

# Advanced Control of Grid-Integrated Renewable Energy Power Plants

LMI-Based Design in the Takagi-Sugeno Framework

Presents the principles, derivations, and equations of renewable energy power plants, including MATLAB code. Advanced Control of Grid-Integrated Renewable Energy Power Plants presents a comprehensive introduction to the power system dynamics and stability of renewable energy power plants (RPPs), such as wind turbines, wind power plants, and photovoltaic systems. The author--a noted expert on the topic--takes a rigorous approach to the analysis and modelling of RPPs, such as turbine rotors, PV cells, electronic converters, transformers, and aggregated grid models. This approach allows for the validation of requirements for sustainable power systems based on formal methods. The text deals with nonlinear model-based observer and control design techniques in the Takagi-Sugeno (TS) framework. It explores the Takagi-Sugeno fuzzy (TSF) models which are nonlinear systems, in which the consequent part of a fuzzy rule is a mathematical formula, representing local dynamics or limited nonlinearities by sector functions. The strong property of the TSF finds several applications modelling dynamical systems that can be described by differential equations. The book's practical exercises use MATLAB code to help model simulation models of single large-scale wind turbines, wind farms, and photovoltaic plants. This important book: \* Provides a complete introduction to the power system dynamics and stability of renewable energy power plants \* Includes a detailed discussion of how to design model-based controllers for RPPs \* Takes a rigorous approach to the analysis and modelling of RPPs, including turbine rotors, PV cells, electronic converters, transformers, aggregated grid models, and more \* Includes MATLAB code to model simulation models of single large-scale wind turbines, wind farms, and photovoltaic plants Written for students and researchers of renewable energy, Advanced Control of Grid-Integrated Renewable Energy Power Plants offers an authoritative text to the topic.

**124,50 €**

116,36 € (zzgl. MwSt.)

Lieferfrist: bis zu 10 Tage

**Artikelnummer:** 9781119701392

**Medium:** Buch

**ISBN:** 978-1-119-70139-2

**Verlag:** Wiley

**Erscheinungstermin:** 17.06.2024

**Sprache(n):** Englisch

**Auflage:** 1. Auflage 2024

**Serie:** Wiley - IEEE

**Produktform:** Gebunden

**Gewicht:** 553 g

**Seiten:** 288

**Format (B x H):** 152 x 229 mm

