IEEE Educational Videos on
Power Electronics

Introduction to AI in Power Electronics

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Abstract:

This video introduces the transformative role of Artificial Intelligence (AI) in power electronics design. This episode outlines the vision of AI as a co-designer, not a replacement, empowering engineers to navigate the complex, nonlinear design space of converters more efficiently and creatively.

Through the scope of designing a flyback converter, the episode contrasts traditional, iterative engineering workflows with a generative AI-driven paradigm enabled by tools like PE-GPT. Viewers witness how natural language prompts can generate complete converter designs, simulate circuit behavior, and guide intelligent component selection.

The episode also previews the full PELSTube series, covering meta-heuristic optimization, machine learning-based modeling, reinforcement learning for adaptive control, and physics-informed ML. Expert insights from leading researchers highlight cutting-edge applications of AI across magnetic design, power module layout, and design automation.

Keywords:

Artificial Intelligence, Design Automation, Power Electronics