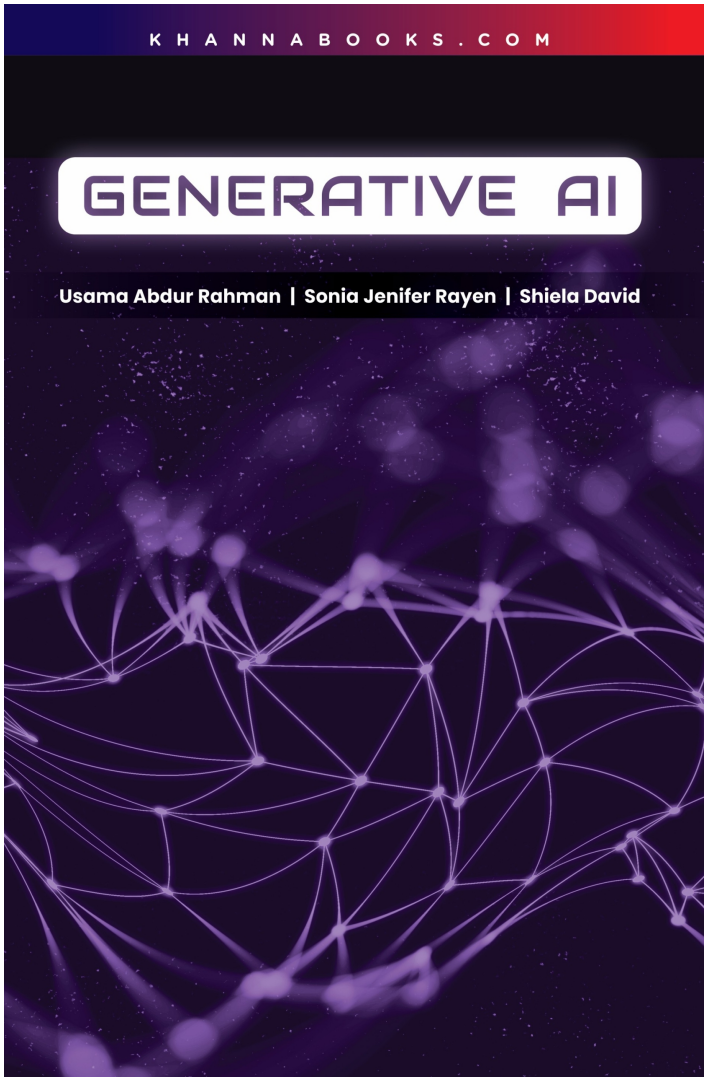

Generative AI

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Product Description

Generative AI (Gen AI) has rapidly evolved from a theoretical concept into a transformative technology capable of simulating human creativity, generating content, producing innovative ideas, and enabling autonomous decision-making. This book serves as a comprehensive and structured guide to understanding the foundations, architectures, applications, and future directions of Generative Artificial Intelligence. Designed for students, researchers, professionals, and technology enthusiasts, it provides both theoretical insights and practical perspectives on one of the most influential fields in modern computing.

The text begins by tracing the historical evolution of Artificial Intelligence, highlighting key milestones that shaped the development of machine learning and intelligent systems. It then builds a strong conceptual foundation by introducing Neural Networks and the revolutionary Transformer Architecture, which forms the backbone of modern generative systems. Special emphasis is placed on the Attention Mechanism, encoder-decoder architectures, and the emergence of Large Language Models (LLMs) that power advanced conversational and content-generation systems.

Beyond foundational concepts, the book explores advanced generative techniques such as Generative Adversarial Networks (GANs) and Variational Autoencoders (VAEs), explaining their architectures, workflows, and practical applications. Readers gain insights into how generative models create realistic text, images, and multimedia content, while also understanding the principles behind AI Agents, prompt engineering, and modern AI development frameworks.

The practical relevance of Generative AI is demonstrated through extensive real-world applications across healthcare, finance, manufacturing, software engineering, media, and entertainment. The text also addresses critical contemporary topics including model evaluation metrics, ethical considerations, responsible AI development, and emerging innovations such as Quantum AI and Neuromorphic Computing. By combining academic rigor with practical implementation, this book provides a complete roadmap for mastering the rapidly evolving landscape of Generative Artificial Intelligence.

Salient Features:

- Foundational AI Concepts: Provides a detailed overview of the history and evolution of Artificial Intelligence, establishing a strong foundation in neural networks, machine learning, and the development of generative technologies.
- Transformer Architecture Deep Dive: Thoroughly explains Transformer Models, the Attention Mechanism, and the distinctions between

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