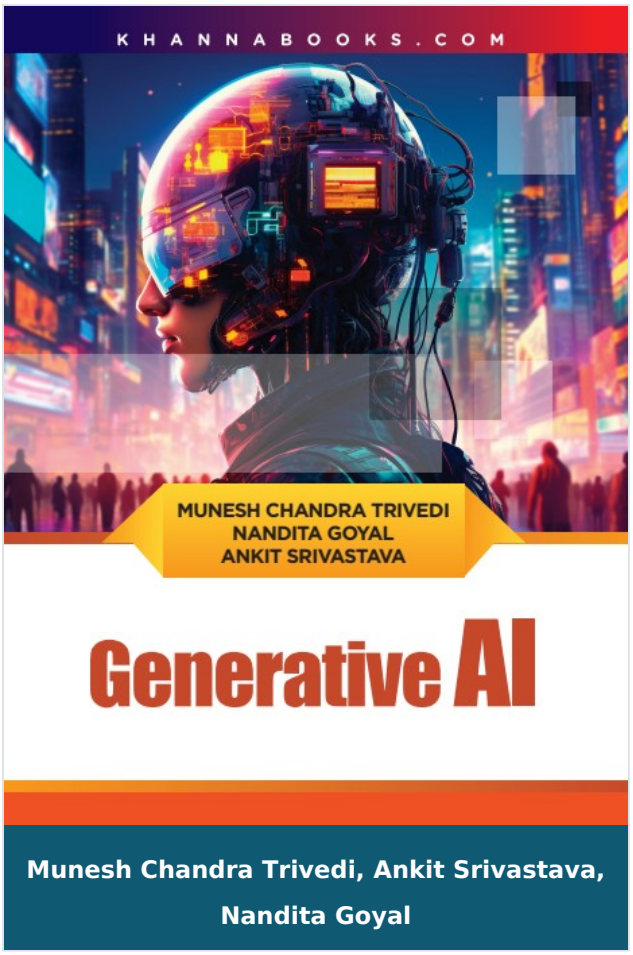

Generative AI

Author :	Munesh Chandra Trivedi, Ankit Srivastava, Nandita Goyal
ISBN 13 :	978-93-55386-39-7
ISBN 10 :	9355386397
E-ISBN 13 :	978-93-55386-39-7
Edition :	1
Pages :	312
Type of book :	Physical
Year :	2026
Language :	English
Publisher :	Khanna Publishing House
M.R.P :	Rs 448.00
Categories :	Computer Science Engineering, New Arrivals, Book Store
Condition Type :	New
Country Origin :	India

Product Description

Generative AI: foundations, models, and Applications are a comprehensive guide that explores one of the most transformative areas of artificial intelligence—machines that create. This book offers an in-depth, yet accessible journey through the theoretical principles, algorithmic frameworks, and practical implementations that underpin generative models. Designed for students, researchers, and industry professionals alike, it bridges the gap between foundational understanding and real-world application.

The book begins with a concise introduction to machine learning and deep learning, establishing the mathematical and conceptual foundation required to understand generative models. It the systematically introduces key architectures such as variation autoencoders (VAEs), Generative adversarial Networks (GANs), autoregressive models, diffusion models, and large-scale transformer-based systems such as GPT and DALL-E.

Special attention is given to transformer architectures and multimodal generative models, which are reshaping fields such natural language processing, computer vision, digital art, and scientific discovery. Practical code examples and implementation guidance are provided using popular frameworks, empowering readers to build and experiment with their own models.

This book also examines the broader impact of generative AI--- from ethical considerations and safety challenges to the societal implications of machine- generated content. It encourages critical thinking about issues like deep fakes, misinformation, algorithmic bias, and intellectual property in the age of AI-Generated media.

Whether you are a student preparing for a career in AI, a software developer exploring new tools, or a researcher seeking a deeper understanding of generative technologies, this book serves as both a foundational text and a forward-looking reference. It combines clarity, depth, and practical relevance to help you master the art and science of

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Generative AI.

SALIENT FEATURES OF THE BOOK

- The language is simple and easily understandable.
- Includes hands-on approach for learning the subject.
- Explores a wide spectrum of generative architectures including variational autoencoders (VAEs), Generative adversarial Networks (GANs), Transformer-based models (e.g., GPT), Diffusion models, and multimodal systems.
- Provides mathematical details without losing the reader in complexity.
- Includes exercises and examples.
- Includes in-depth discussions on cutting-edge advancements such as attention mechanisms, transformer architectures, large language models (LLMs), prompt engineering, and fine-tuning techniques.
- Prepares readers not just to use today’s tools, but to adapt to tomorrow’s innovations---offering insights into emerging trends such as foundation models, generative agents, and open-ended creativity in AI.
- An application-centric view is highlighted to provide an understanding of the practical uses of each class of techniques.
- Greater focus is placed on modern deep learning ideas such as attention mechanisms, transformers, and pre-trained language models.

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Mr. Ankit Srivastava is a dedicated academic and researcher with over six years of teaching experience in various engineering colleges and the National Institute of Electronics and Information Technology (NIT), Agartala, Tripura, India. His research primarily focuses on medical imaging and image processing, with an emphasis on leveraging artificial intelligence to contribute to technological advancements in healthcare. Mr. Srivastava has published six research papers in reputed SCI-E and Scopus-Indexed Journal, as well as in several national and international conferences. He also holds three national patents and is the author of a book titled “Introduction to AI and Machine Learning.” His academic journey reflects a strong commitment to innovation, Knowledge dissemination, and research excellence in the field of artificial intelligence and its application in medical science.

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Dr. Nandita Goyal has more than 17 years’ experience in Teaching and Research. Her areas of interest are Cloud Computing, Deep learning and Neural Networks. She has published many research papers in different reputed International Journals and

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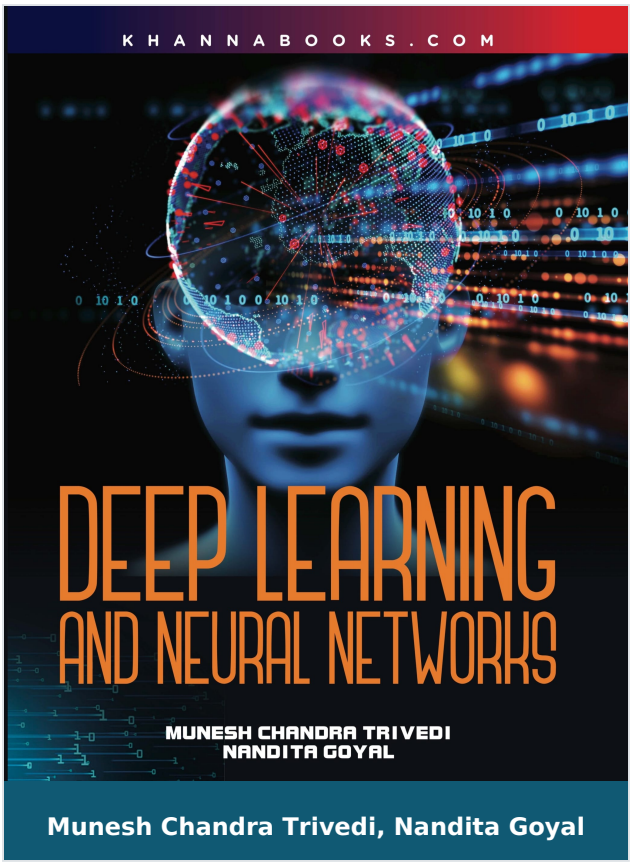

Deep Learning and Neural Networks

Author :	Munesh Chandra Trivedi, Nandita Goyal
ISBN 13 :	978-93-55383-98-3
ISBN 10 :	9355383983
E-ISBN 13 :	978-93-55383-98-3
Edition :	1
Pages :	172
Type of book :	Physical
Year :	2025
Language :	English
Publisher :	Khanna Publishing House
M.R.P :	Rs 298.00
Categories :	Emerging Technologies, Book Store
Condition Type :	New
Country Origin :	India

Product Description

The focus on the theory, algorithms, implementations and practical applications of deep learning and neural networks makes An Insight into Deep Learning and Neural Networks useful for students of Computer Science and mathematics. The book introduces neural networks starting with a quick tour of the very first ANN architectures, then covering topics such as training nets, recurrent neural networks, and reinforcement learning. Where possible, an application -centric view is highlighted to provide an understanding of the practical uses of each class of techniques.

Students of Computer Science and other related natural sciences will find it easy -to- read textbook, excellent for self -study, a high school level Knowledge of mathematics being the only pre-requisite to understand the material.

Salient Features of the Book:

1. The language is simple and easily understandable.
2. Includes hands-on approach for learning the subject.
3. Simple and intuitive discussions of neural networks and deep learning.
4. Provides mathematical details without losing the reader in complexity.
5. Include exercises and examples.
6. Discusses both traditional neural networks and recent deep learning models.
7. Covers both classical and modern models in deep learning.
8. An application-centric view is highlighted to provide an understanding of the practical uses of each class of techniques.
9. Greater focus is placed on modern deep learning ideas such as attention mechanisms, transformers, and pretrained language models.

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- Convolution Neural Network, Image Classification and CNN.
- RNN and LSTMs, Applications of RNNs in Real World.
- Creating and Deploying Networks using Tensor Flow and Keras.

Author

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Dr. Munesh Chandra Trivedi has more than 20 years of experience in the field of computer science & Engineering and has worked in Prestigious Institutions. He has more than 10 years' experience in various administrative responsibilities e.g., Dean (academics), Head of Department, TEQIP-111 Coordinator, PG coordinator, EDC cell Coordinator. Currently working Tripura, India, and Associate Professor and HoD (IT), Rajkiya Engineering College, Azamgarh, up (state Govt Institution of UP) with the additional responsibility of Dean Academics of the institute & Associate Dean UG Programs, Dr. APJ Abdul Kalam Technical University, Lucknow (State Technical University). He was also the Director (In-charge) at Rajkiya Engineering College, Azamgarh. He had successfully filed 81 patents (65 National and 16 International Patents (Germany, South Africa, and Australia)), out of which 40 patents were granted. He has published 12 textbooks and 168 research papers in different International Journals and proceedings of repute. He has also edited 38 books for springer Nature. He successfully supervised 14 PhD students and received numerous awards, including the Young scientist Visiting Fellowship, Albert Einstein Research scientist Award, Best senior Faculty Award, Outstanding Scientist, Dronacharya Award, Author of the Year, and vigyan Ratan award from different national, as well as international forums. He has organized more than 32

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international conferences technically sponsored by IEEE, ACM, AND Springer. Dr.

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