Tiziana Catena

ABOUT ME

Third year PhD Student with specialization in the field of Network Function Virtualization (NFV), focusing on the management and orchestration of virtual Network Functions to enable the support for innovative telecom services, from theory to the use of modern virtualization software.

WORK EXPERIENCE

Department of Information, Electronics and Telecommunications Engineering (DIET) Collaboration scholarship for students, intended for tutoring, for the functioning of the Library and the Didactic Laboratories at the DIET

SAPIENZA Università di Roma [2016 – 2018]

Occasional work for the "Implementation of an experimental Segment Routing network via PC and Linux software to support Service Function Chaining" as part of the "Cisco (Silicon Valley Foundation)" research project in favor of the department of Infor

SAPIENZA Università di Roma [09/2017 – 10/2017]

Occasional self-employment assignment for carrying out activities in support of the Monitoring Committee of the Faculty of Information Engineering, Computer Science and Statistics

SAPIENZA Università di Roma [02/2019 – 03/2019]

Internship at Fondazione Bruno Kessler (FBK) Research Center

Fondazione Bruno Kessler [23/05/2021 – 23/07/2021]

City: Trento

Country: Italy

In collaboration with the RiSING department of FBK, an orchestration platform has been implemented to efficiently deploy chains of virtualized security functions, from the mathematical model to the real implementation based on Kubernetes virtualization software.

EDUCATION AND TRAINING

Maturità Scientifica PNI, 100/100

Liceo Scientifico Marcello Malpighi [09/2008 – 07/2013]

Bachelor Degree in Communication Engineering, 110/110 cum laude
SAPIENZA Università di Roma [2013 – 2016]

Thesis: “Internet of Things – Stato dell’arte e scenari evolutivi”

Master’s Degree in Communication Engineering, 110/110 cum laude
SAPIENZA Università di Roma [2016 – 2018]

Thesis: “Proposal and Evaluation of a Scalable NFV Orchestrator based on a Segment Routing Control Technology”

PhD in Information and Communication Technology (ICT) with curriculum in Information and Communication Engineering
SAPIENZA Università di Roma [2018 – Current]

PUBLICATIONS

Reconfiguration of cloud and bandwidth resources in NFV architectures based on segment routing control/data plane.

[2019]

INTERNATIONAL CONFERENCE ON TRANSPARENT OPTICAL NETWORKS, vol. 2019-, p. 1-5, IEEE Computer Society

Proposal and investigation of an optical reconfiguration cost aware policy for resource allocation in network function virtualization infrastructures.

[2019]

INTERNATIONAL CONFERENCE ON TRANSPARENT OPTICAL NETWORKS, vol. 2019-, p. 1-5, IEEE Computer Society

Impact of the maximum number of switching reconfigurations on the cost saving in network function virtualization environments with elastic optical interconnection.

[2019]

APPLIED SCIENCES, vol. 9, p. 1-15

Effectiveness of segment routing technology in reducing the bandwidth and cloud resources provisioning times in network function virtualization architectures

[2019]

FUTURE INTERNET, vol. 11, p. 1-20

Study and investigation of SARIMA-based traffic prediction models for the resource allocation in NFV networks with elastic optical interconnection.

[2020]

INTERNATIONAL CONFERENCE ON TRANSPARENT OPTICAL NETWORKS, vol. 2020-, p. 1-4, IEEE Computer Society

Study and evaluation of QoS degradation costs in optical-nfv network environments with resource allocations based on long short term memory prediction techniques.

[2020]

INTERNATIONAL CONFERENCE ON TRANSPARENT OPTICAL NETWORKS, vol. 2020-, p. 1-5, IEEE Computer Society

Reconfiguration of optical-NFV network architectures based on cloud resource allocation and QoS degradation cost-aware prediction techniques.

[2020]

IEEE ACCESS, vol. 8, p. 200834-200850

Proposal and investigation of an artificial intelligence (Ai)-based cloud resource allocation algorithm in network function virtualization architectures.

[2020]

FUTURE INTERNET, vol. 12, p. 1-13

Application of a long short term memory neural predictor with asymmetric loss function for the resource allocation in NFV network architectures.

[2021]

COMPUTER NETWORKS, vol. 193, p. 108104-108116

CONFERENCES AND SEMINARS

Conferences

- ***5G International PhD School* aggregated to 5G ITALY conference, December 3-4-5 (2019 and 2020 edition), Rome**

International doctorate school that CNIT has conceived as a prestigious event, with a high scientific connotation, gathering the innumerable research opportunities that the 5G, and its desired applications, can offer.

- ***INW 2020 | 17th Edition of the Italian Networking Workshop*, January 29-31, Cavalese (TN)**

This workshop provides a forum to present recent and original work in various areas of telecommunication networks. In this occasion I presented my research work.

- ***21st International Conference on Transparent Optical Networks*, 9-13 July 2019, Angers (France)**

The scope of the conference is focused on the applications of transparent and all-optical technologies in telecommunications, computing, sensing, and novel applications. In this occasion I presented my proposal of a scalable NFV Orchestrator for a Multi-Domain data center environment interconnected by an optical network.

IEEE Conference on Network Function Virtualization and Software Defined Networks (NFV-SDN)

[Virtual, 09/11/2020 – 12/11/2020]

The 2020 IEEE NFV-SDN conference is an important forum for the ongoing exchange of the latest ideas, developments and results amongst ecosystem partners in both academia and industry. The conference fosters knowledge sharing and discussion on new approaches as well as work addressing gaps and improvements in NFV and SDN enabled architectures, algorithms and operational frameworks for virtualized network functions and infrastructures.

HONOURS AND AWARDS

Honours and awards

- Admission to the Excellence Program EP for Master's Degree in Communication Engineering.

The EP aims to enhance the training of students enrolled, deserving and interested in in-depth activity. It consists of additional training activities to those of the study course at which the student is enrolled. Students who are admitted to the EP must have acquired all the credits expected in the first year of the Master's degree program with an average not lower than 27/30.

ORGANISATIONAL SKILLS

Organisational skills

- Open-minded, self-driven, adaptable to work in a multicultural environment
- Good organizational skills favored by the numerous group experiences in the university and extra-university fields

JOB-RELATED SKILLS

Job-related skills

- Good knowledge of software: **Kubernetes, Istio**
- Advanced level in programming languages: **C, C++, JAVA**
- Basic level in programming languages: **Python, SQL, LateX**
- Advanced knowledge of software: **Matlab**
- Basic knowledge of software: **NS3, Openstack, Cisco Packet Tracer, Wireshark**
- Basic knowledge of operating system: **Linux, Windows**

ACADEMIC PROJECTS

Academic Projects

- **Analysis using NS3 software of the congestion control procedures of the TCP versions NewReno and YeAH**

Implementation and simulation through the NS3 software of a LAN connected to a server for the transmission of CBR traffic through a TCP socket. Through NS3 and Wireshark, performance evaluations (throughput) and congestion window trends were made, in the case of single or multiple connections, homogeneous (using the same TCP protocol) or heterogeneous, in the case of a discharged network or in the presence of a bottleneck.

- **Configuration of ISP and LAN networks using Cisco Packet Tracer**

Configuration of the RIPv1, RIPv2 and OSPF routing protocols. Dynamic configuration of hosts in a LAN with DHCP protocol and management of IP addresses via static and dynamic NAT. Network organization in Virtual LAN, and management via VTP and Inter-VLAN Routing. Management of traffic flows through ACLs in Standard, Extended and Named modes.

LANGUAGE SKILLS

Mother tongue(s):

Italian

Other language(s):

English

LISTENING B2 **READING** B2 **WRITING** B2

SPOKEN PRODUCTION B2 **SPOKEN INTERACTION** B2

HOBBIES AND INTERESTS

Hobbies and Interests

- Competitive volleyball since the age of 11, participation in many federal tournaments (FIPAV)
- Volunteering in Germany in an international environment with the voluntary association Youth Action For Peace (YAP), member of the international volunteering network CCIVS
- Coordinator of animation groups for children between three and ten years old, preparation of theatrical performances, collective games and educational activities