

Yerbol Akhmetbekov

Location & Status

Fort Myers, FL, United States • Green Card Holder

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SUMMARY

Principal Engineer and Platform Architect focused on **model risk and AI governance** — pairing a GARP Financial Risk Manager certification with hands-on design of production LLM systems and the control systems that keep AI agents safe to run.

- **PhD in Computer Science** from Novosibirsk State University (h-index: 7), with a 10+ year career in **Software Engineering** designing secure, scalable, API-first platforms using Python, Java, C++, TS, and AWS.
- **LLM and ML Engineer** with 5+ years in data science (Pandas, NumPy, SciPy, Scikit-Learn; statistics, PCA, TF-IDF, Fourier methods) and a three-year specialization in Large Language Models across OpenAI, Anthropic, and open-source Llama-derived models. Designed and shipped production RAG, fine-tuned classifiers, and agentic chatbots.
- **Financial Risk Manager**, certified by the Global Association of Risk Professionals — advanced pricing, comprehensive risk metrics (VaR, credit/market/liquidity/operational), and portfolio performance evaluation.
- Certified **Risk and AI** expert with specialized training in AI governance, algorithmic impact assessment, and regulatory compliance for AI. Combines traditional risk-management expertise with AI knowledge to oversee algorithmic systems and their business implications.
- **AI control-systems design (capability)**: Designed an architecture that lets a remote AI agent execute commands on an operator's own machine **without** handing over a shell, and wrote the threat model that names its own weakest link — treating the LLM judge as a scope/coherence filter, never as the security boundary, with a deterministic policy gate that runs before and independent of any model. The design fails closed and separates the safety-critical execution path from the observability path. (Designed and specified; not deployed as a product.)
- Proven leadership **managing IT teams** for over a decade using Scrum/Agile, with deep SDLC focus on automation and continuous delivery.
- **Blockchain Developer**, graduated from the Polkadot Blockchain Academy in Berkeley, CA. Specializes in Rust, Substrate, and parachains; expert in cryptography, consensus algorithms, state machines, and blockchain fundamentals.

WORK EXPERIENCE

POSITIONING

Principal Engineer / Platform Architect in model risk and AI governance — most recently leading LLM system design and AI-risk oversight as a senior individual contributor and technical lead.

Senior Engineer / Technical Lead (LLM Systems & AI Risk)

Epoca International Inc. | Boca Raton, FL | 01/2023 - present

- Epoca International, Inc. is a US company that designs, manufactures, and distributes consumer products for the home and kitchen.
- **Social Media Analysis System**: Designed a system for gathering data from two major social media platforms, storing it in a PostgreSQL, and analyzing trends using ML/AI models for enhanced market insight capabilities.
- **AWS Infrastructure and Software Development Life Cycle**: Implemented and documented a robust AWS infrastructure and CI/CD pipeline, including Kubernetes, Docker, Ansible, GitHub Actions, Lambda, CloudWatch,

API Gateway, IAM, ECR. This infrastructure streamlines data management and optimizes team workflow.

- **Innovative AI Tools and Data Sandbox:** Integrated a fine-tuned model for social media hashtag analysis and established an AI data sandbox, enabling advanced data analysis and market trend prediction.
- **Data-Driven Market Trend Reports:** Regularly produced three types of insightful reports using the developed system: one on Amazon product trends and another on Amazon search term seasonality/trends. These reports, available through Custom GPT, inform product development and marketing strategies.
- **RAG System for AI Sandbox:** Developed a RAG (Retrieval-Augmented Generation) system in the AI sandbox for querying product data, integrating pgvector and FAISS vector databases with OpenAI embeddings and GPT-4 generated image descriptions, enriching product analysis capabilities.
- **AI Chatbot Development:** Created an AI chatbot with Next.js, RSC, React, Vercel AI SDK, Streaming, and Assistant API. The chatbot features multistep reasoning mechanics and external tools calling for RAG, enhancing user interaction.

Chief Executive Officer

Edge Apps LLP | Astana, Kazakhstan | 11/2020 - 05/2022

- Edge Apps LLP is a Kazakhstani IT company that implements projects on tracking consumer goods. **Establishment and Growth:** Founded a new IT systems development company and supervised a team of over 30 people. Grew revenue from zero to over 1 million USD in the first year. **Strategic Partnerships and Contracts:** Built strong relationships with partners and clients, resulting in 5 signed contracts, including Agile and Fixed price development for: National catalog of goods, Marking and traceability of goods, Ismet.kz marketplace for businesses, Fiscal data operator IS, Product development for labeling goods (Partnership and revenue sharing). **Legal and Financial Management:** Established legal frameworks with third-party subcontractors, including framework agreements, individual contracts, NDAs, and DD. Maintained the company's financial health and profitability above market level. **Leadership and Team Supervision:** Led a diverse team, ensuring project delivery and quality while fostering a collaborative and productive work environment.

Chief Executive Officer / CTO

Eurasia Blockchain Fintech Group Ltd. | Astana, Kazakhstan | 08/2018 - 07/2020

- Eurasia Blockchain Fintech Group Ltd. operates a digital currencies trading facility in Astana International Financial Center (AIFC) under common law. **Establishment and Licensing:** Obtained a financial license for operating a digital currencies trading facility in the AIFC jurisdiction under common law. Set up the company within the AIFC jurisdiction. **Corporate Governance and Compliance:** Created a comprehensive corpus of corporate governance documents to comply with AIFC financial regulations, including AML/CFT framework, client onboarding/KYC policies, IT governance, compliance framework, risk management framework, business continuity/disaster recovery plans, crypto custodial protocols, listing/delisting requirements, audit policy, IT governance policy, public offer, end-user/client agreements, and disclosure statements. **Technical Leadership and Operations:** Led a technical team of 3 full-time employees and a subcontract team of 5 to launch the exchange platform. Established customer service.

Founder / Lead developer

Process optimization LLP | Astana, Kazakhstan | 01/2017 - 07/2018

- **Data Analysis and Pipeline Development:** Utilized Pandas, Numpy, and MLP-based neural networks in SciKit Learn to analyze state vehicle registry data, with data pipelines for BI and analytics. Also conducted financial data analysis using LSTM in PyTorch. **Trading Bot Development:** Developed an automated trading bot in async Python and created a simulator for the bot in C++ to test various trading strategies at 1-minute and 30-minute intervals. **Industrial Process Modeling:** Built and optimized industrial process models using Java and AnyLogic simulation software, focusing on operational efficiency.

Head of laboratory of energy, ecology and climate

Nazarbayev University Research and Innovation System | Astana, Kazakhstan | 04/2012 - 12/2016

- The research arm of the Nazarbayev University in partnership with leading US and UK higher education and research institutions. I led a team in developing key models and strategic initiatives: **Energy System Modeling:** Developed an energy system model for Kazakhstan and Central Asian countries using the TIMES model generator from the International Energy Agency, focusing on energy and environmental analysis. **Power Grid and Renewable Energy Analysis:** Created a high voltage power grid and power generation model for Kazakhstan with GAMS, analyzing the development of renewable energy sources. **Regional Climate Strategy Modeling:** Employed the PRECIS toolkit for a Central Asian climate model, strategizing on climate change up to 2100. In collaboration with the World Bank, we formulated **GHG emission reduction policies for Kazakhstan's** Ministry of Energy. Managed a project with McKinsey & Co, culminating in a strategic state document on **transitioning to a Green Economy**, endorsed by the President of Kazakhstan in May 2013.

Researcher / Dev team leader

Institute of Thermophysics SB RAS | Novosibirsk, Russia | 06/2003 - 12/2011

- Leading institution in fundamental and applied scientific research in the areas of heat transfer and fluid dynamics. **PhD Thesis Defense:** Successfully defended my PhD thesis titled "Algorithms and Software for Optical Diagnostics of Two-Phase Flows," contributing significantly to the field. **Innovative Research and Development:** Created a new Planar Fluorescence Bubble Imaging technique, resulting in a highly cited publication (97th percentile). Developed a comprehensive set of algorithms for Particle Tracking Velocimetry in C++, involving image correlation analysis, object recognition, tomographic reconstruction, and noise reduction. **Software Development Leadership:** Managed the development of the "ActualFlow" software for Particle Imaging Velocimetry, leading a team of 7 developers. Designed the software architecture, encompassing the ActualFlow framework, 37 data processing algorithms, and 16 hardware control modules.

EDUCATION & CERTIFICATIONS

PhD in Computer Science and **MSc in Physics** from Novosibirsk State University, 2000 - 2011

Financial Risk Management 2022 and **Risk and AI 2025**, Global Association of Risk Professionals

Blockchain Developer, Polkadot Blockchain Academy from Parity tech and Web 3 Foundation, 2023

SKILLS

Languages: Expert in: C/C++, Python and JS/TS; proficient in Java and Rust.

LLM Techniques: RAG, Finetune, Embedding, Agents, Reasoning, AIGuard, Autogen.

Databases: Advanced in: PostgreSQL and SQLite; proficient in Redis, MS SQL

Large Language Models: OpenAI, Anthropic, Gemini, Open source (LLama 3 derived)

Chatbot Frameworks: Next.js, React, Vercel AI SDK, Streaming API, LangChain, LlamaIndex

DevOps: Docker, Git, Vim, Debian, AWS, Jenkins, Ansible, GitHub Actions

FINANCIAL RISK MANAGEMENT

The GARP FRM certification is a globally recognized standard for financial risk professionals (garp.org), covering: Identifying and managing various financial risks, including liquidity, credit, market, and operational risks; Understanding a wide range of financial products and investment vehicles, such as equities, fixed income, derivatives, real estate, and funds; Applying risk measurement techniques, including VaR metrics, simulation methods, correlation and copula analysis, and option Greeks; Evaluating portfolio performance using ratios like Sharpe, information ratio, and Jensen's

alpha; Pricing financial instruments using models such as Black-Scholes, binomial trees, and Monte Carlo simulation; Navigating financial platforms, including exchanges, OTC markets, and clearing houses.

RISK AND AI EXPERTISE

As a Certified Risk and AI Expert, my expertise encompasses the rapidly evolving intersection of artificial intelligence and risk management: Assessing AI system vulnerabilities and potential failure modes through specialized frameworks; Implementing governance structures for responsible AI deployment across organizations; Conducting AI impact assessments to identify, measure and mitigate algorithmic risks; Applying ethical frameworks to ensure AI systems operate fairly and transparently; Developing risk-aware AI models with appropriate safeguards against data drift and concept drift; Creating monitoring systems for ongoing assessment of deployed AI solutions; Advising on regulatory compliance with emerging AI legislation across global jurisdictions; Bridging technical AI implementation with strategic risk management for executive decision-making.

PERSONAL INFORMATION

- **Avid Traveler:** Explored over 20 countries and fluent in Russian, English, and Kazakh, with ongoing studies in Chinese.
- **Intellectual Pursuits:** Dedicated to studying mindfulness and deeply intrigued by concepts of time and consciousness.