

ICRERA2022, September 18–21, 2022

### Keynote speaker

Professor Adel Nasiri University of South Carolina, USA

### Title

Efficient Medium Voltage Solar PV Inverter

**Abstract:** As the cost of solar PV cells have reduced at a rapid pace in the last decade, currently inverter, balance of the system, and installation account for 44% of solar PV system total cost. This is a major area of improvement to further reduce the installed cost. Some of the target components cost reduction are medium voltage transformer, low voltage bus duct, materials, and installation. An ongoing project is described in this keynote speech that aims to connect low voltage solar PV systems (700-1500VDC) directly to 13kVAC grid. The project uses a resonant front end to improve efficiency and also to provide voltage step up/down functions. A medium voltage high frequency provides galvanic isolation required for large solar PV installations. A grid-side inverter circuitry with virtually zero switching loss connects the system to grid. The design and implementation process for the converter is discussed in this talk. In addition, control software and hardware methods and elements are described. The converter size, cost, and results are compared with a benchmark 1MW system.

**Bio:** Adel Nasiri, Fellow IEEE, received B.S. and M.S. degrees from Sharif University of Technology, Tehran, Iran, in 1996 and 1998, respectively, and the PhD degree from Illinois Institute of Technology, Chicago, Illinois, in 2004, all in electrical engineering.

He is presently a Distinguished Professor in the Electrical Engineering Department at the University of South Carolina. His research interests are smart and connected energy systems, energy storage, and microgrids. Previously, he worked at the University of Wisconsin-Milwaukee (UWM) from 2005 to 2021 and served in various roles including professor of electrical engineering, founding and Interim Executive Director, Connected Systems Institute (CSI) and Director, Center for Sustainable Electrical Energy, and the site director for the NSF center on Grid-connected Advanced Power Electronic Systems (GRAPES). He has published numerous technical journal and conference papers and co-authored two books on related topics. He also holds seven patent disclosures.

Dr. Nasiri is the past chair of IEEE Industry Applications Society (IAS) Committee on renewable and sustainable energy conversion. He is also an Editor of Power Components and Systems, and Associate Editor of the International Journal of Power Electronics and was an Editor of IEEE Transactions on Smart Grid (2013-2019) and paper review chair for IAS (2018-2019). He was the general Chair of 2012 IEEE Symposium on Sensorless Electric Drives, 2014 International Conference on Renewable Energy Research and Applications (ICRERA 2014), and 2014 IEEE Power Electronics and Machines for Wind and Water Applications (PEMWA 2014).