




LORENZO BINOSI

CONTACT INFORMATION

Ph.D. Student

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SHORT BIOGRAPHY

I received my master's degree from Politecnico di Milano in Italy, and I'm currently a Ph.D. student in Dipartimento di Elettronica, Informazione e Bioingegneria (DEIB). My main research is about new approaches and methodologies for the security analysis of embedded devices, specifically focusing on software components. However, I am interested in various topics of Computer Security and, during my free time, I either play Computer security competitions called CTF (Capture The Flag) or expand my knowledge by reading the latest research. I also teach cyber-security to students ranging from high school to M.Sc.

RESEARCH INTEREST

My research mainly focuses on the security of Embedded Devices. There are several challenges when it comes to assessing the security of these devices, especially because the approaches that we use nowadays for modern computers, like fuzzing, cannot be applied as they are on Embedded Devices. As a result, I'm investigating new methodologies and approaches for the security of these devices, mainly leveraging reverse engineering and automated vulnerability discovery tools. I enjoy developing new reverse engineering tools that I can use during the analysis of binaries, especially those coming from C/C++ projects. I love finishing the analysis by exploiting the vulnerabilities that I find, both for fun and for investing advance exploitation attacks.

EDUCATION

PhD Computer Science and Engineering

2020–current

Politecnico di Milano, Italy

Theme: *New approaches and methodologies for the security analysis of embedded devices*

Laurea Magistrale (M.Sc) Engineering of Computing Systems

2016-2019

Politecnico di Milano, Italy

Disertation Title: *Recognition of Inlined Binary Functions from Template Classes*

Laurea (B.Sc) Computer Engineering

20011-2015

Politecnico di Milano, Italy

EXPERIENCES

Astrocast Collaboration

2020–2021

I participated in a collaboration between Politecnico di Milano and a Swiss company called Astrocast. Astrocast aims to establish a global satellite network for IoT applications. Their primary commercial product is the Astronode Dev Kit, a board with an STM32 microprocessor that manages the communications between a user application and the Astrocast satellites. I was asked to assess the security of the Astronode Dev Kit, with particular emphasis on key management, hardware configurations, and software vulnerabilities. I discovered and reported two major vulnerabilities in the hardware configurations that could lead to a complete leakage of the entire firmware.

INVITED TALKS

- *Cybersecurity competitions(CTFs)*,
MEET me TONIGHT, Milan, Italy – Online.

2021

TEACHING

Teaching Assistant, *Computer Security*, Politecnico di Milano.
Computer Science and Engineering - M.Sc. Level

2020–current

Teaching Assistant, *Offensive and Defensive Cybersecurity*, Politecnico di Milano. 2020–current
Computer Science and Engineering - M.Sc. Level

Teaching Assistant, *TechCamp*, Politecnico di Milano. 2020–current
TechCamp Summer School is a program that aims to introduce high school students to several topics taught at Politecnico di Milano. Our topic was about cybersecurity.

Instructor *cyberchallenge.it*, <http://cyberchallenge.it> 2019–current
cyberchallenge.it is a university initiative to train young (16-22 years old) students as CTF players. Since 2019 I have been given several lectures on binary exploitation, training 20+ students each year.

Project Tutor, *Master CyberSecurity*, CEFRIEL, 2 Students. 2020–current

CTF & CYBERRANGE

TEAMS

Player, *Tower of Hanoi*, 20+ players, <http://toh.necst.it> 2018–current Tower of Hanoi is the CTF team of Politecnico di Milano. It is the oldest (2004) still active Italian team. I joined Tower of Hanoi in 2018 and currently one of the oldest member of the team. This team won the 2019 RuCTF Final, one of the most known Attacks and Defence CTF

Player, *mhackeroni*, 40+ players, <http://mhackeroni.it> 2018–current
This team is born as the joining of several Italian CTF teams with the goal of qualifying for DEF CON CTF. Since its birth in 2018, we were able to qualify at this prestigious competition every year (4 times). In 2019 we won 35c3 CTF

RELEVANT COMPETITIONS QUALIFICATIONS AND RESULTS

RuCTF Final, *Tower of Hanoi*, Ekaterinemburg 2018

DEF CON CTF Final, *mhackeroni*, Las Vegas 2018

35c3 CTF, *mhackeroni*, 1st Place, Online 2018

DEF CON CTF Final, *mhackeroni*, Las Vegas 2019

CTFZone 2020 Finals, *mhackeroni*, Online 2020

DEF CON CTF Final, *mhackeroni*, Las Vegas 2020

DEF CON CTF Final, *mhackeroni*, Las Vegas 2021

CSAW CTF Final, *Tower of Hanoi*, 1st Place, Online 2021

MASTER THESIS CO-ADVISOR [Aiding global function pointer hijacking for post-CET binary exploitation](#), 2022
Marco Bonelli - Alessandro Bertani