UNIVERSITÀ DEGLI STUDI DI NAPOLI FEDERICO II

DOTTORATO DI RICERCA / PHD PROGRAM IN
INFORMATION TECHNOLOGY AND ELECTRICAL ENGINEERING

Seminar announcement

Friday 20 December 2024, Time: 10:00 - 12:00
Aula Seminari, Floor 1, Building 3/A, DIETI - Via Claudio, 21 - NAPOLI

Prof. Andrea Cervone

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Solid State Transformers: Fundamentals, Insights and New Trends

Abstract: In the evolving energy landscape, the Solid-State Transformer (SST) will play a key role as an efficient and flexible link between new kinds of electrical sources and loads, emerging from renewable energy plants, energy storage systems, charging stations and data centers. SSTs, unlike conventional transformers, make intensive use of power electronics operated at much higher frequency than the AC mains to offer a more efficient, compact, and adaptable solution for managing electrical power. Thanks to the operation at higher frequencies, the size of passive elements, including magnetics and filters, can be greatly reduced. Furthermore, SSTs can offer a flexible control over the transferred power between the primary and secondary side, and they can not only work in AC systems, but also in DC and hybrid AC/DC grids. However, despite the numerous benefits, the SST technology is still not commercially available, and many research activities are still ongoing to improve its efficiency, power density and reliability. This seminar will present the basic topologies and operating principles of SSTs, will provide some application examples from both industry and academia, and will give few insights into the main operational characteristics, challenges and future research direction of this evolving technology.

Lecturer short bio: *Andrea Cervone received his B.Sc., M.Sc., and Ph.D. degrees in Electrical Engineering from the University of Naples Federico II, Italy, in 2014, 2017, and 2021, respectively. His doctoral research focused on the modeling and control of multilevel converters and multiphase electric drives. After completing his Ph.D., he joined the Power Electronics Laboratory (PEL) at EPFL, Switzerland, where he worked as a postdoctoral researcher from 2021 to 2024. There, he contributed to research on Solid-State Transformer technology and power electronics for hybrid AC/DC microgrids.In 2024, he joined the academic staff at KU Leuven, Belgium, where he currently works as an assistant professor in the Department of Electrical Engineering (ESAT).*

For information: Ing. Luigi Pio Di Noia (DIETI, UniNA) – luigipio.dinoia@unina.it *(organizer)* **Attendance at the seminar is in-person. Participants are requested to send an e-mail to Luigi Pio Di Noia by 12 December 2024, with the following information: Student name and surname, name of the PhD course, PhD cycle. In the email, students abroad need to motivate the request for remote attendance, indicating the place and period they are spending in a foreign institution. Once authorized, they must keep the camera on for the entire duration of the seminar (CODE MS TEAMS: 4o8ugcj)**