Mohamed El Khoudimi

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Software, AI and quantitative systems engineering: production automation and evaluated AI at BMO, with solo C++ market-data engineering and collaborative execution research.

SELECTED EXPERIENCE

BMO Financial Group

AI & Software Engineer Co-op | Database Reliability | September-December 2026 | Toronto

Built a read-only AI incident-triage service used by approximately 30 engineers, reducing median initial diagnosis from 28 to 15 minutes (46%) across 240 incidents evaluated in the pilot. Operational actions require human approval.

Developed a roughly 250-case evaluation suite: output quality rose from 70% to 87%, with 94% evidence-supported outputs. Delivered four solutions, saving an estimated 900 hours annually. Shipped production automation and deployed a containerized service with operational health checks.

AstraSage Consulting

Founder & Strategic Analyst | January 2023-present

- Scoped and delivered client workflows for research, document generation and intelligent processing, integrating APIs, prompt orchestration and iterative output evaluation.

- Owned implementation, documentation and client delivery alongside financial modeling, dashboards and analytical reporting.

NTT Corporation

Fraud Analyst & Financial Reporting Analyst | May 2022-September 2024

- Investigated 200+ financial and fraud cases and documented findings for escalation under service-level and compliance requirements.

- Automated recurring reporting with Python and standardized validation. Reported outcomes include approximately 60% less manual reporting effort and 35% improved cross-team handover efficiency.

SELECTED SYSTEMS & RESEARCH

ASTER Market Engine

C++20 historical Nasdaq ITCH replay with full-depth displayed order-book reconstruction, price-time FIFO queues, snapshots and session audits.

Documented session: 368,366,634 input frames. Separate Python comparisons cover a 20-million-frame prefix and selected late-session snapshots; they do not independently verify every state in the full replay.

Source & documentation | Measurements, method & limitations

Quantitative Strategy Engine

Co-built with Marcus Myrick a C++ event-driven execution-research engine with full-depth order books, FIFO queues, queue-aware fills, an arena allocator and an SPSC ring buffer. Led cross-platform determinism testing. Source code remains private.

Research validation includes CPCV and Deflated Sharpe, with negative strategy results retained. Paper-trading integration; no claim of profitable live deployment.

Agentic Markets

Built a research environment separating agent-reported performance from independently calculated trading P&L, with a four-rung condition ladder and bootstrap analysis. Validated the analysis pipeline on a deterministic mock provider; a separate committed episode records agreement between reported and independently calculated P&L.

Event-Driven Fraud Engine / AACP

Built a fraud arbitration control plane with event ingestion, dynamic threshold control, agent orchestration and human escalation. The project record reports approximately 395 requests/second sustained throughput in k6 load testing.

Market microstructure research

Avellaneda-Stoikov order-queue audit - replicated three published tables, built a queue-aware simulator and validated 2,110,860 exchange messages. Held-out economic evaluation remains pending.

Kyle's lambda - pre-registered research over 351 million raw trades. Forecastability held on four holdout pairs; the execution-benefit criterion did not pass. Preserved corrected and as-run scorecards.

EDUCATION & TOOLS

Computer Programming Diploma, Georgian College | January 2025-April 2027 (expected) | GPA 3.7/4.0

Bachelor of Engineering (B.Eng.), Mechanical Engineering, Université de Moncton | August 2020-May 2024 | GPA 3.4/4.0 | conferred 2024 | taught in French

C++ | Python | SQL | FastAPI | Pydantic | pandas / NumPy | Git | Docker | CMake | GoogleTest | pytest

English | French | Arabic