

# Matteo Bertrone

SOFTWARE ENGINEER · RESEARCH ASSISTANT AT POLYTECHNIC OF TURIN

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“Everyone thinks of changing the world, but no one thinks of changing himself” - Leo Tolstoy

## Objective

I'm a software engineer with a strong background in network programmability, eBPF, and XDP. Looking for opportunities, aiming to solve real-world problems, working with a great team, in networking or other fields.

## Work Experience

### Polytechnic of Turin

RESEARCH FELLOW & SOFTWARE ENGINEER (C++, eBPF, Go)

- Simplify creation of eBPF network programs, by developing a library oriented to developers.
- Implement and design a framework (PolyCube), to deploy and configure network services.

Turin, Italy

Jan. 2017 - PRESENT

### Huawei Technologies

INTERN (C++, eBPF, Go)

- Improve firewall performance, by introducing on-the-fly data path recompilation.
- Mitigate DDoS attacks, by dynamically offloading drop rules with XDP.

Santa Clara, CA, U.S.A.

May. 2018 - Jun. 2018

### Nebbiolo Technologies, INC.

CONSULTANT (C++, eBPF, Go)

- Design and implement a 15% faster bridging solution, as a substitute of Linux bridge.

Milpitas, CA, U.S.A.

Feb. 2017 - May. 2017

### PLUMgrid INC. (Acquired by VMware)

INTERN (eBPF, Go)

- Extend OpenStack networking backend, by architecting and implementing an eBPF based network plugin.
- Increase visibility by open sourcing under iovisor community, and presenting at OvS Fall conference 2016 (San Jose, CA).

Santa Clara, CA, U.S.A.

Sep. 2016 - Jan. 2017

### Independent

SEO FOR A SERVICE COMPANY (GOOGLE SEARCH CONSOLE, ANALYTICS, ADS, FACEBOOK ADS, HTML, CSS)

- Increase organic traffic +600% (+14k unique users/year), by improving contents, mobile responsiveness, site speed.
- Improve local visibility with remarketing campaigns, and targeted advertisement.

Turin, Italy

Jan 2016 - Dec 2018

### EiSWORLD

SOFTWARE DEVELOPER FOR FIAT CHRYSLER AUTOMOBILES (C#)

- Improve issue tracking and debugging on dealers network, by developing network analysis and diagnostic tool for FCA.

Turin, Italy

Mar. 2014 - May. 2014

## Projects & Open Source

### PolyCube

CORE DEVELOPER - POLYCUBE IS AN OPEN SOURCE FRAMEWORK TO BUILD VIRTUAL NETWORK FUNCTIONS WITH XDP AND eBPF

- Responsible for designing and implementing core daemon API and daemon-service interface.
- Provide working services to users, by developing bridge, router, nat, and DDoS mitigator functions.

[github.com/polycube-network](https://github.com/polycube-network)

Jan. 2017 - PRESENT

### bpf-iptables

CORE DEVELOPER - BPF-IPTABLES PROVIDES IPTABLES FIREWALL FUNCTIONALITIES WITH XDP AND eBPF

- Improve performance by a factor of 10, adapting matching algorithms to fit with eBPF architecture.

[github.com/mbertrone/bpf-iptables](https://github.com/mbertrone/bpf-iptables)

Feb. 2018 - PRESENT

### iovisor-ovn

MAIN DEVELOPER - IOVISOR-OVN PROVIDES AN EFFICIENT DATA PLANE REPLACEMENT FOR OPENSTACK NETWORKING.

[github.com/iovisor/iovisor-ovn](https://github.com/iovisor/iovisor-ovn)

Sep. 2016 - Jan. 2017

## Teaching

### Polytechnic of Turin

TEACHING ASSISTANT - COURSES: COMPUTER NETWORKS - COMPUTER NETWORKS TECHNOLOGIES AND SERVICES

- Led students during laboratory experience with frontal lessons and practical assistance.
- Mentored students, who graduated with excellent votes, by reviewing master's thesis projects.

Turin, Italy

Jan 2018 - Dec 2018

## Skills

**Programming** C, C++, eBPF, Go, C#, LaTeX  
**Others** Linux, Git, Wireshark  
**Languages** Italian (native), English (fluent)

## Education

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### Polytechnic of Turin

MASTER'S DEGREE, COMPUTER ENGINEERING, CUM. GPA: 4.0/4.0

*Turin, Italy*

*2014 - 2016*

### Polytechnic of Turin

BSC DEGREE, COMPUTER ENGINEERING, CUM. GPA: 4.0/4.0

*Turin, Italy*

*2011 - 2014*

## Publications

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### Accelerating Linux Security with eBPF iptables

ACM SIGCOMM 2018 CONFERENCE POSTERS AND DEMOS

*Budapest, Hungary*

*20-25 August 2018*

### Toward an eBPF-based clone of iptables

NETDEV OX12, THE TECHNICAL CONFERENCE ON LINUX NETWORKING

*Montréal, Canada*

*11-13 July 2018*

### Creating Complex Network Services with eBPF: Experience and Lessons Learned

IEEE INTERNATIONAL CONFERENCE ON HIGH PERFORMANCE SWITCHING AND ROUTING

*Bucharest, Romania*

*17-20 June 2018*

## Presentation

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### Open vSwitch Fall Conference

DEMO - COUPLING THE FLEXIBILITY OF OVN WITH THE EFFICIENCY OF IOVISOR: ARCHITECTURE AND DEMO

*San Jose, CA, U.S.A.*

*Nov. 2016*

## Honors & Awards

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- 2017 **Scholarship**, promoted by Polytechnic of Turin, Orchestration of cloud services and data center network with portability and lightness
- 2016 **Scholarship**, promoted by FCA, for excellent academic performance
- 2010 **Bronze medal**, out of 10k participants, at Italian Olympics in Computer Science

*Turin, Italy*

*Turin, Italy*

*Sirmione, Italy*