

Alessandro Pacini

Curriculum Vitae

Educational Background

2021

PhD in Emerging Digital Technologies,

Telecommunications, Computer Engineering, and Photonics Institute (TeCIP) - Scuola Superiore Sant'Anna, Pisa, Italy

2018

2021

MSc in Computer Science and Networking,

Joint degree from Scuola Superiore Sant'Anna & University of Pisa, Pisa, Italy

2015

2018

BSc in Computer Science,

University of Camerino, Camerino, Italy

Theses

PhD Thesis - Ongoing

TITLE A flexible and modular approach towards Zero Touch Networks

Research focused on finding efficient ways for reusing and migrating current generation of networks to a Zero-Touch paradigm. The basic idea is to extend Software-Defined based scenarios with new functionalities, so that they can be integrated with closed-loop decision frameworks.

ADVISORS Prof. Valcarenghi Luca, Dr. Sgambelluri Andrea
& Dr. Giorgetti Alessio

MSc Thesis

TITLE A scalable and reliable Kafka-based monitoring architecture for Zero Touch Networks

A monitoring architecture has been developed using Apache Kafka to continuously monitor an optical network. By using the publish-subscribe architecture offered by this framework, plug-n-play modules have been designed, able to read and process network monitored data at runtime.

ADVISORS Prof. Valcarenghi Luca & Dr. Sgambelluri Andrea

BSc Thesis

TITLE Comparative study on the energy efficiency of different innovative election models in clustering protocols for heterogeneous WSNs

ADVISORS Prof. Mostarda Leonardo & Dr. Micheletti Matteo

Research Interests

- Zero-Touch Networks
- Closed-loop automation
- Next-generation monitoring techniques
- Distributed and scalable networking architectures

Skills

Programming Python, Java, Javascript

Knowledge Networking stacks, WAN/MAN/LAN architectures, Parallel computing, Distributed systems, Software Defined Networking, Container & Orchestration

Other Skills Communication, Organization, Motivated, Hard-working

Research Projects

PROXIMITY-CARE

October 2021 The project aims to improve socio-health services in the rural areas of the
- Ongoing province of Lucca. I developed a navigable map to identify possible intervention areas by taking into account both current health and connectivity services.,

TeCIP Institute - Scuola Superiore Sant'Anna, Pisa, Italy

Funding agency: Fondazione Cassa di Risparmio di Lucca

BRAINE

January 2021 I have been involved in many WPs where there was the need to extend an
- Ongoing SD-RAN 5G framework with external control loops in high performance distributed scenarios.,

TeCIP Institute - Scuola Superiore Sant'Anna, Pisa, Italy

Funding agency: EU Horizon programme

5G-SOSIA

September 2020 The aim of the project is to exploit 5G capabilities to decrease the first aid
- Ongoing time. I developed an application that connects to smart-band devices and sends patient live data to a data-center for further elaboration.,

TeCIP Institute - Scuola Superiore Sant'Anna, Pisa, Italy

Funding agency: Tuscany region

5GROWTH

January 2021 I have supported the development of a WP where metrics from a 5G testbed
- January 2022 had to be sent over a Kafka bus for forecasting purposes.,

TeCIP Institute - Scuola Superiore Sant'Anna, Pisa, Italy

Funding agency: EU Horizon programme

Extracurricular Internship

- June 2019** Development of a fault detection and localization app for an SDN controller
- July 2019 (ONOS) in optical environment.,
TeCIP Institute - Scuola Superiore Sant'Anna, Pisa, Italy
Advisor: Dr. Giorgetti Alessio

Awards

Best Demo Award

- November 2022** Best Demo Award for the paper: "Enabling event-based hierarchical synchronization in SDN ONOS clusters, Pacini, D. Scano, L. Valcarenghi, A. Sgambelluri and A. Giorgetti",
IEEE NFV-SDN 2022, Chandler, Arizona, USA

Undergraduate Research Scholarship

- September 2021** Research and development of a scalable and fault tolerant data collection
- September 2022 and processing framework to be integrated into a Zero-Touch Network.,
TeCIP Institute - Scuola Superiore Sant'Anna, Pisa, Italy
Advisor: Prof. Valcarenghi Luca

Memberships

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|----------------------|--|---------------------|
| International | IEEE Student Member | <i>October 2022</i> |
| | IEEE Communications Society Student Member | <i>October 2022</i> |

Teaching Experience

- March 2022** Lecture for PhD students in Health Science, Technology and Management,
TeCIP Institute - Scuola Superiore Sant'Anna, Pisa, Italy
- February 2022** Lecture for Seasonal School students about next-gen monitoring platforms,
TeCIP Institute - Scuola Superiore Sant'Anna, Pisa, Italy

Languages

- | | |
|----------------|----------------------------------|
| Italian | Native |
| English | Professional working proficiency |

Event Organization

- March 2022** International Workshop on Telemedicine and E-health Evolution in the New Era of Social Distancing (Telmed), Pisa, Italy

Other Certificates

- May 2021** Confluent Fundamentals Accreditation, *Confluent*
- February 2019** Cisco Certified Network Associate (CCNA 1-2-3-4), *Cisco Systems*
- February 2012** B1 Preliminary in English, *University of Cambridge*

Publications

A. Pacini, D. Scano, L. Valcarenghi, A. Sgambelluri, and A. Giorgetti, “Enabling event-based hierarchical synchronization in sdn onos clusters,” in *2022 IEEE Conference on Network Function Virtualization and Software Defined Networks (NFV-SDN)*, pp. 92–93, 2022.

M. F. Silva, A. Pacini, A. Sgambelluri, F. Paolucci, and L. Valcarenghi, “Confidentiality-preserving machine learning scheme to detect soft-failures in optical communication networks,” in *European Conference on Optical Communication (ECOC) 2022*, p. Tu3B.5, Optica Publishing Group, 2022.

F. Paolucci, A. Sgambelluri, M. F. Silva, A. Pacini, P. Castoldi, L. Valcarenghi, and F. Cugini, “Peer-to-peer disaggregated telemetry for autonomic machine-learning-driven transceiver operation,” *J. Opt. Commun. Netw.*, vol. 14, pp. 606–620, Aug 2022.

M. F. Silva, A. Pacini, A. Sgambelluri, and L. Valcarenghi, “Learning long-and short-term temporal patterns for ml-driven fault management in optical communication networks,” *IEEE Transactions on Network and Service Management*, pp. 1–1, 2022.

M. F. Silva, A. Pacini, A. Sgambelluri, F. Paolucci, and L. Valcarenghi, “Confidentiality-preserving machine learning scheme to detect soft-failures in optical communication networks,” in *European Conference on Optical Communication (ECOC) 2022*, p. Tu3B.5, Optica Publishing Group, 2022.

L. Valcarenghi, A. Pacini, J. Borromeo, S. Fichera, M. Gagliardi, D. Amram, and V. Lionetti, “Managing physical distancing through 5g and accelerated edge cloud,” *IEEE Access*, pp. 1–1, 2022.

M. F. Silva, A. Pacini, A. Sgambelluri, L. Valcarenghi, and F. Paolucci, “Bringing disaggregated telemetry and ml to the transceiver for autonomic signal adaptation,” in *2022 Optical Fiber Communications Conference and Exhibition (OFC)*, pp. 1–3, 2022.

L. Valcarenghi, A. Pacini, A. Sgambelluri, and F. Paolucci, “A scalable telemetry framework for zero touch optical network management,” in *2021 International Conference on Optical Network Design and Modeling (ONDM)*, pp. 1–6, 2021.

L. Valcarenghi, A. Pacini, J. C. Borromeo, S. Fichera, M. Gagliardi, D. Amram, and V. Lionetti, “A framework to support social distancing management based on 5g and accelerated edge cloud,” in *2021 IEEE International Mediterranean Conference on Communications and Networking (MeditCom)*, pp. 94–99, 2021.

A. Pacini, “Connettere innovazione e tradizione nelle aree interne,” in *Next Generation EU. Leggere il PNRR*, Pandora Rivista, 2021.

A. Sgambelluri, A. Pacini, F. Paolucci, P. Castoldi, and L. Valcarenghi, “Reliable and scalable kafka-based framework for optical network telemetry,” *J. Opt. Commun. Netw.*, vol. 13, pp. E42–E52, Oct 2021.

S. Calabrò, R. Gagliardi, F. Marcantoni, M. Micheletti, A. Pacini, and A. Piermarteri, “Tailoring micro-solar systems to heterogeneous wireless sensor networks,” in *Web, Artificial Intelligence and Network Applications* (L. Barolli, M. Takizawa, F. Xhafa, and T. Enokido, eds.), (Cham), pp. 724–733, Springer International Publishing, 2019.