1. Record Nr. UNINA9910734836503321

Autore	Aggarwal Charu C.
Titolo	Neural Networks and Deep Learning : A Textbook / / by Charu C. Aggarwal
Pubbl/distr/stampa	Cham : , : Springer International Publishing : , : Imprint : Springer, , 2023
ISBN	3-031-29642-7
Edizione	[2nd ed. 2023.]
Descrizione fisica	1 online resource (xxiv, 529 pages) : illustrations
Disciplina	006.32
Soggetti	Machine learning Data mining Artificial intelligence Expert systems (Computer science) Natural language processing (Computer science) Machine Learning Data Mining and Knowledge Discovery Artificial Intelligence Knowledge Based Systems Natural Language Processing (NLP) Xarxes neuronals (Informàtica) Aprenentatge automàtic Llibres electrònics
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Nota di bibliografia	Includes bibliographical references and index.
Nota di contenuto	An Introduction to Neural Networks -- The Backpropagation Algorithm -- Machine Learning with Shallow Neural Networks -- Deep Learning: Principles and Training Algorithms -- Teaching a Deep Neural Network to Generalize -- Radial Basis Function Networks -- Restricted Boltzmann Machines -- Recurrent Neural Networks -- Convolutional Neural Networks -- Graph Neural Networks -- Deep Reinforcement Learning -- Advanced Topics in Deep Learning.
Sommario/riassunto	This book covers both classical and modern models in deep learning. The chapters of this book span three categories: 1. The basics of neural

networks: The backpropagation algorithm is discussed in Chapter 2. Many traditional machine learning models can be understood as special cases of neural networks. Chapter 3 explores the connections between traditional machine learning and neural networks. Support vector machines, linear/logistic regression, singular value decomposition, matrix factorization, and recommender systems are shown to be special cases of neural networks. 2. Fundamentals of neural networks: A detailed discussion of training and regularization is provided in Chapters 4 and 5. Chapters 6 and 7 present radial-basis function (RBF) networks and restricted Boltzmann machines. 3. Advanced topics in neural networks: Chapters 8, 9, and 10 discuss recurrent neural networks, convolutional neural networks, and graph neural networks. Several advanced topics like deep reinforcement learning, attention mechanisms, transformer networks, Kohonen self-organizing maps, and generative adversarial networks are introduced in Chapters 11 and 12. The book is written for graduate students, researchers, and practitioners. Where possible, an application-centric view is highlighted in order to provide an understanding of the practical uses of each class of techniques. The second edition is substantially reorganized and expanded with separate chapters on backpropagation and graph neural networks. Many chapters have been significantly revised over the first edition. Greater focus is placed on modern deep learning ideas such as attention mechanisms, transformers, and pre-trained language models.