THE INTELLIGENT CONVERGENCE:
IoT Meets Generative AI for a Smarter Future

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FOREWORD

One of the most significant technological developments of our time is the combination of the Internet of Things (IoT) and generative artificial intelligence. The integration of intelligent, generative capabilities is redefining how data is perceived, processed, and acted upon as connected devices continue to proliferate across industries like healthcare, manufacturing, energy, retail, and smart cities. The Intelligent Convergence: IoT Meets Generative AI for a Smarter Future is an edited volume that comes at a critical time when there is a greater need than ever for intelligent, sustainable, and autonomous systems

This book offers a thorough examination of how IoT systems that are enhanced with generative AI go beyond conventional automation to provide context-aware services, predictive intelligence, and adaptive decision-making. This volume's chapters, which cover a wide range of modern applications such as smart wearable's, personalized diagnostics, supply chain optimization, fraud detection, energy efficiency, and human-robot collaboration, highlight both theoretical underpinnings and practical implementations. The contributions interdisciplinary character reflects the complexity of intelligent systems in the real world and the need for cross-domain innovation.

This book's emphasis on sustainability and optimization is one of its strongest points. The contributors highlight solutions that are not only clever but also socially and environmentally responsible by addressing energy-efficient IoT architectures, intelligent data processing, and responsible AI deployment. By enabling systems that can produce insights, designs, simulations, and responses instead of just responding to predefined rules, the conversations surrounding generative AI further broaden the scope of conventional IoT analytics.

Researchers, academics, business professionals, and graduate students who want to comprehend and contribute to the changing landscape of intelligent IoT ecosystems will find this volume to be an invaluable resource. The editors have effectively brought together a variety of viewpoints that together advance knowledge at the nexus of generative AI and IoT.

I have no doubt that this book will stimulate additional study, encourage creativity, and act as a guide for upcoming advancements in intelligent, networked systems. I applaud the editors and contributors for their commitment and academic work in creating this important and timely work.

Professor Kevin Wilett
Professor
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FOREWORD

The rapid advancement of the Internet of Things (IoT) combined with recent progress in generative artificial intelligence is reshaping the design and operation of intelligent digital systems. As connected devices become increasingly embedded in healthcare, industry, retail, and smart environments, the need for systems that can reason, adapt, and generate informed responses has become critical. This edited volume addresses this evolving technological landscape by examining how the convergence of IoT and generative AI enables smarter, more autonomous, and context-aware solutions across multiple domains.

The book brings together scholarly contributions that explore a broad range of sub-themes, including intelligent wearable systems and personalized healthcare, AI-driven diagnostics and drug discovery, smart retail analytics, fraud detection, financial forecasting, and AI-powered supply chain optimization. Additional chapters focus on generative design in manufacturing, energy-aware intelligent systems, and human–robot collaboration within IoT-enabled environments. By integrating theoretical foundations with practical case studies, the volume provides insights into how generative intelligence enhances data interpretation, decision-making, and system optimization in real-world applications.

This work is intended for researchers, academicians, industry practitioners, and postgraduate students seeking a comprehensive understanding of emerging IoT–AI ecosystems. The editors have curated contributions that reflect interdisciplinary perspectives and contemporary research challenges, ensuring both academic rigor and practical relevance. It is anticipated that this volume will support future research, encourage innovation, and contribute meaningfully to the advancement of intelligent, AI-enabled IoT systems.

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PREFACE

The rapid advancement of digital technologies has led to a new era where intelligent systems are no longer isolated but interconnected and adaptive. Among these developments, the integration of the Internet of Things (IoT) with Generative Artificial Intelligence has emerged as a powerful paradigm, enabling systems that are not only data-driven but also capable of reasoning, learning, and generating actionable intelligence. This book, ***The Intelligent Convergence: IoT Meets Generative AI for a Smarter Future***, is an effort to capture and present this evolving technological landscape.

The primary objective of this volume is to explore how Generative AI enhances IoT ecosystems by enabling intelligent automation, predictive decision-making, and optimized resource utilization. The chapters included in this book address both foundational concepts and practical applications across diverse domains such as healthcare, smart wearables, energy optimization, manufacturing, retail analytics, fraud detection and human–robot collaboration. Each contribution reflects current research trends while highlighting real-world relevance and implementation challenges.

A key focus of this book is sustainability and efficiency in intelligent systems. By emphasizing energy-aware designs, responsible AI practices, and optimized IoT architectures, the book aligns technological innovation with global sustainability goals. The interdisciplinary nature of the chapters encourages collaboration between researchers, academicians, and industry professionals working at the intersection of IoT and Artificial Intelligence.

This edited volume is intended for researchers, postgraduate students, educators, and practitioners seeking insights into next-generation intelligent systems. We hope that the ideas, methodologies, and case studies presented here will inspire further research and innovation in building smarter, sustainable, and human-centric technological solutions.

The editors sincerely acknowledge the contributions of all authors and reviewers whose efforts have made this publication possible.

Dr. Priyanka Verma
Dr. Sumit Kumar Kapoor
Dr. Anubha Jain
Dr. Salini Suresh

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