
Deep belief nets are one of the most exciting recent developments in artificial intelligence. The structure of these elegant models is much closer to that of human brains than traditional neural networks; they have a 'thought process' that is capable of learning abstract concepts built from simpler primitives. A typical deep belief net can learn to recognize complex patterns by optimizing millions of parameters, yet this model can still be resistant to overfitting. This book presents the essential building blocks of a common and powerful form of deep belief net: the autoencoder. You'll take this topic beyond current usage by extending it to convolutional autoencoders which focus on the creation of complex-domain predictors that are suitable for input to a complex-domain autoencoder. Finally, you'll learn an algorithm for unsupervised learning in the form of the competitive hierarchal clustering algorithm.


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Deep Belief Nets in C++ and Cuda C: Volume 3 - Timothy Masters - 2015-06-24

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Deep learning is providing exciting solutions for medical image analysis problems and is seen as a key method for future applications. This book gives a clear overview of the principles and methods of deep learning, and deep learning concepts, showing how the algorithms that integrate deep learning as a core component have been applied to medical image detection, segmentation and registration, and computer-aided analysis, using a wide variety of application areas. Deep learning is providing exciting solutions for medical image analysis problems and is seen as a key method for future applications. This book gives a clear overview of the principles and methods of deep learning, and deep learning concepts, showing how the algorithms that integrate deep learning as a core component have been applied to medical image detection, segmentation and registration, and computer-aided analysis, using a wide variety of application areas. Development of deep learning algorithms for medical image analysis is a great learning resource for academic and industry researchers in medical image analysis, and for graduate students taking courses on machine learning and deep learning for computer vision and medical image computing and analysis. Covers common research problems in medical image analysis and their challenges Describes deep learning methods and the theo retic background for medical image analysis Teaches how algorithms are applied to a broad range of application areas, including X-ray, mammogram, chest, microcopy, and pathology. Includes a Forward written by Nicholas Ayache

Deep Learning for Medical Image Analysis - S. Kevin Zhao - 2017-03-18

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The five volume set LNCS 7663, LNCS 7664, LNCS 7665, LNCS 7666 and LNCS 7667 constitutes the proceedings of the 19th International Conference on Neural Information Processing, ICONIP 2012, held in Doha, Qatar, in November 2012. The 423 regular session papers were carefully reviewed and selected from a total of 2128 submissions, reflecting the broad participation and international attraction of the conference. The 7 volumes represent 5 topical sections containing papers on theoretical analysis, neural modeling, algorithms, applications, as well as simulations and synthesis.

Sensor Signal and Information Processing II - Wai Lok Woo - 2020-12-29

In the current age of information explosion, sensor technologies and software are now tightly integrated with our everyday lives. Many sensor processing algorithms have been integrated into smartphones and tablets to provide us with useful applications in our daily life. Deep artificial neural networks such as convolutional neural networks provide powerful new approaches for analysis and processing of sensor signals and images. The handbook introduces the latest advances in deep learning in the realm of sensor signals and information processing. It is useful for researchers, engineers, industries, and professionals interested in deep learning techniques.

Deep Learning: A Professional Resource - Ian Goodfellow - 2016-11-10

An introduction to a broad range of topics in deep learning, covering mathematical and conceptual background, deep learning techniques used in industry, and research perspectives from the fields of vision, speech, language, natural language, and generative models. The text draws on the author's experience in the field, including first-hand experience with notable successes and failures. It is written for practitioners in industry and researchers in academia, and serves as a comprehensive reference source that trends in data analytics and potential technologies that will facilitate insight in various domains of science, industry, business, and consumer products.

Deep Learning - Ian Goodfellow - 2016-11-10

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Advances in Deep Learning and Neural Networks - Editors - 2018-11-18

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Neuromorphic engineering has just reached its 25th year as a discipline. In the first two decades neuromorphic engineers focused on building models of sensors, such as silicon cochleas and retinas, and building blocks such as silicon neurons and synapses. Those designs have honed our skills in implementing sensors and neural networks in VLSI using analog and mixed mode circuits. Over the last decade the address event representation has been used to interface devices and computers from different designers and even different groups. This facility has been essential for our ability to combine sensors, neural networks, and actuators into neuromorphic computing systems. This book (Deep Learning and Parallel Computing Environment for Bioengineering Systems, 2021) integrates the core ideas of deep learning and its applications in bio-engineering application domains, to be accessible to all scholars and academicians. The book also provides a detailed overview of the state-of-the-art research achievements and the latest practical and application-oriented approaches applied to parallel computing environment in bioengineering systems provides concepts and technologies that are successfully used in the implementation of today’s intelligent data-centric critical systems and multimedia Cloud Big data.

Deep Learning and Parallel Computing Environment for Bioengineering Systems - Arun Kumar Sanjapah - 2020-07-26

Deep learning includes a subset of machine learning for processing the unsupervised data with artificial neural network functions. The major advantage of deep learning is to process big data analytics for better analysis and self-adaptive algorithms to handle more data. When applied to deep learning, engineers can handle a variety of problems related to image analysis, voice analysis, and machine learning. Deep learning is part of state-of-the-art systems in various disciplines, particularly computer vision, automatic speech recognition (ASR) and human action recognition. Deep learning is part of the latest tactics on how to build and apply customized deep learning models for various applications. It also explores the latest concepts, algorithms, and techniques of deep learning and data mining and analysis. Highlighting a range of topics such as deep learning applications and intelligent decision making in engineering, it also presents new methods including machine learning and compressive sampling, which help to improve safety, reliability, and performance. Conditioning Monitoring with Vibration Signals: Compressive Sampling and Learning Algorithms for Rotating Machines is an excellent book for research students, postgraduate professionals, academicians and postgraduate students seeking current research on the implementation of automation and deep learning in various engineering disciplines.

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Deep Learning and Parallel Computing Environment for Bioengineering Systems delivers a significant forum for the technical advancement of deep learning in parallel computing environment across bio-engineering diversified domains and its applications. Pursuing an interdisciplinary approach, it focuses on methods used to identify and acquire valid, potentially useful knowledge sources. Managing the gathered knowledge and applying it to multiple domains including health care, social networks, autonomous systems, and cyber-physical systems. Deep learning is part of state-of-the-art systems in various disciplines, particularly computer vision, automatic speech recognition (ASR) and human action recognition. It also presents new methods including machine learning and compressive sampling, which help to improve safety, reliability, and performance. Conditioning Monitoring with Vibration Signals: Compressive Sampling and Learning Algorithms for Rotating Machines is an excellent book for research students, postgraduate professionals, academicians and postgraduate students seeking current research on the implementation of automation and deep learning in various engineering disciplines.

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objective of moving ML closer to one of its original goals, i.e. artificial intelligence. Deep learning was developed as an ML approach to deal with complex input-output mappings. While traditional methods successfully solve problems where final value is a simple function of input data, deep learning techniques are able to capture complex and non-linear relationships between input and output values. These models are able to perform tasks such as image recognition, speech recognition, natural language processing, and even games like Go and chess.

Deep Learning in Natural Language Processing - Li Deng - 2015-05-23

Recent advances in computational learning theory, sparse coding, deep learning, big data and cloud computing. In particular, the striking success of deep learning in a wide variety of natural language processing (NLP) applications has served as a benchmark for the advances in the most important tasks in artificial intelligence. This book reviews the state of the art of deep learning research and its successful applications to major NLP tasks, including speech recognition and understanding, dialogue systems, lexical analysis, parsing, knowledge graphs, machine translation, question answering, sentiment analysis, social computing, and natural language generation from images. Outlining and analyzing various research frontiers of NLP in the deep learning era, it features self-contained, comprehensive chapters written by leading researchers in the field. A glossy of technical terms and commonly used acronyms in the intersection of deep learning and NLP is also provided. The book appeals to advanced undergraduate and graduate students, post-doctoral researchers, lecturers and industrial researchers, as well as anyone interested in deep learning and natural language processing.

Signal and Information Processing, Networking and Computers - Shojiro Sino - 2017-12-12

This proceedings book presents the latest research in the fields of information theory, communication system, computer science and signal processing, as well as other related techniques. It is targeted to researchers from the fields of Signal and Information Processing, Networking and Computers (CSCiD), held in Chongqing, China on September 13-15, 2017, it is of interest to professionals from academia and industry alike.

Neural Networks and Statistical Learning - Le-Quan Xu - 2015-06-09

This book provides a broad yet detailed introduction to neural networks and machine learning in a statistical framework. A single, comprehensive resource for study and further research, it explores the major popular neural network models and statistical learning approaches with samples and exercises and allows readers to gain a practical working understanding of the content. The updated new edition presents recently published results and includes six new chapters that correspond to the most advanced research. Each chapter features state-of-the-art descriptions and significant research findings. The topics covered include: • multilayer perceptron; • the Hopfield network; • associative memory models; • clustering models and algorithms; • the radial basis function network; • recurrent neural networks; • memristive circuit matrix; • complex independent component analysis; • principal component analysis; • Bayes networks; and • fuzzy sets and logic. Focusing on the prominent accomplishments and their practical aspects, this book provides academic and technical staff, as well as graduate students and researchers with a solid foundation and comprehensive reference on the fields of neural networks, pattern recognition, signal processing, and machine learning.

Deep Learning and Missing Data in Engineering Systems - Collins Achebue Leh - 2018-12-13

This book constitutes the refereed proceedings of the 15th International Symposium on Neural Networks, ISNN 2018, held in Minsk, Belarus in June 2018. The 98 revised regular papers presented in this volume were carefully reviewed and selected from 214 submissions. The papers cover many topics of neural network-related research including intelligent control, neurodynamic analysis, bio-signals, bioinformatics and biomedical engineering, clustering, classification, forecasting, models, algorithms, cognitive computation, machine learning, and optimization.

Advances in Neural Networks - ISSN 2018 - Linping Huang - 2018-05-25

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Computer Vision - ECCV 2018 - Vittozzo Ferretti - 2018-10-05

The ten-volume set comprising the LNCs volumes 11205-11220 constitutes the refereed proceedings of the 15th European Conference on Computer Vision, ECCV 2018, held in Munich, Germany, in September 2018. The book presents results of peer reviewed papers presented at the conference. The publications are organized in topical sections on learning for vision, computational photography; human analysis; human sensing; stereo and reconstruction; optimization; matching and recognition; video attention; and poster sessions.

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