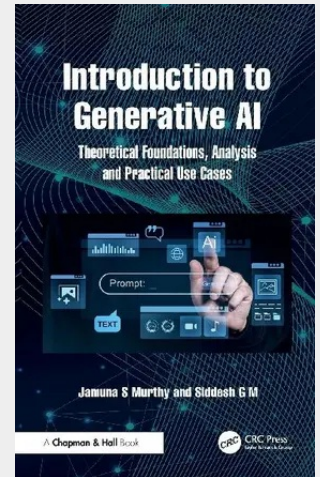


Introduction to Generative AI

Theoretical Foundations, Analysis and Practical Use Cases

Introduction to Generative AI: Theoretical Foundations, Analysis and Practical Use Cases
Generative Artificial Intelligence is reshaping how we create, learn, and imagine. This book offers a clear and complete journey through the science and art behind this revolution — from how machines learn to produce text, images, and music, to how they are being built, tested, and applied in the real world. The first part of the book lays out the ideas that make generative AI possible — neural networks, transformers, diffusion models, and the mysterious “latent spaces” where creativity meets computation. The middle chapters explore how today’s AI systems reason, plan, and use tools, drawing on powerful frameworks such as LangChain, LangGraph, and AutoGen. The final section moves beyond algorithms, discussing how to build safe, fair, and energy-conscious AI that serves human goals rather than replacing them. Throughout, real-world examples bring the technology to life — from language models that write poetry, to multimodal systems that can paint or compose music, to intelligent agents that collaborate with humans in research, education, and design. Written in accessible language and supported by visual explanations, this book bridges deep technical ideas with human-centered understanding. Highlights - Explains the core principles of how generative models think and create - Shows how AI systems combine text, vision, and sound in unified ways - Connects theory with hands-on applications and real-world use cases - Discusses ethics, creativity, and sustainability in the age of intelligent machines - Written for learners, researchers, and professionals who want both clarity and depth Introduction to Generative AI: Theoretical Foundations, Analysis and Practical Use Cases is an essential guide for anyone curious about how artificial intelligence is shaping the next chapter of human innovation.

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