Massimo Caruso

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

Hiring Manager

March 11, 2025

Dear Hiring Manager,

I am writing to express my interest in a Software Engineering Intern position at your company. As a third-year Software Engineering student at Concordia University, I am eager to apply my knowledge and technical expertise in a professional setting. I am seeking a four-month, paid internship starting May 5th and ending at the end of August. I am confident that my background in software development, problem-solving, and collaborative teamwork would allow me to make meaningful contributions to your team.

Through both academic and personal projects, I have gained hands-on experience in software development, system optimization, and full-stack engineering. I have worked extensively with Java, Python, JavaScript, and SQL applying these languages to build interactive web applications, optimize database performance, and develop efficient algorithms. My experience in React, Node.js, Flask, and Express.js has allowed me to create dynamic front-end interfaces and scalable back-end architectures. Additionally, I have designed and maintained relational and non-relational databases using PostgreSQL, MongoDB, and Neo4j, ensuring data integrity and performance optimization. My familiarity with Docker, Git, and Agile methodologies has further strengthened my ability to collaborate effectively in development teams and contribute to iterative software improvements.

In addition to coursework, my role as a CTF Challenge Designer at AtHackCTF has given me experience in cybersecurity, system analysis, and hardware/software integration. I designed RFID-based Capture the Flag challenges to simulate real-world security scenarios, which deepened my understanding of network protocols and secure system architecture. My academic projects, including a Food Database System and a Teacher-Student Feedback Web Application, have refined my ability to work with APIs, cloud services, and user-centered design principles to build high-quality, maintainable software.

I am fluent in both English and French and have strong communication skills, allowing me to collaborate effectively in diverse teams. My ability to analyze complex problems, design scalable solutions, and adapt to new technologies has been reinforced through both academic and hands-on experience. I thrive in fast-paced, innovation-driven environments where I can apply my software engineering skills to develop secure, efficient, and maintainable solutions.

I am eager to bring my passion for software engineering and skills in software development, data structures, and system architecture to your company, where I can contribute to innovative projects while continuing to grow as an engineer. 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 your time and consideration. I look forward to the possibility of contributing to your company's success.

Sincerely,

Massimo Caruso

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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

CTF Challenge Designer, **AtHackCTF** **Nov 2024 – Present**

Hackathon (www.athackctf.com): Capture the flag based hackathon.

- Designed and implemented RFID-based Capture the Flag (CTF) challenges that simulate real-world security scenarios, providing participants with engaging and educational problem-solving experiences.
- Created challenges involving RFID technologies, leveraging knowledge of protocols, hardware (e.g., RFID readers and tags), and software tools to develop realistic attack and defense simulations.
- Focused on balancing difficulty and educational value, ensuring participants gain practical skills in RFID security, including vulnerability identification and exploitation.

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): Java, LaTeX, HTML/CSS, Javascript, Python, SQL; (Familiar): C, 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