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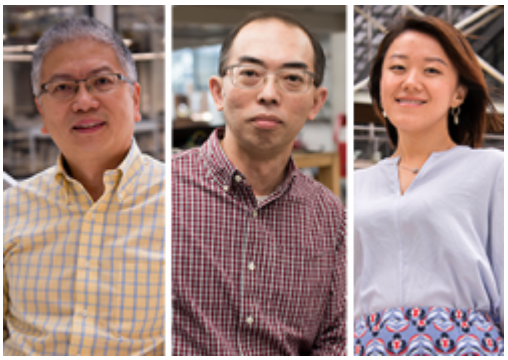
[1]

Related Faculty:
Alex Q. Huang [2]

Wednesday, April 17, 2019

The United States Department of Energy (US DOE) recently announced an investment of $36 Million in a number of projects to improve situational awareness of solar energy systems, especially at critical infrastructure sites. This investment will increase resilience to cyber and physical threats, and strengthen solar integration on the grid.

Dr. Alex Huang [3] and his colleagues Drs. Surya Santoso [4] and Hao Zhu [5] of Texas ECE are part of the Solar Critical Infrastructure Energization (SOLACE) System project led by EPRI. The SOLACE project will develop a comprehensive resilience approach to high penetration solar based power grid. The project includes pre-planning analysis technique, using new communications standards and advanced inverters, to determine how to methodically supply power to critical infrastructure with any resource available on the grid.

More specifically, The UT Austin team will develop and validate a next generation grid forming PV inverter. Grid forming inverters are designed and controlled differently from today?s grid following inverters. The goal is to improve the resiliency of the power system with high solar energy penetration. A recently example that highlights the problem of today?s grid following inverters is the August 16, 2016 Blue Cut fire in California, which causes the loss of nearly 1,200 MW of solar generation because the grid following solar inverters tripped offline due to frequency and voltage disturbances following the faults on 500 kV grid. The next generation PV inverter, called PV Synchronous Generator or PVSG, will operate the PV system like a traditional synchronous generator. By design, the PVSG will ride through the voltage and frequency disturbances. During these events the PVSG provides inertia and reactive power to bring the system frequency and voltage back to stable operation. The PVSG also offers back start capability, allowing PV energy system to generate power without the existence of a main grid.

Other SOLACE partners include Solectria, Austin Energy, Duke Energy, Schneider, National Renewable Energy Laboratory (NREL), Sandia National Laboratories and Pecan Street.

The University of Texas at Austin
Electrical and Computer Engineering
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Links
[1] http://www.mrc.utexas.edu/sites/mrc.utexas.edu/files/images/news/powergrid.png
[2] http://www.mrc.utexas.edu/people/faculty/alex-q-huang
[3] http://www.ece.utexas.edu/people/faculty/alex-q-huang
[4] http://www.ece.utexas.edu/people/faculty/surya-santoso
[5] https://www.ece.utexas.edu/people/faculty/hao-zhu