



# Control of Electric Machine Drive Systems

*Seung-Ki Sul*

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**Control of Electric Machine Drive Systems** Seung-Ki Sul

**A unique approach to sensorless control and regulator design of electric drives**

Based on the author's vast industry experience and collaborative works with other industries, *Control of Electric Machine Drive Systems* is packed with tested, implemented, and verified ideas that engineers can apply to everyday problems in the field. Originally published in Korean as a textbook, this highly practical updated version features the latest information on the control of electric machines and apparatus, as well as a new chapter on sensorless control of AC machines, a topic not covered in any other publication.

The book begins by explaining the features of the electric drive system and trends of development in related technologies, as well as the basic structure and operation principles of the electric machine. It also addresses steady state characteristics and control of the machines and the transformation of physical variables of AC machines using reference frame theory in order to provide a proper foundation for the material.

The heart of the book reviews several control algorithms of electric machines and power converters, explaining active damping and how to regulate current, speed, and position in a feedback manner. Seung-Ki Sul introduces tricks to enhance the control performance of the electric machines, and the algorithm to detect the phase angle of an AC source and to control DC link voltages of power converters. Topics also covered are:

- Vector control
- Control algorithms for position/speed sensorless drive of AC machines
- Methods for identifying the parameters of electric machines and power converters
- The matrix algebra to model a three-phase AC machine in d-q-n axes

Every chapter features exercise problems drawn from actual industry experience. The book also includes more than 300 figures and offers access to an FTP site, which provides MATLAB programs for selected problems. The book's practicality and realworld relatability make it an invaluable resource for professionals and engineers involved in the research and development of electric machine drive business, industrial drive designers, and senior undergraduate and graduate students.

**To obtain instructor materials please send an email to [pressbooks@iee.org](mailto:pressbooks@iee.org)**

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