Πανεπιστήμιο Κύπρου
University of Cyprus

School of Engineering
Department of Electrical and Computer Engineering

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Department of Electrical and Computer Engineering

Title: « Synchronization and Control Methods for Grid-Connecting Renewable Energy Sources»

Lenos Hadjidemetriou
PhD student in the Department of Electrical and Computer Engineering, University of Cyprus

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Abstract:
Renewable Energy Sources (RES) connected to the power grid have now reached significant penetration levels and can affect the power quality and the grid stability of the power system. Therefore, there is a need to advance the controllers for the Grid Side power electronic Converter (GSC) of RES to meet the modern grid codes. According to these regulations, RESs need to enable a high quality current injection under normal and harmonic distorted grid voltage. Moreover, a RES controller must be equipped with Fault Ride Through (FRT) capability to enhance the power system stability by participating in the voltage and frequency support of the power system under grid faults. An advance RES can only be developed by advancing the synchronization method, which is the most crucial unit of the GSC controller. Several new synchronization methods are proposed within this presentation, which can achieve faster dynamic response under low-voltage grid faults and accurate response under harmonic distorted voltage and unbalanced conditions. The dynamic response of the synchronization is a critical aspect regarding the FRT operation of RES and the robustness against harmonics is beneficially affecting the power quality of the RES and consequently of the entire power system.

Biography:
Lenos Hadjidemetriou was born in Nicosia, Cyprus, on August 28, 1985. He received the Diploma in Electrical and Computer Engineering from the National Technical University of Athens, Athens, Greece, in 2010. He is currently working toward the Ph.D. degree in the Department of Electrical and Computer Engineering, University of Cyprus, Nicosia.
Since 2010, he has also been a Researcher with the KIOS Research Center for Intelligent Systems and Networks, University of Cyprus. His research interests include renewable energy systems, grid synchronization methods, fault ride through control, control of wind power systems, control of PV systems, electric vehicles, power systems, power electronics, electric machines, and smart grids.
Mr. Hadjidemetriou is a member of the Cyprus Technical Chamber. He volunteered as a reviewer to several IEEE conferences and transactions and received the best paper award in the session of power quality at IEEE IECON 2013.