



2023 PSERC Summer Tutorial

Design and Simulation of Power Electronics for Solar PV Applications

Mike Ranjram

Arizona State University

This online tutorial Solar photovoltaic (PV) power generation is essential to the widespread integration of renewable energy into the grid. In this tutorial, we will explore the fundamentals of developing power electronic converters for solar PV applications. This includes: an overview of solar energy, understanding a solar PV panel datasheet and extracting a circuit model from it, an introduction to power conversion and its use in solar PV systems, and an overview of grid-interfaced solar PV converters. The tutorial includes simulations in MATLAB and LTSPICE which will be distributed to attendees. At the end of the tutorial, attendees will have a good understanding of the fundamentals of solar PV panels, and the essential role power electronics play in enabling their widespread use. This tutorial is built from content developed and presented at the 2022 PSERC Summer School.

AUGUST 9, 2023

[REGISTRATION](#)

12:00 – 1:30 P.M. CT

(10:00 - 12:30 P.M. PT)

Mike K. Ranjram is an Assistant Professor in Electrical, Computer, and Energy Engineering at Arizona State University. He received the B.A.Sc. And M.A.Sc. Degrees in electrical engineering from the University of Toronto in 2013 and 2015, respectively, and the Ph. D. degree from the Massachusetts Institute of Technology in 2021. His main research interest is in making power electronics smaller, more efficient, and more capable, and in leveraging these improvements to enable the next generation of sustainable systems and devices. A current focus is on high-frequency power conversion and on techniques for reducing the cost, volume, weight, and loss of power magnetic components.

He is a recipient of the IEEE Transactions on Power Electronics Prize Paper Award.

