Deep Convolutional Neural Network Based Approach For

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Machine Learning and Deep Learning in Real-Time Applications Morgan Kaufmann
This book constitutes the proceedings of the 4th International Conference on Computational Intelligence, Cyber Security, and Computational Models, ICC3 2019, which was held in Coimbatore, India, in December 2019. The 9 papers presented in this volume were carefully reviewed and selected from 38 submissions. They were organized in topical sections named: computational intelligence; cyber security; and computational models.

Effect of Enhancement on Convolutional Neural Network Based Multi-view Object Classification Academic Press
Fourth International Conference on Information and Communication Technology for Competitive Strategies targets state-of-the-art as well as emerging topics pertaining to information and communication technologies (ICTs) and effective strategies for its implementation for engineering and intelligent applications.

Data Mining Engineering Science Reference
Biopotential signals are often used by physicians to measure the activities of organs and tissues in the human body. This book describes the sources and characteristics of different biopotential signals and provides an understanding of how a range of signals can be modelled and analysed. The resulting information can be used to assist in the identification of disorders such as epilepsy, schizophrenia, PTSD and heart disease, among others. An emphasis is placed on the real challenges in biopotential signal processing due to the complex and non-stationary nature of signals. Following on from volume one, this book starts with a collection of chapters covering some of the latest developments in electroencephalography (EEG) signal analysis, then moves on to applications of electrocardiography (ECG) and otoscope signals. The volume concludes with a discussion of other monitoring techniques. The chapters include biomedical examples and discussions of how each method can be used to study human organs. It is a valuable guide for all researchers and practitioners who are engaged in studies and research in the area of biomedical signals and their applications. Key Features Modelling and acquisition of biomedical signals for different disorders Implementation of methodologies and their impact on different cases Case studies and research directions Design and simulation examples

Second International Workshop, TIA 2020, Held in Conjunction with MICCAI 2020, Lima, Peru, October 8, 2020, Proceedings Springer Nature
This must-read text/reference introduces the fundamental concepts of convolutional neural networks (ConvNets), offering practical guidance on using libraries to implement ConvNets in applications of traffic sign detection and classification. The work presents techniques for optimizing the computational efficiency of ConvNets, as well as visualization techniques to better understand the underlying processes. The proposed models are also thoroughly evaluated from different perspectives, using exploratory and quantitative analysis. Topics and features: explains the fundamental concepts behind training linear classifiers and feature learning; discusses the wide range of loss functions for training binary and multi-class classifiers; illustrates how to derive ConvNets from fully connected neural networks, and reviews different techniques for evaluating neural networks; presents a practical library for implementing ConvNets, explaining how to use a Python interface for the library to create and assess neural networks; describes two real-world examples of the detection and classification of traffic signs using deep learning methods; examines a range of varied techniques for visualizing neural networks, using a Python interface; provides self-study exercises at the end of each chapter, in addition to a helpful glossary, with relevant Python scripts supplied at an associated website. This self-contained guide will benefit those who seek to both understand the theory behind deep learning, and to gain hands-on experience in implementing ConvNets in practice. As no prior background knowledge in the field is required to follow the material, the book is ideal for all students of computer vision and machine learning, and will also be of great interest to practitioners working on autonomous cars and advanced driver assistance systems.

Interpretable Machine Learning Apress
Action Recognition Classification and Clustering Cognitive and Biologically Inspired Analysis Data Mining for Machine Vision, Image Analysis and Pattern Recognition Dimensionality Reduction in MVIP Document Analysis Event Recognition Feature Extraction Graphical Models for MVIP Industrial, Medical, Social, and Military Applications of MVIP Machine Learning (including Deep Learning) for MVIP Pattern Recognition for Big Data Pattern Recognition in Bioinformatics and Biological Computations Scene Analysis and Understanding Self Driving Cars 2D 3D Object Detection, Recognition, Segmentation, and Retrieval 3D Analysis from Multi view and Single view Applications of machine vision for control and monitoring of transportation in ports

Deep Learning in Computer Vision Springer
Step-by-step tutorials on deep learning neural networks for computer vision in python with Keras.

Principles and Applications Packt Publishing
The main goal of this thesis is classification of multi-view objects by using convolutional neural networks (CNN), and evaluation of the recognition performance on images preprocessed by enhancement technologies such as multilevel windowed inverse sigmoid (MWIS) function and locally tuned sine nonlinearity (LTSN) technique. Humans can easily recognize objects in different observational directions, but machines cannot achieve this easily. The convolutional neural network (CNN), which has successfully been used to do visual imagery analysis, is a deep learning, feed-forward neural network that collects features of an image and classify them accordingly. A multi-layer CNN architecture is designed for multi-view object classification by appropriately choosing the number of layers, the sequence of layers cascading, and size of the filters. It is expected that the enhanced images exhibit stronger features. Therefore, we apply image enhancement techniques before the convolutional neural network to observe the recognition performance. The datasets used for performance evaluation in this work are from the Columbia Object Image Library (COIL-100) and Multi-view Car dataset. It is observed that the preprocessing by image enhancement can provide improved performance in some cases of the smaller training set. Research work is in progress to modify the CNN architecture to see the impact of recognition performance for multi-view object classification. Advanced non-linear enhancement technologies might also be investigated to see the effectiveness in classification.

Principles and Applications CRC Press
The purpose of this activity is to provide a forum for researchers, developers and practitioners from both academia and industry to meet and share cutting edge advancements in the field of Digital Futures and Transformative Technologies

Precision Medicine, High Performance and Large-Scale Datasets Springer Nature
Fundamentals of Brain Network Analysis is a comprehensive and accessible introduction to methods for unraveling the extraordinary complexity of neuronal connectivity. From the perspective of graph theory and network science, this book introduces, motivates and explains techniques for modeling brain networks as graphs of nodes connected by edges, and covers a diverse array of measures for quantifying their topological and spatial organization. It builds intuition for key concepts and methods by illustrating how they can be practically applied in diverse areas of neuroscience, ranging from the analysis of synaptic networks in the nematode worm to the characterization of large-scale human brain networks constructed with magnetic resonance imaging. This text is ideally suited to neuroscientists wanting to develop expertise in the rapidly developing field of neural connectomics, and to physical and computational scientists wanting to understand how these quantitative methods can be used to understand brain organization. Extensively illustrated throughout by graphical

representations of key mathematical concepts and their practical applications to analyses of nervous systems Comprehensively covers graph theoretical analyses of structural and functional brain networks, from microscopic to macroscopic scales, using examples based on a wide variety of experimental methods in neuroscience Designed to inform and empower scientists at all levels of experience, and from any specialist background, wanting to use modern methods of network science to understand the organization of the brain

Proceedings of 4th International Conference on Information and Communication Technology for Competitive Strategies (ICTCS 2019), December 13th-14th, 2019, Udaipur, India Springer

This book collects 14 articles from the Special Issue entitled “Deep Learning Applications with Practical Measured Results in Electronics Industries” of Electronics. Topics covered in this Issue include four main parts: (1) environmental information analyses and predictions, (2) unmanned aerial vehicle (UAV) and object tracking applications, (3) measurement and denoising techniques, and (4) recommendation systems and education systems. These authors used and improved deep learning techniques (e.g., ResNet (deep residual network), Faster-RCNN (faster regions with convolutional neural network), LSTM (long short term memory), ConvLSTM (convolutional LSTM), GAN (generative adversarial network), etc.) to analyze and denoise measured data in a variety of applications and services (e.g., wind speed prediction, air quality prediction, underground mine applications, neural audio caption, etc.). Several practical experiments were conducted, and the results indicate that the performance of the presented deep learning methods is improved compared with the performance of conventional machine learning methods.

IGI Global

Deep learning algorithms have brought a revolution to the computer vision community by introducing non-traditional and efficient solutions to several image-related problems that had long remained unsolved or partially addressed. This book presents a collection of eleven chapters where each individual chapter explains the deep learning principles of a specific topic, introduces reviews of up-to-date techniques, and presents research findings to the computer vision community. The book covers a broad scope of topics in deep learning concepts and applications such as accelerating the convolutional neural network inference on field-programmable gate arrays, fire detection in surveillance applications, face recognition, action and activity recognition, semantic segmentation for autonomous driving, aerial imagery registration, robot vision, tumor detection, and skin lesion segmentation as well as skin melanoma classification. The content of this book has been organized such that each chapter can be read independently from the others. The book is a valuable companion for researchers, for postgraduate and possibly senior undergraduate students who are taking an advanced course in related topics, and for those who are interested in deep learning with applications in computer vision, image processing, and pattern recognition.

14th European Conference, Amsterdam, The Netherlands, October 11–14, 2016, Proceedings, Part IV Academic Press

In this thesis, we introduce an integrated method to build personalized full body 3D models of people given frontal and profile silhouette images. Several deep convolutional neural network (CNN) architectures have been designed and trained to accurately estimate the positions of a set of anthropometric set of ordered control points on the frontal and profile silhouette images. For the prediction of key points on the frontal silhouette image, the output from four different convolutional neural networks have been fused together to generate the final coordinates. A global CNN is first designed to predict those control points on all parts of the body. This has been reinforced with local deep CNN architectures focused on the prediction of control points on localized areas of the body to improve on the accuracy of predictions. Fusing the global and local predictions yielded an estimate of the coordinates of 56 control points on the frontal image and 26 control points on the side view image of a person. The controlled points are then regularized to reside on the silhouette of the frontal and profile images using a combination of Canny edge detector and shortest distance mapping. The set of regularized control points are then fed into a model-based 3D reconstruction algorithm [1] to yield the corresponding high-resolution 3D model of the person. A database of 800 models from the Caesar dataset were studied, of which 100 were used to train and the other 700 were used for testing and classification of 3D models. Our method achieves an accuracy of 99.7 % in prediction of control points and 3D reconstruction using those points. We also present a classification scheme to allocate a test surface to one of competing base surfaces. The classification is based on computing the error between salient points with identical anthropometric meaning that reside on a nested set of boundaries in the frontal and profile projection image spaces. The method can have a variety of applications ranging from medical imaging, to 3D modeling for recognition, virtual reality, generation of video games, 3D animation, etc.

Data Science for COVID-19 Volume 1 Springer Nature

This book helps you master CNN, from the basics to the most advanced concepts in CNN such as GANs, instance classification and attention mechanism for vision models and more. You will implement advanced CNN models using complex image and video datasets. By the end of the book you will learn CNN’s best practices to implement smart ConvNet ...

A Practical Application to Traffic-Sign Detection and Classification Academic Press

Artificial Intelligence for Future Generation Robotics offers a vision for potential future robotics applications for AI technologies. Each chapter includes theory and mathematics to stimulate novel research directions based on the state-of-the-art in AI and smart robotics. Organized by application into ten chapters, this book offers a practical tool for researchers and engineers looking for new avenues and use-cases that combine AI with smart robotics. As we witness exponential growth in automation and the rapid advancement of underpinning technologies, such as ubiquitous computing, sensing, intelligent data processing, mobile computing and context aware applications, this book is an ideal resource for future innovation. Brings AI and smart robotics into imaginative, technically-informed dialogue Integrates fundamentals with real-world applications Presents potential applications for AI in smart robotics by use-case Gives detailed theory and mathematical calculations for each application Stimulates new thinking and research in applying AI to robotics

Trends in Deep Learning Methodologies Myprint

The eight-volume set comprising LNCS volumes 9905-9912 constitutes the refereed proceedings of the 14th European Conference on Computer Vision, ECCV 2016, held in Amsterdam, The Netherlands, in October 2016. The 415 revised papers presented were carefully reviewed and selected from 1480 submissions. The papers cover all aspects of computer vision and pattern recognition such as 3D computer vision; computational photography, sensing and display; face and gesture; low-level vision and image processing; motion and tracking; optimization methods; physicsbased vision, photometry and shape-from-X; recognition: detection, categorization, indexing, matching; segmentation, grouping and shape representation; statistical methods and learning; video: events, activities and surveillance; applications. They are organized in topical sections on detection, recognition and retrieval; scene understanding; optimization; image and video processing; learning; action activity and tracking; 3D; and 9 poster sessions.

Advancing Cardiovascular MRI Acquisition Through Deep Convolutional Neural Network-Based Localization Academic Press

Develop and optimize deep learning models with advanced architectures. This book teaches you the intricate details and subtleties of the algorithms that are at the core of convolutional neural networks. In Advanced Applied Deep Learning, you will study advanced topics on CNN and object detection using Keras and TensorFlow. Along the way, you will look at the fundamental operations in CNN, such as convolution and pooling, and then look at more advanced architectures such as inception networks, resnets, and many more. While the book discusses theoretical topics, you will discover how to work efficiently with Keras with many tricks and tips, including how to customize logging in Keras with custom callback classes, what is eager execution, and how to use it in your models. Finally, you will study how object detection works, and build a complete implementation of the YOLO (you only look once) algorithm in Keras and TensorFlow. By the end of the book you will have implemented various models in Keras and learned many advanced tricks that will bring your skills to the next level. What You Will Learn See how convolutional neural networks and object detection work Save weights and models on disk Pause training and restart it at a later stage Use hardware acceleration (GPUs) in your code Work with the Dataset TensorFlow abstraction and use pre-trained models and transfer learning Remove and add layers to pre-trained networks to adapt them to your specific project Apply pre-trained models such as Alexnet and VGG16 to new datasets Who This Book Is For Scientists and researchers with intermediate-to-advanced Python and machine learning know-how. Additionally, intermediate knowledge of Keras and TensorFlow is expected.

Fundamentals of Brain Network Analysis Springer

Trends in Deep Learning Methodologies: Algorithms, Applications, and Systems covers deep learning approaches such as neural networks, deep belief networks, recurrent neural networks, convolutional neural networks, deep auto-encoder, and deep generative networks, which have emerged as powerful computational models. Chapters elaborate on these models which have shown significant success in dealing with massive data for a large number of applications, given their capacity to extract complex hidden features and learn efficient representation in unsupervised settings. Chapters investigate deep learning-based algorithms in a variety of application, including biomedical and health informatics, computer vision, image processing, and more. In recent years, many powerful algorithms have been developed for matching patterns in data and making predictions about future events. The major advantage of deep learning is to process big data analytics for better analysis and self-adaptive algorithms to handle more data. Deep learning methods can deal with multiple levels of representation in which the system learns to abstract higher level representations of raw data. Earlier, it was a common requirement to have a domain expert to develop a specific model for each specific application, however, recent advancements in representation learning algorithms allow researchers across various subject domains to automatically learn the patterns and representation of the given data for the development of specific models. Provides insights into the theory, algorithms, implementation and the application of deep learning techniques Covers a wide range of applications of deep learning across smart healthcare and smart engineering Investigates the development of new models and how they can be exploited to find appropriate solutions

A Convolutional Neural Network-based Approach to Personalized 3D Modeling of the Human Body and Its Classification Lulu.com

2021 International Conference on Digital Futures and Transformative Technologies (ICoDT2)

2019 IEEE National Aerospace and Electronics Conference (NAECON) 2021 International Conference on Digital Futures and Transformative Technologies (ICoDT2)The purpose of this activity is to provide a forum for researchers, developers and practitioners from both academia and industry to meet and share cutting edge advancements in the field of Digital Futures and Transformative TechnologiesDatabase Systems for Advanced Applications21st International Conference, DASFAA 2016, Dallas, TX, USA, April 16-19, 2016, Proceedings, Part I

Learn how to apply TensorFlow to a wide range of deep learning and Machine Learning problems with this practical guide on training CNNs for image classification, image recognition, object detection and many computer vision challenges. Key Features Learn the fundamentals of Convolutional Neural Networks Harness Python and Tensorflow to train CNNs Build scalable deep learning models that can process millions of items Book Description Convolutional Neural Networks (CNN) are one of the most popular architectures used in computer vision apps. This book is an introduction to CNNs through solving real-world problems in deep learning while teaching you their implementation in popular Python library - TensorFlow. By the end of the book, you will be training CNNs in no time! We start with an overview of popular machine learning and deep learning models, and then get you set up with a TensorFlow development environment. This environment is the basis for implementing and training deep learning models in later chapters. Then, you will use Convolutional Neural Networks to work on problems such as image classification, object detection, and semantic segmentation. After that, you will use transfer learning to see how these models can solve other deep learning problems. You will also get a taste of implementing generative models such as autoencoders and generative adversarial networks. Later on, you will see useful tips on machine learning best practices and troubleshooting. Finally, you will learn how to apply your models on large datasets of millions of images. What you will learn Train machine learning models with TensorFlow Create systems that can evolve and scale during their life cycle Use CNNs in image recognition and classification Use TensorFlow for building deep learning models Train popular deep learning models Fine-tune a neural network to improve the quality of results with transfer learning Build TensorFlow models that can scale to large datasets and systems Who this book is for This book is for Software Engineers, Data Scientists, or Machine Learning practitioners who want to use CNNs for solving real-world problems. Knowledge of basic machine learning concepts, linear algebra and Python will help.

Brain Tumor MRI Image Segmentation Using Deep Learning Techniques Springer

This master thesis presents the process of designing and implementing a CNN-based architecture for image recognition included in a larger project in the field of fashion recommendation with deep learning. Concretely, the presented network aims to perform localization and segmentation tasks. Therefore, an accurate analysis of the most well-known localization and segmentation networks in the state of the art has been performed. Afterwards, a multi-task network performing RoI pixel-wise segmentation has been created. This proposal solves the detected weaknesses of the pre-existing networks in the field of application, i.e. fashion recommendation. These weaknesses are basically related with the lack of a fine-grained quality of the segmentation and problems with computational efficiency. When it comes to improve the details of the segmentation, this network proposes to work pixel-wise, i.e. performing a classification task for each of the pixels of the image. Thus, the network is more suitable to detect all the details presented in the analysed images. However, a pixel-wise task requires working in pixel resolution, which implies that the number of operations to perform is usually large. To reduce the total number of operations to perform in the network and increase the computational efficiency, this pixel-wise segmentation is only done in the meaningful regions of the image (Regions of Interest), which are also computed in the network (RoI masks). Then, after a study of the more recent deep learning libraries, the network has been successfully implemented. Finally, to prove the correct operation of the design, a set of experiments have been satisfactorily conducted. In this sense, it must be noted that the evaluation of the results obtained during testing phase with respect to the most well-known architectures is out of the scope of this thesis as the experimental conditions, especially in terms of dataset, have not been suitable for doing so. Nevertheless, the proposed network is totally prepared to perform this evaluation in the future, when the required experimental conditions are available.

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