
Artificial Intelligence in Industrial IoT: Technologies, Applications, and Future Trend

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ISBN : 978-81-998132-0-5



Published By

Essay Publication Research And Consultancy
Chennai, Tamilnadu, India

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Book Title : Artificial Intelligence in Industrial IoT: Technologies, Applications, and Future Trend

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ISBN 978-81-998132-0-5



9 788199 813205

Price : INR 999/-

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PREFACE

*The convergence of **Artificial Intelligence (AI)** and the **Industrial Internet of Things (IIoT)** marks a defining moment in the evolution of modern industry. As organizations across manufacturing, energy, logistics, healthcare, and smart infrastructure strive for greater efficiency, agility, and sustainability, the fusion of intelligent algorithms with interconnected devices has emerged as a powerful catalyst for transformation. This book, *Artificial Intelligence in Industrial IoT: Technologies, Applications, and Future Trends*, is designed to explore this dynamic intersection and provide a comprehensive understanding of how AI is reshaping industrial ecosystems.*

Industrial IoT has enabled the seamless integration of sensors, machines, and systems, generating vast volumes of real-time data. However, the true value of this data can only be unlocked through intelligent analysis and decision-making. This is where AI plays a pivotal role—bringing capabilities such as predictive analytics, machine learning, computer vision, and natural language processing into industrial environments. Together, AI and IIoT are enabling smarter factories, autonomous operations, predictive maintenance, and data-driven optimization across the value chain.

This book aims to serve as a bridge between theory and practice. It presents foundational concepts, enabling technologies, and architectural frameworks that underpin AI-driven IIoT systems, while also highlighting real-world applications across diverse industries. From smart manufacturing and Industry 4.0 to energy management, supply chain optimization, and healthcare automation, readers will gain insights into how organizations are leveraging these technologies to achieve operational excellence and competitive advantage.

In addition to current applications, this volume delves into emerging trends that will shape the future of industrial intelligence. Topics such as edge AI, digital twins, 5G-enabled connectivity, autonomous systems, and sustainable AIoT solutions are explored to provide a forward-looking perspective. The book also addresses critical challenges, including cybersecurity, data privacy, interoperability, ethical considerations, and the need for robust governance frameworks.

This work is intended for a broad audience, including researchers, academicians, industry professionals, policymakers, and students who are interested in understanding and applying AI in industrial contexts. Whether you are developing intelligent systems, managing industrial operations, or studying the evolution of digital transformation, this book offers valuable insights and practical knowledge.

The journey of integrating AI with IIoT is still unfolding, and its full potential is yet to be realized. As industries continue to innovate and adapt, the need for interdisciplinary collaboration and responsible technology adoption becomes increasingly important. It is our hope that this book will contribute to advancing knowledge, inspiring innovation, and supporting the development of intelligent, resilient, and sustainable industrial systems for the future.

TABLE OF CONTENT

Chapter 1: Introduction to Industrial IoT (IIoT)	1
• Evolution from IoT to IIoT	4
• Key components: sensors, actuators, gateways	10
• IIoT architecture and ecosystem	13
• Role in Industry 4.0	18
Chapter 2: Fundamentals of Artificial Intelligence	22
• AI concepts and history	25
• Machine Learning and Deep Learning basics	30
• AI techniques used in industrial systems	34
• Data-driven decision making	38
Chapter 3: AIoT Architecture and System Integration	43
• Integration of AI with IIoT	45
• Data pipelines and workflows	50
• Edge, fog, and cloud computing	53
• System design considerations	57
Chapter 4: Industrial Data Management and Analytics	62
• Data collection and preprocessing	65
• Big data in IIoT	70
• Real-time analytics and visualization	74
• Industrial data platforms	79
Chapter 5: Machine Learning and Deep Learning in IIoT	84
• Predictive analytics models	87
• Time-series forecasting	90
• Computer vision in industry	95
• AI model deployment	99

Chapter 6: Edge AI and Cloud Computing	103
• Edge intelligence and processing	105
• Cloud-based AI platforms	109
• Latency and performance optimization	114
• Hybrid architectures	118
Chapter 7: Smart Manufacturing and Automation	123
• Industry 4.0 technologies	125
• Robotics and intelligent automation	129
• Digital transformation in manufacturing	132
• Smart factory concepts	136
Chapter 8: Predictive Maintenance and Digital Twins	140
• Condition monitoring systems	142
• Failure prediction techniques	145
• Digital twin models and applications	149
• Case studies	152
Chapter 9: Security, Privacy, and Ethical Issues	157
• Cybersecurity in IIoT	159
• Data privacy challenges	163
• Ethical AI in industrial environments	166
• Regulatory considerations	169
Chapter 10: Future Trends and Research Directions	171
• Industry 5.0 and human-centric AI	173
• Autonomous industrial systems	178
• Sustainable and green AIoT	181
• Open challenges and future research	184