UNIVERSITÀ DI PISA

DIPARTIMENTO DI INGEGNERIA DELL'INFORMAZIONE

Dottorato di Ricerca in Ingegneria dell'Informazione

Doctoral Course

"Multi-access Edge Computing (MEC)"

Prof. Gian Paolo Rossi
Dr. Christian Quadri

Università degli Studi di Milano – Italy
gianpaolo.rossi@unimi.it

Short Abstract: The advent of Multi-access Edge Computing (MEC) is radically transforming the design of network infrastructure and enabling the feasibility and the success of several industrial verticals, including healthcare, IoT, automotive, smart cities, media and entertainment. MEC relies on the flexible use of a pool of shared network and computing resources, which need to be placed at the edge of the network, and on the softwarization of hardware network functions (NFV) to achieve the different and the stringent network requirements.

MEC is today a very hot research topic in networking, it is subject to a strong standardization process, and is at the heart of 5G network, which has been holistically designed with MEC. The course focuses on all these issues organizing the contents according to the sequence briefly described below.

Course Contents in brief:

- Why: analysis of the main industrial verticals requiring and benefiting from a MEC approach. This section will be helpful to an audience with different background in engineering;
- How: comprehensive description of most important ETSI standardization contributions to MEC, mainly focusing on the emerging network architecture and the integration with 5G networks;
- Where should MEC facilities be deployed: analysis of MEC provisioning in terms of flexible resource deployment, which is achieved through Network Function Virtualization, and agile migration of several Virtual Network Functions;
- Case studies: in-depth analysis of realistic scenarios in two industrial verticals (automotive and media gaming) to show how they can leverage on MEC to achieve bandwidth, latency and computing requirements.

Total # of hours of lecture: 18 hours

References:

[1] Shahzadi, S., Iqbal, M., Dagiuklas, T. et al. Multi-access edge computing: open issues, challenges and future perspectives. J Cloud Comp 6, 30 (2017). https://doi.org/10.1186/s13677-017-0097-9

[2] Zeineb Rejiba, Xavier Masip-Bruin, and Eva Marín-Tordera. 2019. A Survey on Mobility-Induced Service Migration in the Fog, Edge, and Related Computing Paradigms. ACM Comput. Surv. 52, 5, Article 90 (October 2019), 33 pages. DOI:https://doi.org/10.1145/3326540

[3] ETSI GS MEC 002: "Multi-access Edge Computing (MEC); Use Cases and Requirements"

CV of the Teachers

Gian Paolo Rossi is Professor of Computer Networks at the Dipartimento di Informatica, Università di Milano, Italy, where he leads the Computer Networks Laboratory (NPTLab, http://nptlab.di.unimi.it). He spent 2 postdoc years at the Joint Research Center of the EC in Ispra, where he participated in the development and the deployment of the first European packet switched network (EIN). He joined the University of Milano in 1980 as an Assistant Professor. From 2000 to 2006, he chaired the Faculty track in Computer Science.

He coauthored almost 100 scientific papers and coordinated/participated in several national and European research projects. His main research focus is on computer networks, including architecture and protocol design, performance evaluations and measuring, modeling and analysis. Today's research interests include mobility management and edge computing.

Christian Quadri is a postdoctoral researcher at the Computer Science Dept. of the University of Milan. His research interests focus on the 5G communication networks and, in particular, on the design and development of new network infrastructures and services by using novel technologies and paradigms such as, SDN, NFV and MEC.

Room and Schedule

Room: *Aula Riunioni del Dipartimento di Ingegneria dell'Informazione, Via G. Caruso 16, Pisa – Ground Floor*

Schedule:

Day1 – June/July 2021

Day2 – June/July 2021

Day3 – June/July 2021

Day4 – June/July 2021