# Neel Upadhyay

647-224-2484 • neelmu12@gmail.com • LinkedIn • GitHub • Brampton, Ontario

## SUMMARY

Software Engineering student (Cybersecurity Stream) at York University with hands-on experience building backend systems, REST APIs, and cloud infrastructure. Delivered end-to-end systems in Java, Python, and AWS — from real-time data pipelines and microservices platforms to cryptographic protocols. Strong foundations in database design, cloud deployment, and software reliability.

## TECHNICAL SKILLS

**Languages:** Java, Python, C/C++, SQL, JavaScript / TypeScript
**Backend & APIs:** REST APIs, WebSockets, Spring Boot, JDBC, microservices, JWT auth, real-time pipelines
**Cloud & DevOps:** AWS (EC2, S3), Docker, Linux / Unix, Bash scripting, WSL, Git
**Frontend & DB:** React, HTML/CSS, SQL schema design, query optimization
**Certifications:** Google Cybersecurity Certificate (2025), CompTIA Security+ (2026), AWS Cloud Practitioner (2026), Java HackerRank Certificate (2024), Blue Team Level 1 (2026)

## WORK EXPERIENCE

**TJX Companies** — Mississauga, ON *Sept 2024 – Dec 2024*
**Real Estate Market Analyst Co-op**

- Automated reporting workflows with Python scripting, improving data accuracy by 15% and reducing manual analyst effort.
- Analyzed market data (population growth, competitor activity, demographics) to support trade area expansion decisions.
- Built Excel dashboards tracking store performance to inform retention and relocation strategies.

**Manefa Contracting Inc.** — Brampton, ON *June 2021 – Aug 2022*
**Software Developer Intern**

- Built a Java + SQL application to automate material cost tracking, cutting manual entry errors by 60% and improving data integrity.
- Developed real-time Excel dashboards for project tracking, increasing operational efficiency by 30%.
- Designed a modular reporting system enabling project managers to query cost and progress data across multiple active contracts simultaneously.

## PROJECTS

**Real-Time ANPR & Parking Lot Monitoring System** *| Python, AWS EC2, WebSockets, REST API, SQL, React* *2025 – 2026*

- Built a live vehicle monitoring system that detects license plates at the edge and streams results to AWS with sub-second latency — processing and displaying data in real time via WebSocket.
- Designed the AWS EC2 backend with WebSocket support to receive structured JSON payloads (plate data, timestamps, confidence scores) from a Jetson Nano edge device at low latency.
- Built a Python REST API with a normalized SQL schema to log detections, support historical queries, and serve analytics across the pipeline.
- Developed a React dashboard for security staff to monitor live vehicle entries and query detection history with real-time updates.

**Auction e-Commerce Platform — Microservices** *| Spring Boot, Java, MySQL, Docker, JWT, React* *2025 – 2026*

- Built a microservices platform with 6 Spring Boot services (User, Catalogue, Auction, Payment, AI, API Gateway), each with an isolated MySQL schema, orchestrated via Docker Compose.
- Built an HTTPS API Gateway with JWT validation, route protection, and header sanitization — the single entry point for all external traffic across services.
- Secured write operations (payments, bidding, AI) behind JWT auth while keeping read endpoints public; validated with a full Postman test suite.
- Integrated an AI auction assistant backed by Gemini and Tavily web search, served through the gateway with a React frontend.

**Double Ratchet Secure Messaging Protocol** *| Python, Diffie-Hellman, KDF Chains, AES* *2025 – 2026*

- Implemented Signal's Double Ratchet protocol over email — combining DH ratchet exchange with symmetric KDF chains to generate a unique encryption key per message.
- Enforced forward secrecy and break-in recovery: past messages stay secure after key compromise, and future messages self-heal after each ratchet step.

**AES-128 Hardware Encryption — FPGA** *| Verilog, DE10-Lite FPGA* *2025 – 2026*

- Implemented AES-128 encryption/decryption in Verilog at the register-transfer level, including SubBytes, ShiftRows, MixColumns, and AddRoundKey across all cipher rounds.
- Built modular components: ALU, key-expansion module, RAM storage, and FSM controller with switch-based I/O for plaintext input, key generation, and RAM addressing.

## EDUCATION

**Lassonde School of Engineering** — York University *Sept 2022 – Dec 2026*
Honours Bachelor of Engineering, Software Engineering | Cybersecurity Stream