

MARK D. JACKSON, B.S.E.E.

Expert Witness & Technical Consultant — Blockchain Protocols, Derivatives Market Design, Cryptographic Systems

Standing Cache Analysis • Fort Collins, Colorado

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SUMMARY OF QUALIFICATIONS

Blockchain protocol architect and named inventor on fourteen U.S. patents spanning derivatives market design and encryption/authentication for regulator-approved gaming systems. Thirty-four years of professional software and systems engineering experience, including fourteen years in cryptocurrency (since 2012) and eleven years of full-stack blockchain development (since 2015). Inventor of a patented short-term option trading system (U.S. 7,856,395; 8,229,840), later implemented as Microtick, a decentralized price oracle and options marketplace launched as a sovereign blockchain. Designed, built, and operated production systems across the full domain: consensus mechanisms and decentralized oracles, smart contracts on multiple platforms, cryptocurrency trading and arbitrage infrastructure, real-time derivatives matching engines, and embedded security systems approved by U.S. gaming regulators. Extensive experience working with patent counsel on claim drafting and prosecution, and with state gaming regulators on security approvals — accustomed to articulating complex technical systems precisely, in writing, for legal and regulatory audiences.

AREAS OF EXPERTISE FOR CONSULTATION AND OPINION

- Blockchain protocol architecture and consensus mechanisms (Cosmos SDK/Tendermint, Ethereum, Cardano, proof-of-stake systems)
- Decentralized oracles and price-feed mechanisms; oracle manipulation and market-manipulation analysis
- Mechanism design and token economics: incentive structures, Schelling-point consensus, game-theoretic protocol analysis
- Smart contracts: design, implementation, failure analysis, and source code review (Ethereum/Solidity-era, Cardano Plutus/Haskell, Aiken, Midnight/Compact)
- Options and derivatives market design; trading system architecture; order matching engines; market microstructure
- Cryptocurrency trading infrastructure: exchange connectivity, automated/arbitrage execution, custody and key management
- Cryptography as applied in production systems: encryption, authentication, digital signatures, hashing, tamper resistance
- Patent matters: claim construction support, infringement and invalidity analysis, prior art investigation, source code review (Go, TypeScript/JavaScript, Java, C/C++, Haskell, Python)
- Embedded and distributed Linux systems; IoT architecture; regulated gaming system security

PATENTS (14 U.S. PATENTS, NAMED INVENTOR, WITH GRANTED INTERNATIONAL COUNTERPARTS)

Derivatives market design — “Short-term option trading system” (assigned to Microtick LLC):

U.S. 7,856,395 • U.S. 8,229,840

Encryption, authentication, and secure gaming systems — primary inventor:

U.S. 7,988,559 • 7,867,084 • 7,783,040 • 7,618,317 • 7,470,182 • 7,203,841 • 7,179,170 • 7,116,782 • 7,043,641 • 6,962,530 • 6,935,946 • 6,866,581

Granted international counterparts and additional filings:

Canada 2,402,351 • South Africa 2002/07577 • additional published U.S. and international applications (including US 2003/0067112, sole inventor)

All U.S. patent terms have expired; listed as a record of invention history. Author or co-author of the underlying claims; worked directly with patent counsel through drafting and prosecution on each family, including continuation and continuation-in-part practice, PCT/international filings, and prosecution spanning assignee transitions (Shuffle Master → IGT).

PROFESSIONAL EXPERIENCE

Protocol Architect / Independent Researcher — Independent Research & Protocol Development, *Fort Collins, CO* 2024 - Present

- Designing a proprietary derivatives trading protocol: market mechanism design, protocol architecture, and full-stack implementation of the trading engine and supporting infrastructure.
- Architecting Microtick protocol version 3, adapting a Schelling-point price-discovery mechanism for adoption by traditional financial exchanges.
- Active Cardano ecosystem developer (2021-present): Emurgo-certified Cardano Developer Professional and Cardano Solutions Architect; hands-on work in Plutus/Plutarch (Haskell), off-chain tooling, Hydra L2 scaling, and Midnight smart contracts (Compact). Public work at github.com/cryptophonic.

Trading Infrastructure Architect — StormKing Trading, *Manhattan, NY* 2022 - 2024

- Designed, built, and deployed cryptocurrency trading infrastructure executing automated arbitrage across multiple exchanges; built real-time monitoring for trading activity, exchange connectivity, and blockchain node health.
- Partnered with quantitative strategy developers to deliver internal APIs matched to trading goals, latency requirements, and risk constraints.

R&D Team Lead — Microtick; Team Lead — Prism — ShapeShift, *Denver, CO* 2017 - 2021

- Created and led development of Microtick, a decentralized price oracle and short-term options marketplace implementing the patented market design (U.S. 7,856,395) on decentralized rails; first prototyped on Ethereum in 2015.
- Engineered a novel Schelling-point consensus mechanism using option premiums (rather than slashing) as the incentive structure, producing a consensus price stable under volatility and directly hedgeable by data consumers.
- Built the complete platform: Golang/Cosmos SDK application chain on Tendermint with React/Node.js trading interfaces; designed standardized short-term option markets (5-minute to 12-hour durations) and IBC-based token futures.
- Launched and operated a sovereign Cosmos blockchain with an independent validator set; authored the protocol whitepaper and technical documentation, and engaged directly with Cosmos ecosystem founders and core contributors on protocol design and adoption.

Senior Architect — Gogo Business Aviation, *Broomfield, CO* 2012 - 2016

- Enterprise Architect for the Connected Aircraft (IoT) initiative; re-architected the AMP messaging protocol; chaired the company-wide System Steering Committee, reporting to executive staff.

Principal Engineer / Lead Engineer — Triple Play Integration / CalSoft Labs, *Boston, MA* (remote) 2009 - 2012

- Ported Adobe Flash and Android OS to embedded set-top boxes and mobile devices across diverse embedded Linux environments; coordinated distributed engineering teams for external customers.

Co-Founder / Principal / Software Architect — Precision Technologies, *Fort Collins, CO*
2003 – 2009

- Co-founded and led a software consultancy delivering Linux- and Java-based client solutions; primary technical relationship manager for client engagements.
- Invented and patented (2004) the Microtick short-term option trading system and built its first implementation: a real-time derivatives matching engine (MySQL, Java servlets, Java SWT client).
- Built a web-based embedded biometric fingerprint two-factor authentication system (Pay-by-Touch) and the Aeon Linux platform with real-time cryptographic hashing for software component validation.

Manager — Advanced Development / Slots — Shuffle Master Gaming, *Fort Collins, CO*
2000 – 2003

- Designed the Linux-based embedded operating system, security infrastructure, and API powering real-time video slot machines for flagship product lines.
- Invented the encryption and authentication mechanisms that won regulatory approval for video slots across multiple U.S. gaming jurisdictions (twelve patents as primary inventor); liaised directly with patent attorneys and state gaming regulators.

Technical Consultant / Systems Architect — BME LLC (contracted) 1992 – 2000

- Distributed and embedded application design and systems integration across multiple client engagements.

EDUCATION & PROFESSIONAL CERTIFICATIONS

- B.S., Electrical Engineering — Colorado State University, Fort Collins, CO
- Emurgo Academy — Cardano Developer Professional
- Emurgo Academy — Cardano Solutions Architect

SELECTED PUBLICATIONS, TECHNICAL WRITING & PRESENTATIONS

- Microtick protocol whitepaper and technical documentation (author), 2015–2020 — decentralized price discovery via Schelling-point option markets; evolved across protocol generations from the 2015 Ethereum prototype through the Cosmos mainnet launch. Available via github.com/cryptophonic.
- Open-source protocol implementations and technical writing: github.com/cryptophonic
- Fourteen issued U.S. patents with granted international counterparts and additional published applications (see Patents, above), each including detailed technical specifications authored with patent counsel.

PRIOR TESTIMONY

No prior deposition or trial testimony. Available for consulting-expert and testifying-expert engagements.