Massimo Caruso

(514) 944-5977 | massimo02caruso@gmail.com | linkedin.com/in/massimocaruso | github.com/Extinctable

Hiring manager
COMPANY
STREETNUMBER STREETNAME, CITY, PROVINCE POSTALCODE

June 1, 2025

Dear Hiring manager,

I am thrilled to apply for the POSITION role at COMPANY. As a third year Software Engineering student at Concordia University, I bring a robust foundation in software development, coupled with hands-on experience from academic and professional projects.

As a challenge designer with the Hexploit Alliance at AtHackCTF, I designed a security challenge simulating an access control system using MIFARE Classic cards, focusing on vulnerabilities like weak key management and privilege escalation. Participants reverse-engineered RFID memory sectors and forged admin access, gaining hands-on experience with embedded systems security.

In the AtHackCTF 2025 organizing team, I prepared over 600 MIFARE Classic cards, handling custom data writing and proper labeling. I also managed the distribution of RFID card readers and facilitated a lockpicking activity during the event.

In addition, my academic projects, such as creating an online Food Database System and a Teacher-Student Feedback Web Application, allowed me to refine my expertise in Python, JavaScript, and SQL while working with APIs and relational databases. These projects taught me to manage end-to-end software development, optimize system performance, and focus on user-centered design.

What excites me most about COMPANY is COMPANYDETAILS. I am particularly drawn to the opportunity to POSITIONDETAILS.

I am confident that my technical skills, academic achievements, and passion for software engineering make me a strong candidate for the POSITION role. I would welcome the opportunity to discuss how my experiences align with the needs of your team. Please feel free to reach out to me at (514) 944-5977 or massimo02caruso@gmail.com.

Thank you for considering my application. I look forward to the possibility of contributing to COMPANY's success.

Sincerely,
Massimo Caruso

Massimo Caruso

(514) 944-5977 | massimo02caruso@gmail.com | linkedin.com/in/massimocaruso | github.com/Extinctable

Education

Montreal, Canada **Concordia University** **Jan 2023 – Present**

- **Major:** Software Engineering, BEng
- **Relevant Courses:** Data Structures and Algorithms, Operating Systems, System Hardware, OOP, Databases, Probability and Statistics

Experience

PayFacto - Payment Technology Solutions **May 2025 – August 2025**

Software Project Manager, Intern

- Spearheaded data acquisition, cleaning, and preprocessing of raw merchant data sets for the deployment of MEVWeb, a province-wide cloud-based SaaS platform mandated by Revenu Québec.
- Participated in end-to-end deployment of MEVWeb software both remotely and on-site, including planning, testing, and installation across restaurant partners.
- Led and supported physical hardware transitions by uninstalling legacy MEV devices and installing MEVWeb-compatible components such as printers and routers.
- Collaborated with project delivery, field services, and sales teams to ensure seamless coordination of deployments and merchant onboarding.
- Tested MEVWeb software builds and deployment packages, reporting bugs and verifying stability before production rollout.

AtHackCTF **Nov 2024 – March 2025**

Challenge Designer and Developer, Permanent Part-time

- Designed a complex RFID-based Capture the Flag (CTF) challenge using a real ATM machine and MIFARE Classic cards, which communicated with the machine's reader to simulate a security environment.
- Developed three flags requiring participants to:
  - Extract the card's PIN from memory by reverse-engineering the RFID data.
  - Manipulate the card's balance data, allowing the participant to alter the funds stored on the card.
  - Modify the card's UID to impersonate an admin and escalate privileges within the system.
- Implemented an interactive ATM interface, including buttons for navigation and a printer to issue flags upon successful completion of challenges.
- Facilitated the learning of hardware security, from memory manipulation to privilege escalation, within a real-world context.
- Prepared over 600 MIFARE Classic cards by writing custom data to each card and ensuring proper labeling and formatting for participant use.

Projects

Food Database System

- Developed an online nutritional database integrating structured data from two APIs (FatSecret and TheMealDB) to provide detailed nutritional information, recipes, and dietary metadata.
- Scraped, cleaned, and validated JSON data from APIs using Python scripts, addressing null and duplicate values. Data was stored in relational (PostgreSQL) and non-relational (MongoDB) databases to leverage hybrid data management.
- Designed an ER model with 15 interconnected tables for PostgreSQL and collections for MongoDB ("recipes," "directions," and "foods"). Optimized queries for both SQL and NoSQL, including indexing and aggregate operations to enhance performance.
- Automated migration of structured data from PostgreSQL to MongoDB using Python scripts, ensuring seamless linkage of primary and foreign keys during the process.
- Resolved inefficiencies in FatSecret API data retrieval by implementing a random recipe name generator to bypass large ID gaps, significantly improving data extraction speed and accuracy.

Teacher-Student Feedback Web Application

- Designed and implemented responsive frontend components, including an interactive sidebar, header, and landing page, ensuring smooth navigation and adaptability across devices.
- Developed and connected the frontend for the feedback and contact pages to backend APIs, allowing users to view feedback and submit messages with real-time confirmations.
- Designed and hosted relational databases on Microsoft Azure, optimizing SQL queries for efficient data retrieval and manipulation.
- Conducted acceptance tests, resolved bugs, and ensured feature functionality for a seamless user experience across various devices.
- Managed the repository with version control, reviewed pull requests, implemented coding standards, and documented processes to ensure project quality and organization.

Linear Regression Model

- Developed a multiple linear regression model to analyze factors influencing life expectancy using WHO data from 193 countries (2000–2015).
- Cleaned and preprocessed data by managing missing values, removing outliers, and converting categorical variables into quantitative data using Python.
- Applied backward elimination to reduce predictors from 20 to 6, addressing multicollinearity and improving model accuracy (adjusted $R^2 = 0.771$).
- Used Python (Pandas, NumPy, Scikit-learn) for analysis, hypothesis testing, and modeling; visualized correlations using heatmaps and scatter plots.
- Predicted 2013 Canada life expectancy within 0.5 years of WHO's reported value, demonstrating model reliability and efficiency.

Skills

Languages: (Proficient): C, Java, LaTeX, HTML/CSS, Javascript, Python, SQL; (Familiar): C++, Clojure, Erlang
Frameworks: React, Node.js, Flask, Express.js
Libraries: Pandas, NumPy, Matplotlib, Scikit-learn
Developer Tools: Git, Docker, MongoDB, PostgreSQL, Neo4j, VS Code, Eclipse, Jupyter Notebook
Methodologies: Agile development, Scrum, Waterfall