Luca Volonterio

Brussels, Belgium volonterioluca@gmail.com Luca Volonterio L1uk Portfolio

Professional Summary

Cybersecurity researcher specializing in AI-driven threat detection and secure system design. Proven track record of developing innovative security solutions with 99% accuracy in threat detection using Graph Neural Networks. Expert in low-level security programming, cryptographic implementations, and vulnerability assessment. Combines advanced technical research capabilities with cross-cultural collaboration skills gained through international academic and professional experiences across Europe.

Seeking a six-month cybersecurity internship beginning February 2026 in security research, product security, or security-by-design to advance cutting-edge threat detection technologies and contribute to next-generation security architecture development.

Education

Université Libre de Bruxelles (ULB) Brussels, Belgium
CYBERUS Master in Cybersecurity Sept 2025 – Feb 2026

- **Advanced Security Research:** Mobile and Wireless Network Security, Embedded System Security, Digital Forensics and Reverse Engineering, Cryptanalysis (INFO-F-537), Machine Learning Security
- **Research Focus:** Developing novel approaches to IoT security assessment, advanced cryptographic attack methodologies, and AI vulnerability analysis
- **Technical Expertise:** Digital forensics frameworks, reverse engineering tools, wireless protocol security analysis, embedded system penetration testing
- **Applied Research:** Integrating theoretical cryptanalysis with practical security implementations for real-world threat scenarios

Université Bretagne Sud Bretagne, France
CYBERUS Master in Cybersecurity Sept 2024 – Jul 2025

- **Security Research Foundation:** Advanced Cryptology, Penetration Testing Methodologies, Vulnerability Research, Secure Programming Paradigms, Security by Design Principles, Risk Analysis and Management
- **Academic Excellence:** Full scholarship recipient - ranked top 5% of international applicants through competitive technical assessment
- **Research Specialization:** Malware Analysis Techniques, Security Architecture Design, Threat Intelligence, Incident Response Automation
- **Contact:** Guy Gogniat (Associate Professor & Programme Coordinator)

Università degli Studi dell'Insubria Lombardia, Italy
Bachelor of Science in Computer Science Sept 2021 – July 2024

- **Security-Focused Curriculum:** Low-level Computer Architecture, Operating System Security, Network Protocol Analysis, Computational Cryptography Theory, Secure Systems Design
- **Academic Achievement:** 110/110 cum Laude (First Class Honours) - demonstrated excellence in technical research and system security
- **Technical Foundation:** Assembly programming, kernel-level security, network protocol implementation, mathematical cryptography, secure memory management
- **Contact:** Mauro Ferrari (Head of Department of Theoretical & Applied Sciences)

Ostbayerische Technische Hochschule Amberg-Weiden Bayern, Germany
Exchange Program in Digital Technology and Management Sept 2022 – Sept 2023

- **Hands-on Security Operations:** Advanced SPLUNK SIEM implementation, network packet analysis using Scapy framework, secure cloud architecture design
- **Cross-cultural Technical Collaboration:** Led multinational cybersecurity assessment teams, enhanced German language proficiency for technical communication

- **Practical Security Research:** Conducted real-world penetration testing scenarios and developed automated threat detection workflows

Experience

Cybersecurity Research Intern Remote
Babes-Bolyai University April 2025 – July 2025

- **Breakthrough Research Achievement:** Engineered novel Graph Attention Network-based Intrusion Detection System achieving 99% threat detection accuracy on standardized datasets
- **Advanced Threat Modeling:** Revolutionized network traffic analysis by representing complex network behaviors as graph structures, enabling real-time anomaly detection
- **Research Innovation:** Published methodologies for AI-driven security analytics that outperformed traditional signature-based detection systems
- **Technical Leadership:** Mentored junior researchers in machine learning security applications and graph neural network implementations

Security-Focused Software Development Intern Milano, Italy
ALTEN Feb 2024 – June 2024

- **Automation Security Innovation:** Architected AI-powered security automation framework that eliminated 90% of manual security monitoring tasks for enterprise clients
- **Secure Development Leadership:** Implemented security-by-design principles in bachelor thesis project, resulting in automated threat response system
- **Enterprise Security Integration:** Collaborated with international security teams to deploy scalable solutions across 4 major client infrastructures serving 100-1000+ users
- **Performance Impact:** Delivered measurable security improvements through intelligent automation, reducing incident response time by 85%

Cybersecurity Education Specialist Remote
Kodland May 2023 – May 2024

- **Security Education Impact:** Educated 100+ students across international cohorts in secure coding practices, vulnerability prevention, and cybersecurity fundamentals
- **Curriculum Development:** Designed hands-on Python security modules and web application security training programs for diverse cultural backgrounds
- **Cross-cultural Leadership:** Mentored students from 15+ countries, developing multilingual communication skills essential for global security research collaboration

Security-Aware Full Stack Developer Milano, Italy
WebRatio June 2021 – Sep 2022

- **Secure Architecture Design:** Engineered security-first web applications serving 100-1000+ users across 4 enterprise projects with major international clients
- **Vulnerability Prevention:** Implemented comprehensive security controls including SQL injection prevention, XSS mitigation, and secure authentication systems
- **Security Integration:** Pioneered secure SDLC practices, conducting code security reviews and threat modeling sessions with development teams
- **Contact:** Massimo La Rosa (Director of Services)

Technical Skills

- **Security Research & Development:** Graph Neural Networks, AI threat detection, machine learning security, cryptographic algorithm design, vulnerability research methodologies, automated security analysis
- **Low-level Security Programming:** Advanced C/C++ with memory safety focus, Python for security automation, Java secure coding, Assembly for reverse engineering, secure concurrency control
- **Cybersecurity Specializations:** Network protocol security analysis, penetration testing frameworks, cryptanalysis techniques, malware reverse engineering, digital forensics, IoT security assessment
- **Security Architecture & Design:** Security-by-design principles, threat modeling, secure SDLC implementation,

enterprise security frameworks, risk assessment methodologies

- **Research Tools & Platforms:** SPLUNK SIEM, Scapy network analysis, Wireshark, Metasploit, Burp Suite, IDA Pro, Graph analysis frameworks, Statistical cryptanalysis tools

Research Projects

Graph Neural Networks for Advanced Threat Detection Research Defense

- **Research Innovation:** Successfully defended groundbreaking 99% accuracy IDS using Graph Attention Networks for router infrastructure security
- **Technical Breakthrough:** Pioneered graph-based network behavior analysis, surpassing traditional detection methods by 25% accuracy improvement
- **Real-world Impact:** Demonstrated scalable threat detection for enterprise networks, with potential applications in critical infrastructure protection

AI-Driven Security Automation for Critical Infrastructure Bachelor Thesis

- **Automation Achievement:** Engineered intelligent security incident response system reducing manual intervention by 90% for enterprise IT infrastructure
- **Security Innovation:** Implemented secure Robotic Process Automation with advanced threat correlation and automated vulnerability assessment
- **Technical Excellence:** Achieved cum laude recognition for novel approach to security automation using Python, Selenium WebDriver, and ML frameworks

Novel Lightweight Cryptography Using Cellular Automata Crypto Research

- **Cryptographic Innovation:** Designed resource-efficient image encryption algorithm using Conway's Game of Life for IoT and embedded security applications
- **Security Analysis:** Conducted comprehensive statistical cryptanalysis and iterative security improvements, achieving strong randomness properties
- **Research Contribution:** Developed novel approach to lightweight cryptography suitable for resource-constrained environments and edge computing

Low-Level Security and Concurrency Control Systems Security

- **Memory Safety Research:** Implemented secure resource sharing and race condition prevention mechanisms in C, focusing on kernel-level security
- **Concurrency Security:** Developed robust mutex libraries and synchronization primitives preventing common security vulnerabilities in multi-threaded applications
- **Vulnerability Prevention:** Applied advanced secure coding practices for memory management, eliminating buffer overflow and time-of-check-time-of-use attacks

Advanced Secure C++ Development Framework C++ Security

- **Memory-Safe Architecture:** Engineered advanced C++ security implementations using RAII patterns, move semantics, and strict memory control for vulnerability prevention
- **Secure Design Patterns:** Developed comprehensive secure object lifetime management and dynamic polymorphism frameworks for enterprise security applications
- **Best Practice Implementation:** Applied STL security best practices and modern C++ features to create robust, attack-resistant software components

International Skills & Collaboration

- **Multilingual Technical Communication:** Fluent English, Italian, Spanish; conversational German and French - enabling effective collaboration in international security research teams and cross-border threat intelligence initiatives
- **Cross-cultural Research Leadership:** Proven experience leading multinational cybersecurity projects across 4+ countries, with demonstrated ability to adapt communication styles and technical approaches to diverse cultural contexts
- **Global Security Perspective:** International academic and professional experience providing unique insights into regional security challenges, compliance frameworks, and threat landscapes across European markets

Personal Interests & Continuous Learning

Beyond cybersecurity research, I pursue classical piano and music production, which enhances creative problem-solving abilities essential for innovative security research. I maintain physical and mental well-being through competitive swimming and travel extensively to understand diverse technological landscapes. I actively participate in Capture The Flag competitions and security conferences to stay current with emerging threats and cutting-edge defensive techniques.