Pr. Adel Mellit

BIOGRAPHY

Dr. Adel Mellit is Professor of Electronics at the Faculty of Sciences and Technology, University of Jijel, Algeria. He received his M.S. Degree and PhD in Electronics from the University of Sciences Technologies (USTHB) Algiers in 2002 and 2006 respectively. Research interests of Dr. Adel Mellit focus on the application of the artificial intelligence techniques and internet of things in photovoltaic systems. He has authored and co-authored more than 100 papers in international peer reviewed journals, and papers in conference proceedings mainly on photovoltaic systems and three books. He was the director of RELab (2012-2022). He is an Associate Senior Member at the ICTP, Trieste (Italy). Editor of the IEEE Journal of Photovoltaics, Subject editor of Energy journal and editorial board member of the Renewable Energy journal (Elsevier Ltd).

PLENARY TITLE

"Application of machine learning and deep learning algorithms for fault diagnosis of photovoltaic systems: Recommendations and future directions"

ABSTRACT

The total cumulative installed capacity for photovoltaic (PV) at the end of 2021 reached at least 942 GW, which means that a huge number of PV plants were installed around the world. To keep these plants working effectively and reliably over time and for safety reasons, they should be carefully protected, monitored, and supervised. Faults in any components of PV plants (modules, connection lines, converters, and inverters) can seriously affect the efficiency, energy yield as well as the security and reliability of the entire PV plant, if not detected. In addition, if some faults persist such as arc fault, ground fault, etc they can lead to risk of fire. Recently, monitoring and remote sensing systems playing very important role in fault detection of PV plants. Thus, fault detection and diagnosis methods are indispensable for reliability, efficiency, and safety of PV plants. In this talk, the types and causes of PV systems failures will be presented, then methods proposed in the literature for fault diagnosis of PV systems will be discussed. Special attention will be paid to advanced methods that can accurately detect, and classify possible faults occurring in DC side of PV plants. Some examples on the application of Machine Learning and Deep Learning algorithms in this area will be also presented and discussed. Advantages and limits of methods in terms of feasibility, complexity, cost-effectiveness and generalization capability for large-scale integration will be presented in this talk. The conclusion of the talk will highlight the challenges, trends, and recommendations on the implementation of the fault diagnosis methods in real-time.