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Electrical Power and Artificial Intelligence

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Electrical Power and Artificial Intelligence represent one of the fastest-evolving frontiers in modern engineering. Intelligent algorithms, autonomous systems, and advanced electrical technologies are reshaping industries ranging from energy, transportation, and manufacturing to healthcare, safety, and environmental sustainability.

This book explores the foundations of electrical power engineering alongside the growing role of artificial intelligence in power systems, devices, and intelligent energy applications. Rather than attempting an exhaustive treatment of the discipline, it provides a carefully selected introduction to emerging areas that demonstrate how rapidly the field is expanding and diversifying.

Topics include AI-driven control of electrical machines, intelligent wind energy systems, green energy technologies, sensorless motor control, electric and autonomous vehicles, optimization of energy storage systems, intelligent buildings, lightning protection, and smart electrical infrastructure. Special attention is given to practical engineering applications that connect theory with current industrial and research challenges.

Designed for postgraduate engineering students, researchers, and practicing professionals, this book serves both as an introduction to new developments and as a valuable refresher on the principles and frontiers of electrical power engineering. Through real-world examples and multidisciplinary perspectives, it highlights the growing influence of electrical, computer, and AI engineering in shaping the technologies of the future.

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