Aharon Zbaida - Complete CV

Aharon Zbaida

Aharon Zbaida

Complete Curriculum Vitae

Email: roni762583@gmail.com | **Phone:** +1 (302) 648-2641 **LinkedIn:** linkedin.com/in/aharonzbaida | **GitHub:** github.com/roni762583 **Portfolio:** aharonzbaida.github.io | **Full Portfolio:** aharonzbaida.github.io/portfolio-full.html

---

Professional Summary

Multi-disciplinary engineer with 20+ years of experience building systems across machine learning, construction, materials science, and biomedical engineering. Demonstrated ability to lead technical projects from conception to deployment, manage large teams, and deliver complex systems in regulated environments. Experience spans production ML pipelines for financial data, large-scale construction project management (200+ workers, $2M+ budgets), chemistry lab operations, and medical device development.

Available for consulting, contract work, partnerships, and full-time opportunities in ML systems, construction technology, and technical project leadership—both in the US and internationally (Israel, Afric, Caribbean).

Core Competencies

Machine Learning & Software Engineering

- **ML Systems:** Production pipelines, reinforcement learning, time-series modeling, gradient boosting (XGBoost, LightGBM, CatBoost)
- **Evaluation:** Out-of-time validation, regime & cohort analysis, bootstrap methods, backtesting, statistical inference
- **Engineering:** Python, SQL, DuckDB, Docker, API development, data pipelines, experiment tracking
- **Domain:** Financial risk modeling, algorithmic trading, portfolio analysis, quantitative finance

Construction & Project Management

- **Project Leadership:** Teams of 200+ workers, subcontractor coordination, multi-phase scheduling
- **Budget Management:** $500K–$2M projects, cost estimation, procurement, financial controls
- **Technical:** Blueprint reading, structural systems, MEP integration, building codes, regulatory compliance
- **Specializations:** Residential construction, commercial renovations, design-build coordination

Materials Science & Chemistry

- **Lab Operations:** Chemical synthesis, analytical instrumentation (GC-MS, HPLC, spectroscopy), quality control
- **Applications:** Precision actuators, mechanical systems, aerospace and industrial materials
- **Documentation:** Technical reports, regulatory compliance, process optimization for manufacturing scale-up

Biomedical Engineering

- **Research:** Cardiac modeling, mathematical simulation, experimental validation
- **Technical:** Medical image processing, device development, FDA regulatory pathways
- **Publication:** Peer-reviewed research in cardiovascular biomechanics

---

Professional Experience

Independent ML Engineer / Researcher | Remote | 2020–Present

Focus on production ML systems for algorithmic trading and quantitative finance.

Key Projects: - **MuZero Trading Pipeline:** Designed reinforcement learning system processing 7,876 ticks/sec with <100ms latency and 60% memory reduction through optimized state representation - **FX Market Edge Prediction:** Conducted ML research on market predictability using hybrid TCNAE + LightGBM architecture (537K parameters, 224K samples across 24 instruments). Demonstrated rigorous out-of-time validation with honest reporting of null results (50.1% accuracy) - **Statistical Validation Framework:** Built bootstrap and permutation testing tools for time-series prediction in non-stationary financial environments - **Feature Engineering Service:** Created configuration-driven feature computation layer with versioning, point-in-time correctness guarantees, and support for historical replay and streaming data

Technologies: PyTorch, XGBoost, LightGBM, CatBoost, Python, Docker, Kafka, SQL, streaming data platforms

Founder & CTO | Peoples' FinTech LLC | Los Angeles, CA | 2017–2020

Led development of quantitative trading platform with integrated ML and event stream processing.

Responsibilities: - Built production trading infrastructure integrating ML models with event-driven architecture (Kafka/ksqlDB) - Developed expectancy calculator for strategy performance evaluation (Dr. Van Tharp framework) - Managed team of contract developers; responsible for technical architecture and product roadmap - Designed and implemented backtesting infrastructure with walk-forward validation - Created monitoring and alerting systems for live trading operations

Technologies: Python, Kafka, ksqlDB, machine learning, Docker, cloud infrastructure (AWS)

Business Impact: Platform enabled systematic trading across multiple asset classes with comprehensive risk management and performance tracking

Construction Project Manager | Various Locations | 2008–2020

Managed large-scale residential and commercial construction projects with full P&L responsibility.

Project Scope: - Multi-year residential development projects ($500K–$2M budgets) - Commercial renovations and tenant improvements - Team leadership: 200+ workers (carpenters, electricians, plumbers, masons, general laborers) - Subcontractor coordination across specialized trades - Quality control, safety compliance, regulatory approvals

Key Achievements: - Delivered projects on-time and on-budget with zero safety incidents - Managed complex scheduling across multiple concurrent phases (foundation, framing, MEP, finishing) - Negotiated and managed subcontractor relationships maintaining quality standards - Ensured compliance with building codes, permits, inspection requirements, and ADA standards - Developed standardized quality control processes adopted across multiple projects

Technical Skills: Blueprint reading, structural assessment, MEP systems integration, cost estimation, scheduling software, building code compliance

Programming Manager | Concord Wealth Management | Los Angeles, CA | 2007–2008

Led 8-person development team for financial services SaaS platform.

Responsibilities: - Managed development team and sprint planning - Oversaw platform migration and modernization - Implemented CI/CD pipelines and code quality standards - Coordinated with product team on feature development - Conducted code reviews and technical mentoring

Technologies: Web application development, database design, API integration, financial data systems

Project Engineer | Daren Labs Scientific | Israel | 2014–2016

Data analysis and modeling for R&D projects in materials science and chemistry.

Responsibilities: - Chemistry lab operations and quality control for aerospace and industrial applications - Material characterization and performance testing - Analytical instrumentation: GC-MS, HPLC, spectroscopy - Technical documentation for regulatory compliance - Process optimization for manufacturing scale-up - Development of precision actuators and mechanical systems

Specializations: Aerospace materials, industrial chemistry, quality assurance protocols, batch validation

Research & Algorithm Engineer | Anitani Solutions | 2003–2017

Algorithmic trading systems development and statistical modeling.

Projects: - **OANDA NEAT Algorithm:** Genetic algorithm-based trading system using neuroevolution (NEAT framework) - Statistical modeling for financial markets - Backtesting infrastructure development - Data pipeline development for market data processing - Risk management systems

Technologies: Python, genetic algorithms, neural networks, API integration, statistical analysis

---

Education

Bachelor of Science in Biomedical Engineering Rutgers University, New Brunswick, NJ | Graduated 2001

- **Senior Project:** Medical image processing library in Java
- **Research:** Mathematical modeling of cardiac muscle contractility
- **Coursework:** Systems physiology, biomechanics, signal processing, medical imaging, instrumentation

---

Publications

Zbaida, A., Rosenman, J., Hunter, W., Nikolic, S. "Series Elastic Fiber Damage in Stunned Myocardium." *American Journal of Hypertension*, v. 13, p. 51A, (2000).

Research Focus: Mathematical modeling of cardiac mechanics, specifically series elastic fiber damage in stunned myocardium. Developed computational models and conducted experimental validation using animal models.

Selected Projects & Open Source

Machine Learning & Software

FX Market Edge Prediction | GitHub Hybrid TCNAE + LightGBM research on forex market microstructure. 224K samples across 24 instruments with rigorous out-of-time validation.

OANDA NEAT Algorithm | GitHub Genetic algorithm-based trading system using neuroevolution. Integration with OANDA API for live trading.

Expectancy Calculator | Live Demo Trading strategy performance evaluation tool based on Dr. Van Tharp's framework. Monte Carlo simulation for drawdown estimation.

Bible Codes Analysis Tool Progressive Web App for equidistant letter sequence (ELS) analysis in biblical texts. Hebrew text processing with offline capabilities.

Habirokrator Israeli traffic violation consulting website with bilingual interface (Hebrew/English) and automated document generation.

Mathematical Visualizations

Interactive Demos: - Lissajous curves with real-time parameter adjustment - Epicycloid generation and animation - Canvas-based mathematical graphics

---

Technical Skills

Programming & Software

Languages: Python, Java, JavaScript, SQL, Bash **ML/Data:** PyTorch, XGBoost, LightGBM, CatBoost, scikit-learn, pandas, NumPy **Infrastructure:** Docker, Kafka, ksqlDB, Redis, PostgreSQL, TimescaleDB **Cloud & DevOps:** AWS, CI/CD, Git, experiment tracking, API development

Domain Expertise

Financial ML: Time-series modeling, backtesting, risk modeling, portfolio analysis, regime detection **Statistical Methods:** Bootstrap methods, permutation testing, Monte Carlo simulation, hypothesis testing **Algorithmic Trading:** Strategy development, execution systems, market microstructure, performance attribution

Construction & Engineering

Project Management: Scheduling, budgeting, procurement, quality control, safety compliance **Technical:** Blueprint reading, structural systems, MEP coordination, building codes, ADA compliance **Software:** CAD, project management software, estimation tools

Laboratory & Materials

Instrumentation: GC-MS, HPLC, spectroscopy, analytical chemistry equipment **Processes:** Chemical synthesis, material testing, quality assurance, batch validation **Documentation:** SOPs, regulatory submissions, technical reports

---

Languages

- **English:** Native
- **Hebrew:** Professional working proficiency

Professional Affiliations & Certifications

- Published research in peer-reviewed biomedical journal
- Experience with FDA regulatory pathways for medical devices
- Construction project management (practical experience across 12+ years)

Geographic Availability

Primary: United States (remote or on-site) **International:** Available for opportunities in Israel, Africa, and Caribbean regions **Travel:** Available for project-based travel and international consulting

---

References

Available upon request