; contour extraction, Hu moment shape descriptors, Laplacian focus analysis), multi-model evaluation harnesses (Claude, Gemini, DeepSeek, Qwen, Mistral, Llama, gpt-oss)
- **Platforms:** Python, TypeScript, Node.js, React/Next.js, React Native; Swift, C++; SQL, Postgres, Redis, OpenSearch, SQLite; CI/CD, serverless, edge/CDN, observability
- **Security & compliance:** audit logging and tamper-evident decision trails, cryptographic provenance and signing, SEC Reg CF compliance delivery
- **Engineering leadership:** teams to 16 direct / 45 indirect; hiring, delivery cadence, release quality, technical direction

EDUCATION & CREDENTIALS

- **B.S. Electronics Engineering** — Tecnológico de Monterrey · Professional Concentration in Telecommunications (2013)
- Toptal — verified Top 3% · IBM watsonx Engineering Partner · Apple Developer Program (App Store) · Cisco Certified Network Associate, CCNA R&S · Galaxy Certified System Administrator, Gateway Ticketing Systems (2019)
- Point Blank Music College London — Music Technology
- Languages: Spanish and English — native bilingual
- Ironman 140.6 finisher (2025)