

Michele Beretta

Curriculum Vitae

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📧 michele-beretta 🆔 0009-0003-4026-8589 🎓 scholar

PERSONAL INFORMATION

I am a researcher at the University of Bergamo, Italy, currently working with the Seclab research group.

EDUCATION

- **PhD in Engineering and Applied Sciences** 2023 – present
Università degli Studi di Bergamo Bergamo, Italy
- **MSc in Computer Science and Engineering** 2020 – 2022
Università degli Studi di Bergamo Bergamo, Italy
Thesis: *Enhancing WASI Sandboxes: Restricting WebAssembly Runtimes with Linux Security Modules*
Advisor: Prof. Stefano Paraboschi
Graduated with 110L (summa cum laude)
- **BSc in Computer Science and Engineering** 2017 – 2020
Università degli Studi di Bergamo Bergamo, Italy
Thesis: *FreyaFS: A virtual file system with Mix&Slice support*
Advisor: Prof. Stefano Paraboschi
Graduated with 110L (summa cum laude)
- **IT Technical Institute** 2012 – 2017
Istituto E. Majorana Seriante, Italy
Graduated with 100L (summa cum laude)

WORK EXPERIENCE

- **Security researcher** 2023 – present
Università degli Studi di Bergamo Bergamo, Italy
A research position with the UniBG Security Lab. The main focus of research is WebAssembly and sandboxing technologies.
Acquired skills: **WebAssembly, Landlock, eBPF, Scientific writing, Teaching.**
- **Occasional consulting work** 2022 – present
Various consulting work in Web and Mobile technologies. Among others, coded a real-time notification delivery system in Elixir.
Acquired skills: **Elixir, REST, Soft real-time systems.**
- **Web & Mobile Developer** 2012 – 2021
Info-bit S.r.l. Gorlago, Italy
Developed and designed a HR management website in JavaScript (React) and a React Native mobile app handling tens of thousands of daily usages.
Acquired skills: **JavaScript, React, Project management, Mobile development** (iOS, Android, React Native).

SKILLS

- **Computer Languages**

Haskell, Elixir, JS/HTML/CSS, Python, Rust, C/C++, SQL, L^AT_EX, Shell scripting, Java, Scala, WebAssembly.

- **Systems**

Linux, macOS, Windows.

- **Frameworks & Tools**

React/React Native, Keras, NodeJS, Deno, Makefiles, Landlock, eBPF.

- **Software Engineering**

Software architecture, Functional programming, Object-oriented programming, Software design, Version control (Git), Project management, Web development, Mobile development.

AWARDS & RECOGNITION

- **Scholarship “Roberto Rocca” Dalmine S.p.A.**

2021

A private scholarship for graduated bachelor students with a grade over 100/110 and a GPA over 3.60/4.00 in the first year of the MSc degree.

- **Top Ten Students Program**

2017, 2018, 2019, 2020, 2021

A scholarship by the University of Bergamo for students with a GPA over 3.73/4.00.

- **National Kangorou Competition**

2014

A national group coding challenge, ranked 2nd place on a national level.

- **Italian Computer Science Olympics**

2013

A national group problem solving challenge, ranked 12nd place on a national level.

LANGUAGES

- **Italian**

Native.

- **English**

Fluent.

- **Japanese**

Elementary.

PROJECTS

- **Integration between WASM runtimes and Landlock**

Rust

<https://github.com/micheleberetta98/rust-wasm-landlock>

The work for my master’s thesis. It is an integration between Wasmtime and the Landlock LSM for the restriction of WASI runtimes.

- **FreyaFS**

Python, C/C++

<https://github.com/micheleberetta98/freya-fs>

My bachelor thesis. It’s a virtual file system for Linux/macOS written with Python and FUSE supporting transparent encryption.

- **Hasking**

Haskell

<https://github.com/micheleberetta98/hasking>

A very simple Turing Machine interpreter with its own parsable language and a TUI.

- **QKD Simulation**

Elixir, \LaTeX

<https://github.com/micheleberetta98/qkd-sim>

A project for the master's course of Computer Security. It's a multi-threaded simulation of the BB84 quantum key distribution protocol in Elixir.

HOBBIES

Travelling, Hiking, Languages, Photography.

PUBLICATIONS

- [1] Marco Abbadini, Michele Beretta, Dario Facchinetti, Gianluca Oldani, Matthew Rossi, and Stefano Paraboschi. “Lightweight Cloud Application Sandboxing”. In: *Proceedings of the 14th IEEE International Conference on Cloud Computing Technology and Science (IEEE CLOUDCOM 2023)*. 2023. URL: <https://cs.unibg.it/seclab-papers/2023/CLOUDCOM/dmng.pdf>.
- [2] Marco Abbadini, Michele Beretta, Dario Facchinetti, Gianluca Oldani, Matthew Rossi, and Stefano Paraboschi. “POSTER: Leveraging eBPF to enhance sandboxing of WebAssembly runtimes”. In: *Proceedings of the 18th ACM ASIA Conference on Computer and Communications Security (ACM ASIACCS 2023)*. 2023. DOI: 10.1145/3579856.3592831. URL: <https://cs.unibg.it/seclab-papers/2023/ASIACCS/poster/enhance-wasm-sandbox.pdf>.
- [3] Marco Abbadini, Michele Beretta, Sabrina De Capitani di Vimercati, Dario Facchinetti, Sara Foresti, Gianluca Oldani, Stefano Paraboschi, Matthew Rossi, and Pierangela Samarati. “Supporting data owner control in IPFS networks”. 2023.
- [4] Stefano Paraboschi et al. *D4.3 – Final Encryption-based Techniques*. Tech. rep. MOSAICrOWN, 2020. URL: <https://mosaicrown.eu/wp-content/uploads/2021/03/D4.3.pdf>. (Deliverable) Co-authored Chapter 2: *Integration of the Aesmix library with a file system*.