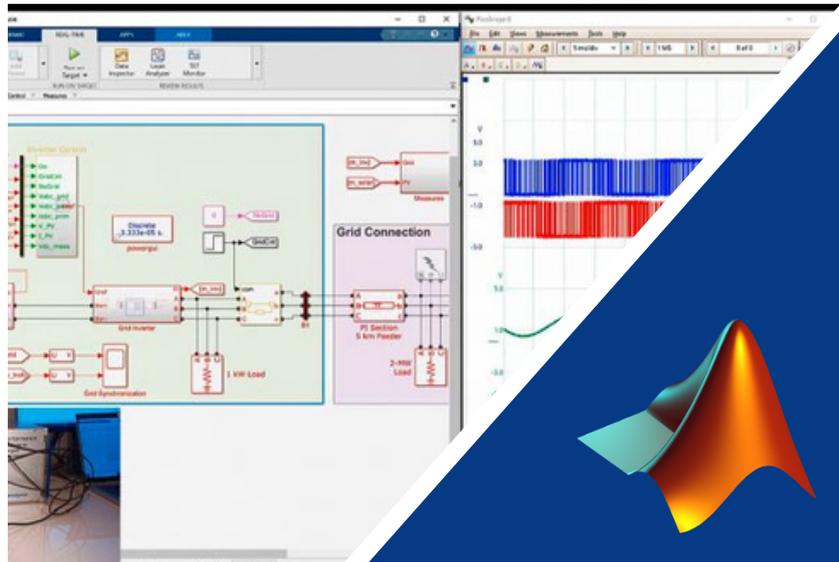


**Live Event**

# Implementing and Real-Time Testing a Controller for a Grid-Tied Inverter

in Collaboration with



**When**

19 May 2021

10:00am-11:00am SGT

**Venue**

Online via Webex

**Organised By**

IEEE PES Chapter SG  
MathWorks  
TechSource Systems

## About the Event

### Implementing and Real-time Testing a Controller for a Grid-Tied Inverter by *MathWorks*

Learn how you can **design, implement, and test** the controller code for a 3-phase grid-tied solar inverter using Simulink. The goal is to develop a controller that can adhere to grid codes and maintain inverter grid connection during upset conditions. We begin by modeling the **photovoltaic (PV) system, solar inverter, and grid load with Simulink and Simscape Electrical**.

This model is used to design and tune closed-loop and supervisory control algorithms for maximum power point tracking (MPPT), grid synchronization, and low voltage ride through (LVRT). With Embedded Coder, the control algorithms are used to generate and deploy optimized C code to a Texas Instruments C2000 Piccolo™ MCU. Finally, the implemented code is tested for a variety of emulated grid fault scenarios using a **hardware-in-the-loop (HIL) simulation** of the **PV system, inverter, and grid load** running on a **Speedgoat real-time target** machine using **Simulink Real-Time**.



**Presenter**

**Jonathan LeSage**

Senior Application Engineer  
MathWorks



**Presenter**

**Dr. Xu Yan**

Chapter Chair  
IEEE PES Chapter SG

**Organizers:**



**MathWorks®** TECHSOURCE

# Coordinated Control of Distributed Energy Resources (DERs) in Microgrids by *Chairman IEEE, PES, Singapore,*

**Microgrid** is an effective solution to integrate **distributed energy resources (DERs)** including distributed generators, energy storage units, flexible loads, combined cooling and heating units, etc. In Singapore, the Nanyang Technological University (NTU) is building a networked-microgrid system Renewable Energy Integration Demonstrator for Singapore (REIDS) in Semakau Island, where multiple sub-microgrids are owned by different industry partners.

This webinar will firstly introduce the REIDS project, and then present a series of methods for coordinated control of the DERs to maintain frequency and voltage under islanded mode and provide frequency and voltage support under grid-connected mode. A cross-national (Singapore, UK, and France) hardware-in-the-loop (HIL) testbed has been developed for validation of the methods.

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## Presenters

### **Jonathan LeSage, Senior Application Engineer, *MathWorks***

Jonathan LeSage is a Senior Application Engineer and Senior Team Lead specializing in the Energy Production and Industrial Automation industries and has been with the MathWorks since 2013. His focus at the MathWorks is on building models of multi-physics systems and then leveraging them for control design, hardware-in-the-loop testing and embedded code generation. Jonathan holds a B.S. and a Ph.D from the University of Texas at Austin specializing in power systems, controls, and machine learning. Prior to MathWorks, Jonathan worked at an oil field services company on downhole tools and at Applied Research Labs on microgrids and ship electrification.

### **Dr. Xu Yan, Associate Professor | *Nanyang Technological University, Singapore* | *Chairman IEEE Power & Energy Society Singapore Chapter***

Yan Xu received the B.E. and M.E degrees from South China University of Technology, Guangzhou, China in 2008 and 2011, respectively, and the Ph.D. degree from The University of Newcastle, Australia, in 2013. He conducted postdoctoral research with the University of Sydney Postdoctoral Fellowship, and then joined Nanyang Technological University (NTU) with The Nanyang Assistant Professorship. He is now an Associate Professor at School of Electrical and Electronic Engineering and a Cluster Director (Smart Grid and Microgrid) at Energy Research Institute @ NTU (ERI@N). His research interests include power system stability and control, microgrid, and data-analytics for smart grid applications. Dr. Xu is an Editor for IEEE Transactions (TSG and TPWRS), IET Journals (GTD and ECE), and China's power engineering international journals (CSEE JPES and MPCE). He is also serving as the Chairman for IEEE Power & Energy Society Singapore Chapter



Register at <https://event.techsource-asia.com/mw-event-implementing-and-real-time-testing-a-controller-for-a-grid-tied-inverter>

**Organizers:**

