GiuseppeCalderonio

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Education

University of Illinois at Chicago Jan 2022 - Dec 2023
Master in Computer Science, (Double Degree), *GPA*: 4.0/4.0.

Politecnico di Milano Sep 2021 - Dec 2023
Master in Computer Science, (Double Degree), *Avg.*: 29.05/30.

Politecnico di Milano Sep 2018 - Sep 2021
Bachelor in Computer Engineering, *Avg.*: 26.05/30.

Skills

Java, C, Python, Scala, Javascript, TypeScript, HTML, SQL, MySQL, SQLite, Supabase, VHDL, Chisel, Android, React, Puppeteer, Selenium, Node.JS, Git, GitHub, Docker, AWS, J2EE, Hadoop, BurpSuite, SQLMap, OOP, UML, AWS S3, AWS EMR, AWS Lambda

Master Thesis

Privacy Analysis on Protected Audience API Jan 2023 - Dec 2023

- Disclosed 12 different Chromium privacy issues in the Google's Protected Audience API, currently in the process of being fixed. Actively collaborated with the dedicated developer team to elucidate the reported issues through the Chromium portal. Vulnerabilities reported include tracking vectors, DOS, cross-site leakage attacks and crashes.
- Scraped with puppeteer the first 70,000 websites from the tranco dataset to check percentage API usage on a monthly basis. Created custom Python-based ETL pipeline to efficiently analyze 1,608 GB of raw scraped data and produce report in JSON and csv format.

Experience

Graduate Assistant Jan 2023 - May 2023
University of Illinois at Chicago

- Procured a Dell server for hosting a web page, perform daily data analysis tasks, and database management. Collaborated with the advisor to best fit needs in terms of computational power, storage capacity, reliability and security. Negotiated with suppliers for best price and delivery terms saving 50% of the initial 5000 $ budget constraint.
- Ubuntu Server 22.04 selected as underlying OS to support the system. Simulated the environment prior to server shipping with a virtual machine running the Ubuntu operating system.
- Prototyped a React web page and MySQL Database intended to be hosted on the final server.

Projects

Image Classification Web Page (Available here) Oct 2022 - Dec 2022
Secure Web Applications Project, University of Illinois at Chicago

- Realized a React-based web page for image classification and rating, following the JamStack framework.
- Front end developed with React allowing image upload and rating, deployed with Netlify to satisfy the 3 core web vitals. Backend implemented with Supabase, creating relational tables for general purpose operations on image metadata, alongside object buckets for efficient read on image content. Microservice incorporated with Supabase edge function and appropriate row level policies specified for security.
- Google Vision third-party API features image filtering and classification.

OWASP Juice Shop Nov 2022 - Dec 2022
Secure Web Applications CTF, University of Illinois at Chicago

- Successfully penetrated the OWASP Juice Shop during the Secure Web Application CTF competition. Demonstrated advanced skills in ethical hacking, vulnerability analysis, and penetration testing.
- Achieved proficiency by completing approximately 40 challenges out of a diverse range offered by Juice Shop. Developed expertise in identifying and exploiting security flaws from OWASP top ten such as XSS, SQL Injection, security misconfigurations and more.
- Utilized sophisticated hacking tools, including BurpSuite, SQLMap, and Nmap, to facilitate the penetration testing process. Applied these tools effectively to discover and exploit vulnerabilities, showcasing technical expertise in cybersecurity tools and methodologies.

Timestamp Search Microservice (Available here) Oct 2022 - Nov 2022
Cloud Computing Project, University of Illinois at Chicago

- Developed a high-performance Scala microservice for efficient log message retrieval within specific time intervals, showcasing expertise in cloud-based architecture and distributed systems.
- Implemented automated log file generation from an AWS EC2 Ubuntu instance, demonstrating proficiency in cloud infrastructure management and data processing. Utilized AWS S3 for secure storage of log files, emphasizing data integrity and confidentiality in cloud-based solutions.
- Designed the microservice using a binary search algorithm, ensuring rapid and accurate searches. Deployed the microservice as an AWS Lambda instance, optimizing throughput and resource utilization. Simulated gRPC clients for seamless communication, employing HTTP protocols to transmit gRPC messages, showcasing adeptness in inter-service communication and API integration.

Distributed Map Reducer (Available here) Sep 2022 - Oct 2022

Cloud Computing Project, University of Illinois at Chicago

- Realized a Scala-based distributed Map Reduce model for log files analysis of length up to 10 GB. A total of 4 different jobs written, tested and well documented in Scala programming language.
- Jar file deployed on AWS Elastic Map Reduce to support high workloads, inputs and outputs provided as files on AWS S3 Bucket.

Hacking CTF May 2022 - Jun 2022

Computer Security CTF, Politecnico di Milano

- Successfully tackled complex web and binary CTF challenges, demonstrating expertise in cybersecurity concepts and practical exploitation techniques.
- Expertly exploited common binary security vulnerabilities, including Buffer Overflow and Format String, showcasing advanced skills in debugging and analyzing stack contents using GDB. Additionally, reverse-engineered a compiled assembly file to extract password information, highlighting proficiency in low-level programming understanding.
- Mastered the art of exploiting prevalent web security vulnerabilities such as XSS, SQL Injection, and CRSF. Conducted in-depth HTTP analysis using BurpSuite and executed attacks using SQLMap, showcasing deep knowledge in web application security.

Torus Hardware Accelerator (Available here) Mar 2022 - Jun 2022

Computer Architectures II Project, Politecnico di Milano

- Hardware accelerator designed in Chisel featuring a Torus topology optimized for parallel data exchange.
- Topology supports a configurable number of dimensions, ranging from 1 to 5. Each processing element incorporates a number of memories linear to the dimension chosen, facilitating parallel data communication among adjacent components in a single clock cycle.
- Programmed in Scala, benchmarked up to 36 processing elements, reaching 239.99 Bytes/clock throughput with an aggregated bandwidth of 576 Bytes.

Phone Subscriptions Web Application (Available here) Oct 2021 - Dec 2021

Databases II Project, Politecnico di Milano

- Developed a robust Apache Tomcat J2EE based CRUD web application for efficient management of phone subscriptions, showcasing advanced proficiency in Java programming and web technologies.
- Engineered a high-performance MySQL Database optimized for lightning-fast data retrieval, leveraging advanced query mechanisms, triggers for data consistency, and optimized views. Deployed the database on AWS utilizing Amazon RDS for scalability and reliability.
- Demonstrated expertise in integrating the back-end logic using Java Persistence API (JPA) Object-Relational Mapping (ORM), ensuring smooth data flow and system stability.

Multiplayer Board Game (Available here) Jan 2021 - May 2021

Bachelor Project, Politecnico di Milano

- Online multiplayer board game in Java, engineered to support matches with 1 to 4 players in accordance with the MVC framework.
- Model designed incorporating multiple design patterns, tested with more than 400 tests reaching 99% of code coverage. Network developed with low level sockets and basic java synchronization mechanisms, allowing multiple concurrent games. Server code deployed on AWS in an Ubuntu EC2 instance, Client supports both GUI and CLI.

Image Equalizer Dec 2020 - Feb 2021

Logic Design Project, Politecnico di Milano

- Designed an image equalizer

Command Line Text Editor Jun 2020 - Sep 2020

Data Structures and Algorithms Project, Politecnico di Milano

- Command line text editor in C supporting the following 5 instructions : read, write, delete, undo, redo.
- Algorithm implemented using a C array, exhibiting linear time and space complexity with respect to the array length for each operation in the worst-case scenario.
- Tested over a private test case suite with Time and Space complexity constraints.