

Sparse Representation Modeling And Learning In Visual Recognition Theory Algorithms And Applications Advances In Computer Vision And Pattern Recognition

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Advances in Visual Computing - George Bebis
2011-09-13

The two volume set LNCS 6938 and LNCS 6939 constitutes the refereed proceedings of the 7th International Symposium on Visual Computing, ISVC 2011, held in Las Vegas, NV, USA, in September 2011. The 68 revised full papers and 46 poster papers presented together with 30 papers in the special tracks were carefully reviewed and selected from more than 240 submissions. The papers of part I (LNCS 6938) are organized in computational bioimaging, computer graphics, motion and tracking, segmentation, visualization; mapping modeling and surface reconstruction, biomedical imaging, computer graphics, interactive visualization in novel and heterogeneous display environments, object detection and recognition. Part II (LNCS 6939) comprises topics such as immersive visualization, applications, object detection and recognition, virtual reality, and best practices in teaching visual computing.

Sparse Modeling for Image and Vision Processing - Julien Mairal 2014-12-19

Sparse Modeling for Image and Vision Processing offers a self-contained view of sparse modeling for visual recognition and image processing. More specifically, it focuses on applications where the dictionary is learned and adapted to data, yielding a compact

representation that has been successful in various contexts.

The New Visual Neurosciences - John S. Werner 2013-10-25

A comprehensive review of contemporary research in the vision sciences, reflecting the rapid advances of recent years. Visual science is the model system for neuroscience, its findings relevant to all other areas. This essential reference to contemporary visual neuroscience covers the extraordinary range of the field today, from molecules and cell assemblies to systems and therapies. It provides a state-of-the-art companion to the earlier book *The Visual Neurosciences* (MIT Press, 2003). This volume covers the dramatic advances made in the last decade, offering new topics, new authors, and new chapters. *The New Visual Neurosciences* assembles groundbreaking research, written by international authorities. Many of the 112 chapters treat seminal topics not included in the earlier book. These new topics include retinal feature detection; cortical connectomics; new approaches to mid-level vision and spatiotemporal perception; the latest understanding of how multimodal integration contributes to visual perception; new theoretical work on the role of neural oscillations in information processing; and new molecular and genetic techniques for understanding visual

system development. An entirely new section covers invertebrate vision, reflecting the importance of this research in understanding fundamental principles of visual processing. Another new section treats translational visual neuroscience, covering recent progress in novel treatment modalities for optic nerve disorders, macular degeneration, and retinal cell replacement. The *New Visual Neurosciences* is an indispensable reference for students, teachers, researchers, clinicians, and anyone interested in contemporary neuroscience. Associate Editors Marie Burns, Joy Geng, Mark Goldman, James Handa, Andrew Ishida, George R. Mangun, Kimberley McAllister, Bruno Olshausen, Gregg Recanzone, Mandyam Srinivasan, W. Martin Usrey, Michael Webster, David Whitney Sections Retinal Mechanisms and Processes Organization of Visual Pathways Subcortical Processing Processing in Primary Visual Cortex Brightness and Color Pattern, Surface, and Shape Objects and Scenes Time, Motion, and Depth Eye Movements Cortical Mechanisms of Attention, Cognition, and Multimodal Integration Invertebrate Vision Theoretical Perspectives Molecular and Developmental Processes Translational Visual Neuroscience

Low-Rank and Sparse Modeling for Visual Analysis - Yun Fu 2016-10-01

This book provides a view of low-rank and sparse computing, especially approximation, recovery, representation, scaling, coding, embedding and learning among unconstrained visual data. The book includes chapters covering multiple emerging topics in this new field. It links multiple popular research fields in Human-Centered Computing, Social Media, Image Classification, Pattern Recognition, Computer Vision, Big Data, and Human-Computer Interaction. Contains an overview of the low-rank and sparse modeling techniques for visual analysis by examining both theoretical analysis and real-world applications.

Pattern Recognition - Tieniu Tan 2016-10-21

The two-volume set CCIS 662 and CCIS 663 constitutes the refereed proceedings of the 7th Chinese Conference on Pattern Recognition, CCPR 2016, held in Chengdu, China, in November 2016. The 121 revised papers presented in two volumes were carefully

reviewed and selected from 199 submissions. The papers are organized in topical sections on robotics; computer vision; basic theory of pattern recognition; image and video processing; speech and language; emotion recognition. Intelligence Science and Big Data Engineering - Changyin Sun 2013-11-18

This book constitutes the thoroughly refereed post-conference proceedings of the 4th International Conference on Intelligence Science and Big Data Engineering, IScIDE 2013, held in Beijing, China, in July/August 2013. The 111 papers presented were carefully peer-reviewed and selected from 390 submissions. Topics covered include information theoretic and Bayesian approaches; probabilistic graphical models; pattern recognition and computer vision; signal processing and image processing; machine learning and computational intelligence; neural networks and neuro-informatics; statistical inference and uncertainty reasoning; bioinformatics and computational biology and speech recognition and natural language processing.

Hierarchical Object Representations in the Visual Cortex and Computer Vision - Antonio Rodríguez-Sánchez 2016-06-08

Over the past 40 years, neurobiology and computational neuroscience has proved that deeper understanding of visual processes in humans and non-human primates can lead to important advancements in computational perception theories and systems. One of the main difficulties that arises when designing automatic vision systems is developing a mechanism that can recognize - or simply find - an object when faced with all the possible variations that may occur in a natural scene, with the ease of the primate visual system. The area of the brain in primates that is dedicated at analyzing visual information is the visual cortex. The visual cortex performs a wide variety of complex tasks by means of simple operations. These seemingly simple operations are applied to several layers of neurons organized into a hierarchy, the layers representing increasingly complex, abstract intermediate processing stages. In this Research Topic we propose to bring together current efforts in neurophysiology and computer vision in order 1) To understand how the visual cortex encodes an

object from a starting point where neurons respond to lines, bars or edges to the representation of an object at the top of the hierarchy that is invariant to illumination, size, location, viewpoint, rotation and robust to occlusions and clutter; and 2) How the design of automatic vision systems benefit from that knowledge to get closer to human accuracy, efficiency and robustness to variations.

Sparse representation of visual data for compression and compressed sensing - Ehsan Miandji 2018-11-23

The ongoing advances in computational photography have introduced a range of new imaging techniques for capturing multidimensional visual data such as light fields, BRDFs, BTFs, and more. A key challenge inherent to such imaging techniques is the large amount of high dimensional visual data that is produced, often requiring GBs, or even TBs, of storage. Moreover, the utilization of these datasets in real time applications poses many difficulties due to the large memory footprint. Furthermore, the acquisition of large-scale visual data is very challenging and expensive in most cases. This thesis makes several contributions with regards to acquisition, compression, and real time rendering of high dimensional visual data in computer graphics and imaging applications. Contributions of this thesis reside on the strong foundation of sparse representations. Numerous applications are presented that utilize sparse representations for compression and compressed sensing of visual data. Specifically, we present a single sensor light field camera design, a compressive rendering method, a real time precomputed photorealistic rendering technique, light field (video) compression and real time rendering, compressive BRDF capture, and more. Another key contribution of this thesis is a general framework for compression and compressed sensing of visual data, regardless of the dimensionality. As a result, any type of discrete visual data with arbitrary dimensionality can be captured, compressed, and rendered in real time. This thesis makes two theoretical contributions. In particular, uniqueness conditions for recovering a sparse signal under an ensemble of multidimensional dictionaries is presented. The theoretical results discussed

here are useful for designing efficient capturing devices for multidimensional visual data. Moreover, we derive the probability of successful recovery of a noisy sparse signal using OMP, one of the most widely used algorithms for solving compressed sensing problems.

Frontiers in Neurorobotics - Editor's Pick 2021 - Florian Röhrbein 2021-06-24

Modeling of Orientation Mapping Based on Optical Recordings of the Feline Visual Cortex - Danil M. Gorinevski 1998

High-Dimensional and Low-Quality Visual Information Processing - Yue Deng 2014-09-04

This thesis primarily focuses on how to carry out intelligent sensing and understand the high-dimensional and low-quality visual information. After exploring the inherent structures of the visual data, it proposes a number of computational models covering an extensive range of mathematical topics, including compressive sensing, graph theory, probabilistic learning and information theory. These computational models are also applied to address a number of real-world problems including biometric recognition, stereo signal reconstruction, natural scene parsing, and SAR image processing.

Experiment and Evaluation in Information Retrieval Models - K. Latha 2017-07-28

Experiment and Evaluation in Information Retrieval Models explores different algorithms for the application of evolutionary computation to the field of information retrieval (IR). As well as examining existing approaches to resolving some of the problems in this field, results obtained by researchers are critically evaluated in order to give readers a clear view of the topic. In addition, this book covers Algorithmic Solutions to the Problems in Advanced IR Concepts, including Feature Selection for Document Ranking, web page classification and recommendation, Facet Generation for Document Retrieval, Duplication Detection and seeker satisfaction in question answering community Portals. Written with students and researchers in the field on information retrieval in mind, this book is also a useful tool for researchers in the natural and social sciences

interested in the latest developments in the fast-moving subject area. Key features: Focusing on recent topics in Information Retrieval research, Experiment and Evaluation in Information Retrieval Models explores the following topics in detail: Searching in social media Using semantic annotations Ranking documents based on Facets Evaluating IR systems offline and online The role of evolutionary computation in IR Document and term clustering, Image retrieval Design of user profiles for IR Web page classification and recommendation Relevance feedback approach for Document and image retrieval

Coding Theory - Sudhakar Radhakrishnan
2020-03-11

This book is intended to attract the attention of practitioners and researchers in academia and industry interested in challenging paradigms of coding theory and computer vision. The chapters in this comprehensive reference explore the latest developments, methods, approaches, and applications of coding theory in a wide variety of fields and endeavours. This book is compiled with a view to provide researchers, academicians, and readers with an in-depth discussion of the latest advances in this field. It consists of twelve chapters from academicians, practitioners, and researchers from different disciplines of life. All the chapters are authored by various researchers around the world covering the field of coding theory and image and video processing. This book mainly focusses on researchers who can do quality research in the area of coding theory and image and video processing and related fields. Each chapter is an independent research study, which will motivate young researchers to think about. These twelve chapters are presented in three sections and will be an eye-opener for all who systematic researchers in these fields.

Curves and Surfaces - Pierre-Jean Laurent
2014-05-12

Curves and Surfaces provides information pertinent to the fundamental aspects of approximation theory with emphasis on approximation of images, surface compression, wavelets, and tomography. This book covers a variety of topics, including error estimates for multiquadratic interpolation, spline manifolds, and vector spline approximation. Organized into 77 chapters, this book begins with an overview

of the method, based on a local Taylor expansion of the final curve, for computing the parameter values. This text then presents a vector approximation based on general spline function theory. Other chapters consider a nonparametric technique for estimating under random censorship the amplitude of a change point in change point hazard models. This book discusses as well the algorithm for ray tracing rational parametric surfaces based on inversion and implicitization. The final chapter deals with the results concerning the norm of the interpolation operator and error estimates for a square domain. This book is a valuable resource for mathematicians.

Computer Vision - ECCV 2012 - Andrew Fitzgibbon 2012-09-26

The seven-volume set comprising LNCS volumes 7572-7578 constitutes the refereed proceedings of the 12th European Conference on Computer Vision, ECCV 2012, held in Florence, Italy, in October 2012. The 408 revised papers presented were carefully reviewed and selected from 1437 submissions. The papers are organized in topical sections on geometry, 2D and 3D shapes, 3D reconstruction, visual recognition and classification, visual features and image matching, visual monitoring: action and activities, models, optimisation, learning, visual tracking and image registration, photometry: lighting and colour, and image segmentation. *Advanced Computational Intelligence Methods for Processing Brain Imaging Data* - Kaijian Xia
2022-11-09

Low-Rank and Sparse Modeling for Visual Analysis - Yun Fu 2014-10-30

This book provides a view of low-rank and sparse computing, especially approximation, recovery, representation, scaling, coding, embedding and learning among unconstrained visual data. The book includes chapters covering multiple emerging topics in this new field. It links multiple popular research fields in Human-Centered Computing, Social Media, Image Classification, Pattern Recognition, Computer Vision, Big Data, and Human-Computer Interaction. Contains an overview of the low-rank and sparse modeling techniques for visual analysis by examining both theoretical analysis and real-world applications.

Sparse Representation, Modeling and Learning in Visual Recognition - Hong Cheng
2015-05-25

This unique text/reference presents a comprehensive review of the state of the art in sparse representations, modeling and learning. The book examines both the theoretical foundations and details of algorithm implementation, highlighting the practical application of compressed sensing research in visual recognition and computer vision. Topics and features: describes sparse recovery approaches, robust and efficient sparse representation, and large-scale visual recognition; covers feature representation and learning, sparsity induced similarity, and sparse representation and learning-based classifiers; discusses low-rank matrix approximation, graphical models in compressed sensing, collaborative representation-based classification, and high-dimensional nonlinear learning; includes appendices outlining additional computer programming resources, and explaining the essential mathematics required to understand the book.

Robotic Tactile Perception and Understanding - Huaping Liu 2018-03-20

This book introduces the challenges of robotic tactile perception and task understanding, and describes an advanced approach based on machine learning and sparse coding techniques. Further, a set of structured sparse coding models is developed to address the issues of dynamic tactile sensing. The book then proves that the proposed framework is effective in solving the problems of multi-finger tactile object recognition, multi-label tactile adjective recognition and multi-category material analysis, which are all challenging practical problems in the fields of robotics and automation. The proposed sparse coding model can be used to tackle the challenging visual-tactile fusion recognition problem, and the book develops a series of efficient optimization algorithms to implement the model. It is suitable as a reference book for graduate students with a basic knowledge of machine learning as well as professional researchers interested in robotic tactile perception and understanding, and machine learning.

Integrating Computational and Neural Findings

in Visual Object Perception - Judith C. Peters
2016-06-29

The articles in this Research Topic provide a state-of-the-art overview of the current progress in integrating computational and empirical research on visual object recognition.

Developments in this exciting multidisciplinary field have recently gained momentum: High performance computing enabled breakthroughs in computer vision and computational neuroscience. In parallel, innovative machine learning applications have recently become available for datamining the large-scale, high resolution brain data acquired with (ultra-high field) fMRI and dense multi-unit recordings. Finally, new techniques to integrate such rich simulated and empirical datasets for direct model testing could aid the development of a comprehensive brain model. We hope that this Research Topic contributes to these encouraging advances and inspires future research avenues in computational and empirical neuroscience.

Visual Pattern Discovery and Recognition - Hongxing Wang 2017-06-14

This book presents a systematic study of visual pattern discovery, from unsupervised to semi-supervised manner approaches, and from dealing with a single feature to multiple types of features. Furthermore, it discusses the potential applications of discovering visual patterns for visual data analytics, including visual search, object and scene recognition. It is intended as a reference book for advanced undergraduates or postgraduate students who are interested in visual data analytics, enabling them to quickly access the research world and acquire a systematic methodology rather than a few isolated techniques to analyze visual data with large variations. It is also inspiring for researchers working in computer vision and pattern recognition fields. Basic knowledge of linear algebra, computer vision and pattern recognition would be helpful to readers.

Remote Sensing for Target Object Detection and Identification - Gemine Vivone 2020-03-06

Target object detection and identification are among the primary uses for a remote sensing system. This is crucial in several fields, including environmental and urban monitoring, hazard and disaster management, and defense and military. In recent years, these analyses have

used the tremendous amount of data acquired by sensors mounted on satellite, airborne, and unmanned aerial vehicle (UAV) platforms. This book promotes papers exploiting different remote sensing data for target object detection and identification, such as synthetic aperture radar (SAR) imaging and multispectral and hyperspectral imaging. Several cutting-edge contributions, which provide examples of how to select of a technology or another depending on the specific application, will be detailed.

Activity Monitoring by Multiple Distributed Sensing - Pier Luigi Mazzeo 2014-11-19

This book constitutes the thoroughly refereed post-conference proceedings of the Second International Workshop on Activity Monitoring by Multiple Distributed Sensing, AMMDS 2014, held in Stockholm, Sweden, in August 2014, as a satellite event of ICPR 2014, the 22nd International Conference on Pattern Recognition. The 9 revised full papers included in the volume investigate the challenges that arise when distributed sensor networks are used to track, monitor, and understand the activity, intent, and motives of human beings. Application areas include human-computer interaction, user interface design, robot learning, and surveillance.

Advances in Multimedia Information Processing - PCM 2017 - Bing Zeng 2018-05-09

The two-volume set LNCS 10735 and 10736 constitutes the thoroughly refereed proceedings of the 18th Pacific-Rim Conference on Multimedia, PCM 2017, held in Harbin, China, in September 2017. The 184 full papers presented were carefully reviewed and selected from 264 submissions. The papers are organized in topical sections on: Best Paper Candidate; Video Coding; Image Super-resolution, Deblurring, and Dehazing; Person Identity and Emotion; Tracking and Action Recognition; Detection and Classification; Multimedia Signal Reconstruction and Recovery; Text and Line Detection/Recognition; Social Media; 3D and Panoramic Vision; Deep Learning for Signal Processing and Understanding; Large-Scale Multimedia Affective Computing; Sensor-enhanced Multimedia Systems; Content Analysis; Coding, Compression, Transmission, and Processing.

Data Clustering - Charu C. Aggarwal 2018-09-03
Research on the problem of clustering tends to be fragmented across the pattern recognition, database, data mining, and machine learning communities. Addressing this problem in a unified way, Data Clustering: Algorithms and Applications provides complete coverage of the entire area of clustering, from basic methods to more refined and complex data clustering approaches. It pays special attention to recent issues in graphs, social networks, and other domains. The book focuses on three primary aspects of data clustering: Methods, describing key techniques commonly used for clustering, such as feature selection, agglomerative clustering, partitional clustering, density-based clustering, probabilistic clustering, grid-based clustering, spectral clustering, and nonnegative matrix factorization Domains, covering methods used for different domains of data, such as categorical data, text data, multimedia data, graph data, biological data, stream data, uncertain data, time series clustering, high-dimensional clustering, and big data Variations and Insights, discussing important variations of the clustering process, such as semisupervised clustering, interactive clustering, multiview clustering, cluster ensembles, and cluster validation In this book, top researchers from around the world explore the characteristics of clustering problems in a variety of application areas. They also explain how to glean detailed insight from the clustering process—including how to verify the quality of the underlying clusters—through supervision, human intervention, or the automated generation of alternative clusters.

Artificial Neural Networks and Machine Learning - ICANN 2017 - Alessandra Lintas 2017-10-24

The two volume set, LNCS 10613 and 10614, constitutes the proceedings of then 26th International Conference on Artificial Neural Networks, ICANN 2017, held in Alghero, Italy, in September 2017. The 128 full papers included in this volume were carefully reviewed and selected from 270 submissions. They were organized in topical sections named: From Perception to Action; From Neurons to Networks; Brain Imaging; Recurrent Neural Networks; Neuromorphic Hardware; Brain

Topology and Dynamics; Neural Networks Meet Natural and Environmental Sciences; Convolutional Neural Networks; Games and Strategy; Representation and Classification; Clustering; Learning from Data Streams and Time Series; Image Processing and Medical Applications; Advances in Machine Learning. There are 63 short paper abstracts that are included in the back matter of the volume.

Intelligence Science and Big Data Engineering. Visual Data Engineering - Zhen Cui 2019-11-28

The two volumes LNCS 11935 and 11936 constitute the proceedings of the 9th International Conference on Intelligence Science and Big Data Engineering, IScIDE 2019, held in Nanjing, China, in October 2019. The 84 full papers presented were carefully reviewed and selected from 252 submissions. The papers are organized in two parts: visual data engineering; and big data and machine learning. They cover a large range of topics including information theoretic and Bayesian approaches, probabilistic graphical models, big data analysis, neural networks and neuro-informatics, bioinformatics, computational biology and brain-computer interfaces, as well as advances in fundamental pattern recognition techniques relevant to image processing, computer vision and machine learning.

Advances in Neural Information Processing Systems 19 - Bernhard Schölkopf 2007

The annual Neural Information Processing Systems (NIPS) conference is the flagship meeting on neural computation and machine learning. This volume contains the papers presented at the December 2006 meeting, held in Vancouver.

Sparse Representation, Modeling and Learning in Visual Recognition - Hong Cheng 2016-10-09

This unique text/reference presents a comprehensive review of the state of the art in sparse representations, modeling and learning. The book examines both the theoretical foundations and details of algorithm implementation, highlighting the practical application of compressed sensing research in visual recognition and computer vision. Topics and features: describes sparse recovery approaches, robust and efficient sparse representation, and large-scale visual recognition; covers feature representation and

learning, sparsity induced similarity, and sparse representation and learning-based classifiers; discusses low-rank matrix approximation, graphical models in compressed sensing, collaborative representation-based classification, and high-dimensional nonlinear learning; includes appendices outlining additional computer programming resources, and explaining the essential mathematics required to understand the book.

Computer Vision for Multimedia

Applications: Methods and Solutions - Wang, Jinjun 2010-10-31

"This book presents the latest developments in computer vision methods applicable to various problems in multimedia computing, including new ideas, as well as problems in computer vision and multimedia computing"--Provided by publisher.

Deep Learning through Sparse and Low-Rank Modeling - Zhangyang Wang 2019-04-26

Deep Learning through Sparse Representation and Low-Rank Modeling bridges classical sparse and low rank models-those that emphasize problem-specific Interpretability-with recent deep network models that have enabled a larger learning capacity and better utilization of Big Data. It shows how the toolkit of deep learning is closely tied with the sparse/low rank methods and algorithms, providing a rich variety of theoretical and analytic tools to guide the design and interpretation of deep learning models. The development of the theory and models is supported by a wide variety of applications in computer vision, machine learning, signal processing, and data mining. This book will be highly useful for researchers, graduate students and practitioners working in the fields of computer vision, machine learning, signal processing, optimization and statistics.

Combines classical sparse and low-rank models and algorithms with the latest advances in deep learning networks Shows how the structure and algorithms of sparse and low-rank methods improves the performance and interpretability of Deep Learning models Provides tactics on how to build and apply customized deep learning models for various applications

Advances in Visual Computing - Richard Boyle 2010-11-19

It is with great pleasure that we present the

proceedings of the 6th International Symposium on Visual Computing (ISVC 2010), which was held in Las Vegas, Nevada. ISVC provides a common umbrella for the four main areas of visual computing including vision, graphics, visualization, and virtual reality. The goal is to provide a forum for researchers, scientists, engineers, and practitioners throughout the world to present their latest research findings, ideas, developments, and applications in the broader area of visual computing. This year, the program consisted of 14 oral sessions, one poster session, 7 special tracks, and 6 keynote presentations. The response to the call for papers was very good; we received over 300 submissions for the main symposium from which we accepted 93 papers for oral presentation and 73 papers for poster presentation. Special track papers were solicited separately through the Organizing and Program Committees of each track. A total of 44 papers were accepted for oral presentation and 6 papers for poster presentation in the special tracks.

Biometrics: Concepts, Methodologies, Tools, and Applications

Management Association, Information Resources 2016-08-30

Security and authentication issues are surging to the forefront of the research realm in global society. As technology continues to evolve, individuals are finding it easier to infiltrate various forums and facilities where they can illegally obtain information and access. By implementing biometric authentications to these forums, users are able to prevent attacks on their privacy and security. *Biometrics: Concepts, Methodologies, Tools, and Applications* is a multi-volume publication highlighting critical topics related to access control, user identification, and surveillance technologies. Featuring emergent research on the issues and challenges in security and privacy, various forms of user authentication, biometric applications to image processing and computer vision, and security applications within the field, this publication is an ideal reference source for researchers, engineers, technology developers, students, and security specialists.

Dictionary Learning in Visual Computing

Qiang Zhang 2015-05-01

The last few years have witnessed fast development on dictionary learning approaches

for a set of visual computing tasks, largely due to their utilization in developing new techniques based on sparse representation. Compared with conventional techniques employing manually defined dictionaries, such as Fourier Transform and Wavelet Transform, dictionary learning aims at obtaining a dictionary adaptively from the data so as to support optimal sparse representation of the data. In contrast to conventional clustering algorithms like K-means, where a data point is associated with only one cluster center, in a dictionary-based representation, a data point can be associated with a small set of dictionary atoms. Thus, dictionary learning provides a more flexible representation of data and may have the potential to capture more relevant features from the original feature space of the data. One of the early algorithms for dictionary learning is K-SVD. In recent years, many variations/extensions of K-SVD and other new algorithms have been proposed, with some aiming at adding discriminative capability to the dictionary, and some attempting to model the relationship of multiple dictionaries. One prominent application of dictionary learning is in the general field of visual computing, where long-standing challenges have seen promising new solutions based on sparse representation with learned dictionaries. With a timely review of recent advances of dictionary learning in visual computing, covering the most recent literature with an emphasis on papers after 2008, this book provides a systematic presentation of the general methodologies, specific algorithms, and examples of applications for those who wish to have a quick start on this subject.

Cognitive and Neural Modelling for Visual Information Representation and Memorization - Limiao Deng 2022-04-25

Focusing on how visual information is represented, stored and extracted in the human brain, this book uses cognitive neural modeling in order to show how visual information is represented and memorized in the brain. Breaking through traditional visual information processing methods, the author combines our understanding of perception and memory from the human brain with computer vision technology, and provides a new approach for image recognition and classification. While

biological visual cognition models and human brain memory models are established, applications such as pest recognition and carrot detection are also involved in this book. Given the range of topics covered, this book is a valuable resource for students, researchers and practitioners interested in the rapidly evolving field of neurocomputing, computer vision and machine learning.

Pattern Recognition and Computer Vision - Jian-Huang Lai 2018-11-01

The four-volume set LNCS 11056, 110257, 11258, and 11073 constitutes the refereed proceedings of the First Chinese Conference on Pattern Recognition and Computer Vision, PRCV 2018, held in Guangzhou, China, in November 2018. The 179 revised full papers presented were carefully reviewed and selected from 399 submissions. The papers have been organized in the following topical sections: Part I: Biometrics, Computer Vision Application. Part II: Deep Learning. Part III: Document Analysis, Face Recognition and Analysis, Feature Extraction and Selection, Machine Learning. Part IV: Object Detection and Tracking, Performance Evaluation and Database, Remote Sensing.

ECAI 2016 - G.A. Kaminka 2016-08-24

Artificial Intelligence continues to be one of the most exciting and fast-developing fields of computer science. This book presents the 177 long papers and 123 short papers accepted for ECAI 2016, the latest edition of the biennial European Conference on Artificial Intelligence, Europe's premier venue for presenting scientific results in AI. The conference was held in The Hague, the Netherlands, from August 29 to September 2, 2016. ECAI 2016 also incorporated the conference on Prestigious Applications of Intelligent Systems (PAIS) 2016, and the Starting AI Researcher Symposium (STAIRS). The papers from PAIS are included in this volume; the papers from STAIRS are published in a separate volume in the Frontiers in Artificial Intelligence and Applications (FAIA) series. Organized by the European Association for Artificial Intelligence (EurAI) and the Benelux Association for Artificial Intelligence (BNVKI), the ECAI conference provides an opportunity for researchers to present and hear about the very best research in contemporary AI. This proceedings will be of interest to all those

seeking an overview of the very latest innovations and developments in this field.

Online Visual Tracking - Huchuan Lu 2019-05-30

This book presents the state of the art in online visual tracking, including the motivations, practical algorithms, and experimental evaluations. Visual tracking remains a highly active area of research in Computer Vision and the performance under complex scenarios has substantially improved, driven by the high demand in connection with real-world applications and the recent advances in machine learning. A large variety of new algorithms have been proposed in the literature over the last two decades, with mixed success. Chapters 1 to 6 introduce readers to tracking methods based on online learning algorithms, including sparse representation, dictionary learning, hashing codes, local model, and model fusion. In Chapter 7, visual tracking is formulated as a foreground/background segmentation problem, and tracking methods based on superpixels and end-to-end deep networks are presented. In turn, Chapters 8 and 9 introduce the cutting-edge tracking methods based on correlation filter and deep learning. Chapter 10 summarizes the book and points out potential future research directions for visual tracking. The book is self-contained and suited for all researchers, professionals and postgraduate students working in the fields of computer vision, pattern recognition, and machine learning. It will help these readers grasp the insights provided by cutting-edge research, and benefit from the practical techniques available for designing effective visual tracking algorithms. Further, the source codes or results of most algorithms in the book are provided at an accompanying website.

Image and Graphics - Yao Zhao 2017-12-29

This three-volume set LNCS 10666, 10667, and 10668 constitutes the refereed conference proceedings of the 9th International Conference on Image and Graphics, ICIG 2017, held in Shanghai, China, in September 2017. The 172 full papers were selected from 370 submissions and focus on advances of theory, techniques and algorithms as well as innovative technologies of image, video and graphics processing and fostering innovation, entrepreneurship, and networking.

Visual Sensors - Oscar Reinoso 2020-03-27

Visual sensors are able to capture a large quantity of information from the environment around them. A wide variety of visual systems can be found, from the classical monocular systems to omnidirectional, RGB-D, and more sophisticated 3D systems. Every configuration presents some specific characteristics that make them useful for solving different problems. Their

range of applications is wide and varied, including robotics, industry, agriculture, quality control, visual inspection, surveillance, autonomous driving, and navigation aid systems. In this book, several problems that employ visual sensors are presented. Among them, we highlight visual SLAM, image retrieval, manipulation, calibration, object recognition, navigation, etc.