Luca Di Bartolomeo

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Education

2021 - 2025 PhD at **EPFL** Lausanne with the HexHive group. Planned research areas are binary rewriting, binary defense mechanisms, and side channel attacks.

2018 - 2021 Master Degree in Computer Science at **ETH** Zurich.
My *Master thesis* involves adding support for the ARM architecture to Retrowrite, a binary rewriter that adds memory sanitization and coverage tracing to closed source binaries, with the goal of fuzzing proprietary Android kernel modules.

2015 - 2018 Bachelor's Degree in Computer Science at **La Sapienza** university of Rome.
Final grade: 110/110, with honours. Awarded scolarship for the "Excellence path".

Work Experience

Sep-Dec 2019 **ETH - Teaching Assistant** for the "Algorithms Lab" course. I taught master students competitive programming techniques and the basics of computational geometry. Course webpage

Jun-Sep 2018 **Radareorg - Google Summer of Code scholar**, for the radare2reverse-engineering framework. I reworked the terminal user interface, improving the graph drawing algorithm, command syntax, autocompletion engine, and added UTF-8 compatibility. Short recap of my contributions.

Sep-Dec 2018 **La Sapienza - Teaching assistant** for the Competitive programming course, aimed at preparing highschool students for the regional contest of the Italian Olympiads in Informatics.

Jun-Sep 2017 **Spiketrap - Research intern**. Developed a sentiment analysis model for short reddit comments using a variety of machine learning frameworks (sklearn, keras)

Feb-Oct 2015 **Codemotion Kids - Coding teacher** I taught middle school students the basics of Java and introduced primary school children to programming with Scratch.

Awards

2019 **CTF competitions:** Since 2018 I've been an active player in the ETH Capture The Flag team, catching many flags and helping them get some important victories such as the first overall place in the latest Swamp CTF and first academic place (9th overall) in the latest Insomnihack CTF. Link to our team on CTFtime.

2019 **ETH Cybersecurity Codecon:** First place winner of an internal ETH Zurich competition about cybersecurity. Won a trip to New York, where I spent a week working together with Bloomberg's security team. Here is an article on ETH's blog describiing the experience.

2018 **Google Hashcode:** We got the first place in Italy (out of 300 Italian teams), 85th place in the world (out of 5000 teams) in the Hashcode 2018 competition.

2018 **Cyberchallenge.it:** An italian CTF competition for college and high-school students. I placed third on the national scoreboard and first on my college's scoreboard.

2017 **ACM-ICPC SWERC**: Honorable mention as a member of the "Sapienza" team, both in 2016 in Porto and in 2017 in Paris.

2016 **Excellence path**: As one of the top 5 ranking students during my bachelor at "La Sapienza", I was awarded the excellence path scholarship. It covered the reimbursement of the tuition fee and the chance to work with professors to do an additional research project.

2015 **Italian Olympiads in Mathematics**: I got the bronze medal in the national finals individually, and a silver medal in the national finals competing with a team for which I was the captain.

2014 **Italian Olympiads in Informatics**: Awarded the silver medal for obtaining the 12th place nationwide. Thanks to my results, I was admitted to the IOI training camps.

Projects / Community involvement

2020 **PokeCTF**: a minimal CTF platform I created for internal trainings in our ETH Capture the Flag team. Link to the repo.

2018 **Raymarching distance fields:** rendered a procedurally generated volcanic archipelagus entirely made in the fragment shader in GLSL for the final project of the Computer Graphics course. Link to short pdf description. Link to live demo on shadertoy.

2015 **Exhibitor at Codemotion Rome**: I was the main coder of "Pico", a Google Cardboard flight simulator for Android in which the player controlled the wings of the plane by holding two Wii controllers (connected via bluetooth to the Android phone). The game got featured at Codemotion Rome 2015.

2014 **Musical Floppies**: developed for my high school thesis, I connected 8 old floppy drives with an Arduino, and by moving their stepper motors at precise frequences I was able to play tunes with the noise they produced.