

Sebastiano MIANO

E-mail: sebastiano.miano@polito.it
Cell: +39 3484775869
Telephone: +39 0931947516
Skype: sebymiano92
Website: <https://sebymiano.github.io/>
LinkedIn: <https://it.linkedin.com/in/sebymiano92>
GitHub: <https://github.com/sebymiano>



Personal Information

Date of birth: 14th January 1992
Place of birth: SIRACUSA (SIRACUSA)
Address: Via Canale 42/A, 96010 CANICATTINI BAGNI (SR)
Age: 26

Profile Overview

I was born in a small regional town in Sicily, Italy, having attended the high school "Liceo Scientifico Leonardo Da Vinci" in Canicattini Bagni. At Catania University, I gained a Bachelor's Degree, 110/110, summa cum laude, in Computer Engineering. I also hold a second degree for music as a Conservatory Graduate in Trumpet Performance.

In December 2015, I completed my Master's degree in Computer Engineering at Polytechnic University of Torino, 110/110, summa cum laude and, in November 2016 I started a Ph.D. in Computer Science at Polytechnic University of Torino. My research focuses on the design of new architectures to improve the packet processing in virtualized environments, mainly exploiting technologies such as eBPF, XDP.

I am motivated and enthusiastic by new challenges and tasks; I take an excellent approach to achieve success in all projects. I like to work on complex projects, which allow me to learn and face new challenges. I love anything to do with technology [hence my career choice], music, in particular playing the trumpet is another passion, as well as volleyball and football.

Pre-university studies

2010

SCIENTIFIC CERTIFICATE

School-leaving examination mark: 86/100
Secondary school diploma: Italian Secondary School Diploma

Academic studies

2016 – Present



1. Doctor of Philosophy (Ph.D.)
Polytechnic University of Torino
Engineering Faculty
PhD Cycle: XXXII

Name of the course of study: PhD in COMPUTER AND CONTROL ENGINEERING

Mainly focusing on Host Dataplane Acceleration using eBPF/XDP. During the first two years of my PhD I designed a new architecture to execute chain of VNFs composed as a set of eBPF programs, which provides huge benefits to local applications running on the host, without requiring custom kernels or invasive software frameworks.

Currently, I am trying to model the behavior of those NFs in order to define a mechanism for their automatic optimization, thanks to the dynamic reloading feature of eBPF and the possibility to recompile the code at runtime.

Track: Software Defined Networks, Network Function Virtualization, Computer Networks
Networking: IPv6, MPLS, VPN, VoIP, QoS, routing algorithms, WAN technologies, socket programming

2013 – 2015



2. Degree course: 2nd cycle degree - Master

Polytechnic University of Torino
Facoltà di INGEGNERIA

LM-32 – 2nd level degree in Computer engineering

Name of the course of study: CORSO DI LAUREA MAGISTRALE IN INGEGNERIA INFORMATICA

Track: Networking, Security and Mobile Development

Networking: IPv6, MPLS, VPN, VoIP, QoS, routing algorithms, WAN technologies, socket programming
Security: cryptography, authentication, network and application security, attacks and risks assessment
Mobile: Android and .NET Micro Framework application development

Final degree mark: 110/110 cum laude

GPA: 4.0/4.0

Age at graduation: 23 First academic year of enrollment: 2013 | Official time limit for the degree course: 2 years

Dissertation/Thesis title: OPTIMIZED TRAFFIC CONTROL USING SDN IN A BUSINESS LAN ENVIRONMENT

Thesis subject: Software Defined Networking | Thesis supervisor: FULVIO GIOVANNI OTTAVIO RISSO

Type of dissertation/thesis: Experimental

Abstract: OpenFlow represents a new powerful paradigm that combines the flexibility of the software with the efficiency of a programmable hardware switch. However, such an approach is currently reserved for new hardware devices, specifically engineered for this paradigm.

This thesis presents the experience and findings about selectively offloading OpenFlow rules into a non-OpenFlow compatible

hardware switch silicon, which enables existing (legacy) hardware ASICs to become compatible with the SDN paradigm. It presents a solution that transparently offloads the portion of OpenFlow rules supported by the hardware while keeping in software the remaining ones, and that is able to support the presence of multiple hardware tables although with limited capabilities in terms of matches and actions.

22/07/2013



3. Degree course: 1st level degree – Degree/Bachelor
Università degli Studi di CATANIA
Facoltà di INGEGNERIA
L-8 – 1st level degree in Information technology
Name of the course of study: BACHELOR DEGREE ON COMPUTER ENGINEERING

Final degree mark: 110/110 cum laude **GPA: 3.85/4.0**
 Age at graduation: 21 First academic year of enrollment: 2010 | Official time limit for the Bachelor's degree course: 3 years

Dissertation/Thesis title: MOBILE MANAGEMENT SYSTEM OF ACADEMIC REPORT CARDS: MOBILE APPLICATION
Original title: SISTEMA DI GESTIONE DEL LIBRETTO DI GIUSTIFICAZIONE SCOLASTICO: APPLICAZIONE MOBILE
 Thesis subject: ARCHITETTURA INTERNET E PROGRAMMAZIONE WEB | Thesis supervisor: MANGIONI GIUSEPPE
 Thesis keyword: Titanium, Mobile Programming, JavaScript
 Type of dissertation/thesis: Experimental

2003-2010

4: Degree course: Conservatory Graduate in Trumpet Performance
 Institution: **Conservatory of Reggio Calabria** (2003 to 2010)




Foreign language skills

Mother tongue	Italian		
Languages skills	English	Excellent	Excellent
	French	Limited	Limited
	English Certificate	IELTS	

Information Technology (IT) skills

Specific skills	Programming languages: Java, C, C++, Python, Ruby, Javascript, C#, Assembly x86, HTML, CSS, PHP, SQL, NET, NET Micro Framework, VHDL, Assembly MIPS, Android, Objective-C, Latex
Certifications	ECDL (European Computer Driving Licence)

Work Experience

Date	April 2016 – October 2016	
Company Name	EIT Digital (http://www.eitdigital.eu/) – San Francisco (CA), United States	
Title	Software & Network Engineer Research Intern	
Project Description	In San Francisco, I had the opportunity to attend a workshop spearheaded by leaders from the IEEE SDN Initiative and EIT Digital where I presented the challenges which need to be addressed for building an SDN Federated Testbed. During my internship, I participate in an effort with ON.Lab, Softfire and EIT Digital to set up the infrastructure of an SDN Federated Testbed. I demo of the portal I created is available at http://openfederatedtestbed.org	
Date	April 2016 – October 2016	
Company Name	Politecnico di Torino	
Title	Research Fellow	
Project Description	From April to October 2016 I become a research fellow at Politecnico di Torino, where I worked on innovative solutions, in the SDN and NFV area, for employing native components (both software and hardware) on resource-constrained CPEs together with defining a model to export these components to external entities.	
Date	January 2016 – April 2016	
Company Name	Ennova Group (http://www.ennova.it/) – Torino, Italy	
Title	IT Network Consultant	
Project Description	During these three months of consulting for Ennova I focused on two different matters: - Estimating the maximum capacity of a path from a host in the WLAN to a specific server in an ISP data center	

	<p>- Measuring the available bandwidth in a given wireless path without interfering with the current traffic</p> <p>One of the things that made this an innovative work is that we need this estimation from a separate device in the WLAN (not the access point), which needs to "sniff" the traffic in the network and determine the real available bandwidth of a single host in the WLAN.</p>
--	---

Date	June 2015 – November 2015
-------------	---------------------------

Company Name	Berlin Institute for Software Defined Networks GmbH (http://www.bisdn.de/) - Berlin, Germany
---------------------	---

Title	Software & Network Engineer Intern
--------------	------------------------------------

Project Description	<p>Design and implementation of an OpenFlow interface in front of an L2 switch embedded in a Freescale QorIQ T1040 SoC.</p> <p>The aim of this work was to produce a new generation of CPE with the OpenFlow protocol support for active management and network troubleshooting, while still maintaining the performance of a hardware switching.</p> <p>The implemented driver is available on GitHub at https://github.com/sebymiano/xdpd</p>
----------------------------	---



Date	January 2013 – September 2013
-------------	-------------------------------

Company Name	NetService (www.net-serv.it) - Catania, Italy
---------------------	--



Title	Software Engineer Intern
--------------	--------------------------

Project Description	<p>The system "Libretto delle Giustificazioni" had the objective to make the participation in the school life of a certain class of individuals (managers, administrators, teachers, students and parents) more effective and transparent. In particular, I participated in the creation of a series of mobile applications created using a new framework called Titanium, which allows the creation of native applications based on a common code written in Javascript.</p>
----------------------------	---

Personal projects

C++ server for swagger-codegen	<p>As part of a research project, I added a new generator to the swagger-codegen project. The new generator allows creating a C++ server stub, based on the Pistache framework, starting from a swagger (OpenAPI) specification. After this contribution, I became part of the swagger-codegen contributors (https://github.com/swagger-api/swagger-codegen/).</p>
---------------------------------------	--

YANG-to-REST generator	<p>This project involves the creation of a full REST server specification (swagger-compatible) starting from a YANG model. I implemented it extending Pyang, an extensible YANG validator, and converter written in python, with a new plugin that allows the translation between YANG models to OpenAPI (swagger) specification.</p> <p>The code is available on GitHub at https://github.com/sebymiano/pyang-swagger.</p>
-------------------------------	--

A control & management plane for IO Modules (based on eBPF and IOvisor)	<p>As part of the iovisor-ovn academic project, we designed a slowpath architecture for IOModules (eBPF programs written through the IOvisor framework) to overcome the limitation of eBPF. This slow path, implemented in user space, is opposed to the "fast path" we build with eBPF in the kernel and can be used to implement all the functionality not available in eBPF (e.g. broadcasting a packet to a variety of IO Modules).</p> <p>The project source code is available on GitHub at https://github.com/iovisor/iovisor-ovn.</p> <p>Advisor: Prof. Fulvio Rizzo</p>
--	---

Novajar OpenStack	<p>With the collaboration of computer network research group in Torino, I realized an OpenStack compute node driver (called nova-jar), which allows instantiating Java programs (JAR) as Virtual Network Functions from the OpenStack dashboard. The nova-jar driver receives the Java applications and creates a Docker container with a JVM (or uses an existing one), injecting the program into it. This approach reduces the cost of spawning a new VM and the time required to transfer the VNF to the compute node, which is prohibitive in a scenario where compute nodes have limited network resources.</p> <p>The project source code is available on GitHub at https://github.com/netgroup-polito/nova-jar.</p> <p>Advisor: Prof. Fulvio Rizzo</p>
--------------------------	---

NFC Driver for .NET MF	<p>I developed, a brand new NFC library for the NET Micro Framework.</p> <p>This library supports the following operations:</p> <ul style="list-style-type: none"> - Detection of an NFC Card - Reading of Mifare Classic and Ultralight cards - Writing and Formatting a Mifare Classic card <p>The creation of a new comprehensive library started from an already available code for Arduino: the PN532 library from Seed Studio and Don's NDEF implementation.</p> <p>Advisor: Prof. Guido Albertengo</p>
-------------------------------	---

Remote Control System	<p>Design and implementation of a client-server Windows application for the control and management of multiple clients. It is a software for sharing the server mouse and keyboard between multiple clients. It also allows exchanging each kind of clipboard's content between server and clients.</p> <ul style="list-style-type: none"> - Designed in C# and C++ - .NET Framework and Microsoft Visual Studio <p>Advisor: Prof. Giovanni Malnati</p>
------------------------------	--

Other Projects	<p>Personal projects have been conducted mostly at the university and they allowed me to roam between different fields and languages, including:</p> <ul style="list-style-type: none"> - Creation of a website using the Ruby on Rails framework
-----------------------	--

- Authentication system with RFID reader carried out by using Arduino and nodeJS for server side
- System for the management of a traffic light with an ARM based module

In addition to these projects, I had to deal with issues relating the management and design of SQL database and the knowledge of how to manage data warehouse and data mining algorithms. I also had the opportunity to learn languages for the hardware design and description like VHDL as well as the knowledge of MIPS and Intel x86 architecture with the respective assembler languages.

Publications

1. Bonafiglia, Roberto; Miano, Sebastiano; Nuccio, Sergio; Risso, Fulvio; Sapio, Amedeo (2016)
Enabling NFV Services on Resource-Constrained CPEs.
In: 5th IEEE International Conference on Cloud Networking (CloudNet), Pisa (IT), 3-5 October 2016.
2. Miano, Sebastiano; Risso, Fulvio; Woesner, Hagen (2017)
Partial Offloading of OpenFlow Rules on a Traditional Hardware Switch ASIC
In: 3rd IEEE International Conference on Network Softwarization (NetSoft), Bologna (IT), 3-7 July 2017.
3. Miano, Sebastiano; Bertrone, Matteo; Risso, Fulvio; Tumolo, Massimo, Vasquez Bernal, Mauricio (2018)
Creating Complex Network Services with eBPF: Experience and Lessons Learned
In: 19th IEEE International Conference on High Performance Switching and Routing (HPSR), Bucharest (RO), 17-20 June 2018
4. Miano, Sebastiano; Bertrone, Matteo; Risso, Fulvio; Tumolo, Massimo (2018)
Toward an eBPF-based clone of iptables
In: Netdev 0x12, The Technical Conference on Linux Networking, Montreal (Canada), July 2018
5. Miano, Sebastiano; Bertrone, Matteo; Risso, Fulvio; Tumolo, Massimo (2018)
Accelerating Linux Security with eBPF iptables
In: ACM SIGCOMM 2018 Conference Posters and Demos, Budapest (H), 20-25 August 2018