

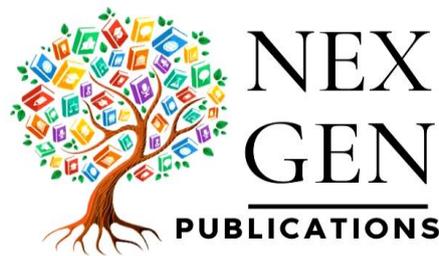
Artificial Intelligence and Cloud Computing:

Foundations and Applications



Dr. Biru Rajak

Artificial Intelligence and Cloud Computing: Foundations and Applications



**India | UAE | Nigeria | Uzbekistan | Montenegro | Iraq |
Egypt | Thailand | Uganda | Philippines | Indonesia**
www.nexgenpublication.com

Artificial Intelligence and Cloud Computing: Foundations and Applications

Author:

Dr. Biru Rajak

HoD and Assistant Professor, Department of Computer Science
Asansol Girls' College

Copyright 2026 by Dr. Biru Rajak

First Impression: February 2026

**Artificial Intelligence and Cloud Computing:
Foundations and Applications**

ISBN: 978-81-19477-97-5

Rs. 1000/- (\$80)

No part of the book may be printed, copied, stored, retrieved, duplicated and reproduced in any form without the written permission of the editor/publisher.

DISCLAIMER

Information contained in this book has been published by Nex Gen Publications and has been obtained by the Author from sources believed to be reliable and correct to the best of their knowledge. The authors are solely responsible for the contents of the articles compiled in this book. Responsibility of authenticity of the work or the concepts/views presented by the author through this book shall lie with the author and the publisher has no role or claim or any responsibility in this regard. Errors, if any, are purely unintentional and readers are requested to communicate such error to the author to avoid discrepancies in future.

Published by:
Nex Gen Publications

Preface

Artificial Intelligence (AI) and Cloud Computing have emerged as two of the most transformative forces shaping modern computing, industry, and society. Individually, each has redefined how data is processed, stored, and utilized; together, they form a powerful technological ecosystem that enables scalable intelligence, real-time analytics, and data-driven decision-making at unprecedented levels. This book, *Artificial Intelligence and Cloud Computing: Foundations and Applications*, is written to provide a structured, conceptually clear, and application-oriented understanding of this convergence.

The primary objective of this book is to bridge the gap between theoretical foundations and practical implementation. It introduces readers to the core principles of artificial intelligence—such as machine learning, neural networks, and intelligent systems—alongside the architectural models, service paradigms, and deployment strategies of cloud computing. Rather than treating these domains as isolated subjects, the book emphasizes their interdependence, demonstrating how cloud platforms serve as critical enablers for modern AI development, deployment, and scalability.

This text is intended for undergraduate and postgraduate students of computer science, information technology, data science, and related disciplines, as well as professionals seeking a structured entry into AI-enabled cloud systems. The content is presented in a progressive manner, beginning with fundamental concepts and gradually advancing toward real-world applications across sectors such as healthcare, finance, education, governance, and smart infrastructure.

Special attention has been given to clarity, conceptual rigor, and relevance. Technical discussions are supported by practical examples, architectural insights, and application scenarios to ensure that readers not only understand what these technologies are, but also how and why they are used. By the end of this book, readers will be equipped with a comprehensive understanding of AI and cloud computing, enabling them to critically engage with current technologies and adapt to future advancements.

Acknowledgement

The completion of the book Artificial Intelligence and Cloud Computing: Foundations and Applications has been possible through the intellectual support, guidance, and cooperation of several individuals and institutions who contributed directly or indirectly to its development.

First and foremost, I would like to acknowledge the scholars, researchers, and practitioners whose work in the fields of artificial intelligence, machine learning, data science, and cloud computing has laid the theoretical and practical foundation upon which this book is built. Their published research, frameworks, and real-world implementations have been indispensable in shaping the discussions and analyses presented in this work.

I extend my sincere gratitude to academic mentors and colleagues who provided critical feedback, constructive suggestions, and technical insights during the planning and writing stages. Their rigorous perspectives helped refine the conceptual clarity and ensured that the content maintains academic integrity while remaining relevant to contemporary technological developments.

I am also thankful to the students, professionals, and peers who engaged in discussions on emerging trends in AI-driven cloud systems. These interactions played a significant role in identifying practical challenges, application-oriented case scenarios, and interdisciplinary linkages addressed in this book.

Special appreciation is due to the publishers, editors, and reviewers whose meticulous efforts improved the structure, presentation, and overall quality of the manuscript. Their commitment to accuracy and consistency ensured that the final work meets scholarly and professional standards.

Finally, I acknowledge the support of my family and well-wishers, whose patience and encouragement provided the necessary environment to complete this work. While every effort has been made to ensure accuracy and relevance, any limitations or omissions remain solely the responsibility of the author.

It is hoped that this book will serve as a valuable resource for students, researchers, and professionals seeking to understand the foundational principles and applied dimensions of artificial intelligence and cloud computing.

Dr. Biru Rajak

Table of Contents

<i>Chapter 1:</i>	1 - 20
<i>Introduction to Artificial Intelligence and Cloud Computing</i>	
<i>Chapter 2:</i>	21 – 40
<i>Foundations of Artificial Intelligence</i>	
<i>Chapter 3:</i>	41 - 60
<i>Fundamentals of Cloud Computing</i>	
<i>Chapter 4:</i>	61 - 81
<i>AI Infrastructure and Cloud-Based AI Platforms</i>	
<i>Chapter 5:</i>	82 - 100
<i>Big Data, Analytics, and Intelligent Cloud Systems</i>	
<i>Chapter 6:</i>	101 - 119
<i>Applications of AI and Cloud Computing</i>	
<i>Chapter 7:</i>	120 - 143
<i>Security, Privacy, and Governance</i>	
<i>Chapter 8:</i>	144 - 166
<i>Emerging Trends and Future Directions</i>	

ABOUT THE AUTHOR :**Dr. Biru Rajak**

HoD and Assistant Professor, Department of Computer Science
Asansol Girls' College

Dr. Biru Rajak has completed his master's and Ph.D. in computer science and engineering from MNNIT Allahabad. He has four years of experience in the IT industry at world top class MNC and 8+ years of teaching experience in Govt College. Apart from this, he has more than six patents and twelve international publications in reputed journals. Dr. Biru Rajak presents a thorough exploration of the latest developments and breakthroughs in the field of computer science and innovation. With his extensive expertise and research contributions, Dr. Rajak delves into key topics ranging from foundational principles to cutting-edge advancements, providing readers with a comprehensive understanding of the discipline's evolution.

ABOUT THE BOOK :

Artificial Intelligence and Cloud Computing: Foundations and Applications explores the core principles and practical integration of artificial intelligence and cloud computing. The book covers key AI concepts such as machine learning, deep learning, and intelligent systems alongside cloud technologies including virtualization, distributed computing, and scalable service models (IaaS, PaaS, SaaS). It explains how cloud platforms enable large-scale AI deployment, data processing, and real-time applications. With practical examples and emerging trends like MLOps, IoT integration, and AI-driven automation, the book provides a clear understanding of how these technologies work together to drive digital transformation and innovation across industries.

