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John H. Ring IV, PhD

Full-Stack Data Science Leader

Principal Data Scientist leading data science across Cybersecurity & Enterprise Technology at MassMutual. Built the company's foundational in-house ML for threat and fraud detection, outperforming commercial tooling. Now lead its move to agentic AI – defending the enterprise at machine speed and driving AI adoption across security operations and the SDLC. PhD computer scientist who takes greenfield data science from ideation to production, embedded in existing workflows and modernized when needed, avoiding the failure mode most AI projects fall into by recognizing it's people and process, more than tools, that drive impact.

Experience

March 2021 – Present

Data Science - Cybersecurity & Enterprise Technology, *MassMutual*, Remote
Principal Data Scientist (November 2025 – Present)
Lead Data Scientist (March 2021 – November 2025)

- Created CATCH (Cyber Anomaly Threat Capture Heuristics)
  - To-date CATCH is involved in ~40% of detected true positives and is often the first or sole indicator of compromise
  - Became primary User and Entity Behavior Analytics tool at MM, exceeding vendor capabilities while saving $1.2M/year
  - Addresses key coverage gaps across the ATT&K Framework and audit mitigations
- Lead SPARTA (Security Posture, Assessment, Remediation, Triage & Analysis) – MM's program to defend the enterprise at machine speed against AI-driven attacks
  - Fuses holistic signal ingestion into data-driven classification of asset risk, importance, exposure, and vulnerability
  - Fully agentic AI zero-day discovery, surfacing code and configuration flaws that conventional SAST and cloud-security scanners miss
  - Autonomous patch pipeline: test, verify, deploy, and roll back
- Lead the Agentic SOC initiative, replacing analysts' repetitive manual lookups with agentic flows that gather and summarize relevant context – improving triage consistency and velocity today, with automated false-positive closure next
- Led creation of FLAG (Fraud Anomaly Leads Generator)
- Built and lead the Cybersecurity & Fraud data science domain — its portfolio and roadmap; offered the permanent leadership role but declined to relocate
- AI Lead for enterprise SDLC modernization and MassMutual's GenAI Guild: drove the Claude Code rollout (training program, inner-source plugin repo, platform connectors, modernized SDLC standards) and LLM/agentic adoption
- Solution Architect for MassMutual's in-house AI reference architecture; advise enterprise cloud and AI strategy and set MLOps and security standards

June 2017 – February 2021 **Modeling & Simulation Department**, *MITRE*, Burlington, VT
Computational Finance Engineer (May 2020 – February 2021)
Computer Science Graduate Fellow (June 2017 – May 2020)

- Develop metrics and software to quantify effects of geographic fragmentation on U.S. equities markets by analyzing petabytes of high-frequency financial data
- Authored empirical studies of U.S. equities market microstructure which led to creation of a new DARPA program and $2.6M SEC contract award to MITRE
- Met with SEC Commissioner and advisors to discuss key research findings

2013 – 2017 **Software Engineering Intern**, *Lord MicroStrain Sensing Systems*, Burlington, VT
Embedded systems firmware development for WSDA product line

Education

2018 – 2021 **Ph.D. Computer Science** , *University of Vermont*, Burlington, VT

- Fully funded by UVM Center for Computer Security and Privacy
- Co-founder of UVM – MITRE Computational Finance Laboratory
- Qualifying exams: Algorithms, Machine Learning, Differential Privacy, Compilers
- Thesis: Establishing behavioral baselines for computational systems: two case studies
- Research featured in Wall Street Journal: "Brief Price Gaps in Stocks Cost Investors $2 Billion a Year" (Feb 2019)

2016 – 2018 **M.S. Computer Science** , *University of Vermont*, Burlington, VT

- Fully funded graduate teaching fellowship; co-taught programming languages, and modeling complex systems

2012 – 2015 **B.S. Computer Science**, *University of Vermont*, Burlington, VT

Academic Publications

2022 **Efficient differentially private secure aggregation for federated learning**. USENIX Security
2022 **Ecological and coevolutionary dynamics in modern markets yield nonstationarity in market efficiencies**. Complexity
2021 **Methods for host-based intrusion detection with deep learning** (lead). Digital Threats
2020 **Fragmentation and inefficiencies in US equity markets**. PLoS ONE
2020 **Connected graphs with a given degree sequence** (lead). NetSci
2019 **Proof-carrying network code**. ACM CCS

Patent

2025 **System and method of identifying malicious activity in a network**. US Patent 12,483,574 B1

Notable Side Projects

Not Completely C — a C compiler written in Rust that emits x86-64 machine code directly (full lexer-through-codegen pipeline, no external assembler)

G.O.T. Flashes — web app for the International Lightning Class sailing community to log days and track awards; 108 users (Laravel, Livewire)

Technical blog — experiments and write-ups on agentic AI, compilers, systems, security, and self-hosted infrastructure

Technical Summary

Domain Expertise: Cybersecurity & threat detection | Fraud detection & prevention | User and entity behavior analytics (UEBA) | Financial market microstructure

Generative & Agentic AI: Agentic & multi-agent systems | LLM application development (RAG, tool use) | LLM evaluation & benchmarking (LLM-as-judge) | Local/open-weight inference & quantization (llama.cpp, Ollama) | Agentic coding (Claude Code)

ML & Analytics: Real-time streaming analytics | Production anomaly-detection & fraud ML | Deep learning for security | Model deployment & monitoring at scale

Engineering & Infrastructure: Python (NumPy, SciPy, Pandas, Polars) | Rust | AWS Cloud Architecture | Docker | Kafka | Enterprise MLOps | PostgreSQL | DuckDB | vector stores | SIEM (SumoLogic) | Linux

Leadership & Strategy: Team building & mentorship | Enterprise AI/ML adoption | Roadmap & vendor strategy | Aligning data science to business outcomes

Interests

Competitive sailing — race in the International Lightning Class World & North American Championships | Woodworking | Photography