

Jozef Rudy, PhD

Quant Developer → Type-Safe, AI-Native, Fintech Systems

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TECHNICAL SKILLS

Languages: F#/C#, Python, TypeScript, Rust, Nix

Databases: PostgreSQL (pg vector), ClickHouse (time-series), DuckDB (analytical), LanceDB (time-series, vector)

Frontend: Angular, SolidJS

DevOps: Docker Swarm, Ansible, Vector

Type-Driven Engineering: pairs well with *LLM* development, domain models as ADTs with invalid states unrepresentable, *SQLx* offline-checked queries, *OpenAPI* → *Orval* codegen, railway-oriented `Result/TaskResult` error handling.

Distributed Systems: Event-driven architectures with message streams, distributed locking, horizontal scaling of compute and storage, microservices, real-time data processing pipelines

DOMAIN EXPERTISE

Quantitative Finance: Statistical arbitrage, pair trading, factor investing, portfolio optimization

Trading Strategies: Long-only, long-short (cointegration, correlation), market seasonality, tactical asset allocation

Risk Management: Real-time P&L tracking, position monitoring, portfolio risk analytics

EXPERIENCE

2026 Jan – Now

Merit Holdings, *Senior Developer*, Remote

- Reproducible dev/CI environments via Nix and `devenv.sh`.
- Engineering workflow voice assistants built with Pipecat, Whisper, LangGraph on Google Cloud Services.
- Refactored marketing agents from custom flows to LangGraph for maintainable state machines.
- Tech stack: F#, C#, Python, Google Cloud Services, Nix.

2025 – Now

KarmaKit, *Founder and core developer (side project)*

- Reddit monitoring platform with semantic search, AI comment generation via RAG, and real-time alerts.
- *Typed query DSL*: FParsec parser (backend) + Lezer grammar (frontend) for advanced post filtering with semantic search support; malformed queries fail at the parse boundary, not inside the pipeline.
- *Data pipeline*: 500 posts/10s from Reddit → verification → batched embedding generation → spam detection (simhash + rate limiting) → semantic search matching → real-time SignalR notifications.
- *Architecture & scaling*: multiple IHostedService workers coordinated via Redis Streams consumer groups for distributed processing, Railway-oriented error handling with TaskResult throughout, SignalR Redis backplane enables horizontal scaling of API instances.
- *Tech stack & deployment*: F# backend, Angular 20 with signals and zoneless change detection, PostgreSQL + pgvector, llama.cpp for self-hosted embeddings (BGE-small-en-v1.5), LiteLLM for LLM access, Go Playwright wrapper. Deployed via Docker + Ansible to CoreOS, Vector for observability.

2024 – Now

CryptoQuant, *Founder and core developer (side project)*

- Web app offering 1-min frequency charts, extended statistics for 7000 cryptocurrencies, backtest/live tests for liquid crypto currencies. More details on the [blog](#).
- *Backtest engine*: custom domain language with intellisense on frontend, backend validation and parsing into runnable code, execution on backend with results inspection.
- *Architecture & scaling*: Majestic monolith with event-driven design, message streams for real-time market data processing, postgres job queues via skip locked, distributed locks for concurrent job execution, horizontal scaling across multiple service instances.
- *Tech stack & deployment*: F# backend, Angular with Blockly creating strategies, PostgreSQL for persistence, Clickhouse for analytics, Redis Streams for distributed processing. Deployed via Docker + Ansible to CoreOS, Vector for observability.

2019 – 2024

Metagora, *.Net Core Quant Developer, Remote*

- Developed trading systems and analytics for portfolios worth \$10 million across multiple strategies.
- *PnL calculation system*: designed official daily PnL engine with mathematical expression parser supporting fund comparisons (e.g., $(\text{fund_A} - \text{fund_B}) / \text{fund_B}$ for tracking error) and on-the-fly portfolio scenarios; initially Python, later rewritten in F# with type-safe expression trees and explicit result types.
- *Real-time price infrastructure*: built tick-to-bar aggregation pipeline producing 1-second bars from multiple brokers/providers via gRPC, stored in Postgres + Clickhouse.
- *Live PnL engine*: implemented instrument-level real-time PnL tracking using broker position/trade streams with multi-level aggregation (instrument, account).
- *Quality & monitoring*: added comprehensive unit/integration tests, continuous refactoring for robustness, Angular dashboard with ECharts for price/PnL analysis.
- *Tech stack & deployment*: F#, .NET Core, Python, gRPC, PostgreSQL, Clickhouse, Angular, RxJS, ECharts. Deployed to AWS (EC2, RDS).

2018 – 2019	Kapital Trading, <i>Quantitative Analyst/Developer in Python/Java</i>, Remote • Hedge fund specializing in futures calendar spreads with directional risk hedging using principal component analysis. • Fixed critical bugs in contract rolling logic and spread product handling. • Extended core Java platform functionality for strategy development and testing.
2017 – 2018	BetaSmartz, <i>Python Developer</i>, Remote • Robo-advisory platform with Markowitz and Black-Litterman optimal portfolio allocation. • Designed and implemented execution engine for automated rebalancing and order management. • API integration with Interactive Brokers for live trading. • <i>Tech stack</i>: Python, Pandas, Django.
2015 – 2016	Metatron Capital, <i>C# Developer</i>, Bratislava • Developed HFT trading platform for backtesting and live trading of quantitative strategies, primarily on futures markets, video. • Built end-to-end system handling strategy research, backtesting, optimization, and live execution. • Developed Tactical Asset Allocation Backtester, video.
2013 – 2015	Harvest Alpha Capital, <i>Advisory Board Member</i>, Malta • Managed \$2 million fund focused on systematic strategies. • Research and execution of daily frequency and highly scalable strategies. • Investment process based on value, low volatility, carry and momentum across all asset classes.
2011 – 2013	Horus Partners Wealth Management Group SA, <i>Senior Quantitative Fund Manager</i>, Geneva • Developed quantitative strategies for a boutique family office with \$100 million AUM. • Development of the <i>market seasonality strategy</i>. • Automation of parameter optimization for <i>TVVR platform</i> using genetic algorithm on integer data. • Responsible for trade execution for <i>seasonal platform</i> and risk management of <i>TVVR platform</i>.
2010 – 2011	Tatra Asset Management, <i>Risk Manager</i>, Bratislava • Market leader in asset management market in Slovakia and regional centre of investing for CEE, 2 bn EUR AUM. • Development, analysis and backtesting of quantitative trading strategies at daily frequency in all highly liquid markets. • Analyzing and recommending changes to the portfolios of models.
2007 – 2009	Kutxagest, <i>Fund of funds manager</i>, San Sebastian • Mutual and pension fund asset management with ~ 2 bn EUR AUM. • Portfolio Manager of <i>Altair</i> (fund of funds), managed quantitatively. • Implementation of quantitative models (alpha detection, detection of fund's holding based on cointegration approach against major asset classes) for the remaining funds of funds based on well functioning <i>Altair</i> fund (3rd best in its category in Spain in 2008).

EDUCATION

- 2009 – 2011 **Liverpool John Moores University**, *PhD in Quantitative Finance*
- Thesis: *Four Essays in Statistical Arbitrage in Equity Markets* ([publications](#))
 - Research on statistical arbitrage in shares and ETFs, covering pair trading strategies and modeling techniques from OLS regression to Kalman filter. Found innovative adjustments to existing strategies could achieve Sharpe ratios above 2.
 - Defended June 2011 - External examiner: Roy Batchelor, Professor at Cass Business School
- 2005 – 2008 **Aarhus University**, *MSc. in Finance and International Business*
- 2006 – 2007 **University of Deusto**, *Master in Finance and Accounting, Dual Degree with Aarhus*
- 2001 – 2007 **University of Economics in Bratislava**, *Master in International Economic Relations*