



PID and Predictive Control of Electrical Drives and Power Converters using MATLAB / Simulink (IEEE Press Series on Power Engineering)

By Liuping Wang, Shan Chai, Dae Yoo, Lu Gan, Ki Ng

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A timely introduction to current research on PID and predictive control by one of the leading authors on the subject

PID and Predictive Control of Electric Drives and Power Supplies using MATLAB/Simulink examines the classical control system strategies, such as PID control, feed-forward control and cascade control, which are widely used in current practice. The authors share their experiences in actual design and implementation of the control systems on laboratory test-beds, taking the reader from the fundamentals through to more sophisticated design and analysis. The book contains sections on closed-loop performance analysis in both frequency domain and time domain, presented to help the designer in selection of controller parameters and validation of the control system. Continuous-time model predictive control systems are designed for the drives and power supplies, and operational constraints are imposed in the design. Discrete-time model predictive control systems are designed based on the discretization of the physical models, which will appeal to readers who are more familiar with sampled-data control system. Soft sensors and observers will be discussed for low cost implementation. Resonant control of the electric drives and power supply will be discussed to deal with the problems of bias in sensors and unbalanced three phase AC currents.

- Brings together both classical control systems and predictive control systems in a logical style from introductory through to advanced levels
- Demonstrates how simulation and experimental results are used to support theoretical analysis and the proposed design algorithms
- MATLAB and Simulink tutorials are given in each chapter to show the readers how to take the theory to applications.
- Includes MATLAB and Simulink software using xPC Target for teaching purposes

- A companion website is available

Researchers and industrial engineers; and graduate students on electrical engineering courses will find this a valuable resource.

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Editorial Review

From the Back Cover

Electrical drives play a critical role in electromechanical energy conversions. They are the fundamental building blocks in manufacturing, transportation, mineral processing, wind energy and many other industries.

This book presents methods for design and implementation of PID and predictive control of electrical drives and grid connected three phase power converters with emphasis on meeting operational constraints while optimizing performance. The authors share their experiences in actual design and implementation of the control systems on laboratory test-beds, taking readers from the fundamentals through to the sophisticated design and analysis.

- Brings together both classical control systems and predictive control systems in a logical style from introductory through to advanced levels
- Demonstrates how simulation and experimental results are used to support theoretical analysis and the proposed design algorithms
- Gives MATLAB and Simulink tutorials to show the readers how to apply theoretical concepts
- Includes MATLAB and Simulink software for teaching purposes
- A companion website with Simulink/MATLAB and xPC Target Programs is available

PID and Predictive Control of Electrical Drives and Power Converters using MATLAB/Simulink is an excellent resource for researchers and industrial engineers, as well as graduate students and senior undergraduates on electrical engineering courses.

About the Author

Liuping Wang is Professor of Control Engineering at RMIT University, Melbourne, Australia. She has been working on PID control systems and system identification for over 20 years and, together with her research group, Professor Wang has generated the research outcomes that have significantly improved the performance of computer numerical control (CNC) machines, leading to a new understanding of electric motor control and regenerative power supplies. She has published numerous articles on the subject.

Shan Chai, Dae Yoo, Lu Gan and **Ki Ng** are PhD students working under the supervision of Professor Wang and are part of the research team that has produced, and is producing, new approaches and new understanding of the electrical motor control and the control of regenerative power supplies.

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Dorothy Whisler:

Why don't make it to become your habit? Right now, try to prepare your time to do the important work, like looking for your favorite publication and reading a reserve. Beside you can solve your short lived problem;

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Mark Blanding:

Is it you actually who having spare time in that case spend it whole day simply by watching television programs or just telling lies on the bed? Do you need something new? This PID and Predictive Control of Electrical Drives and Power Converters using MATLAB / Simulink (IEEE Press Series on Power Engineering) can be the reply, oh how comes? A book you know. You are consequently out of date, spending your time by reading in this brand-new era is common not a geek activity. So what these guides have than the others?

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As we know that book is vital thing to add our know-how for everything. By a publication we can know everything we want. A book is a list of written, printed, illustrated or blank sheet. Every year seemed to be exactly added. This guide PID and Predictive Control of Electrical Drives and Power Converters using MATLAB / Simulink (IEEE Press Series on Power Engineering) was filled in relation to science. Spend your extra time to add your knowledge about your research competence. Some people has several feel when they reading a new book. If you know how big advantage of a book, you can truly feel enjoy to read a book. In the modern era like now, many ways to get book which you wanted.

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