A Hierarchical Feature Representation For Phonetic

Documents the conference with 57 papers. Among the topics are a multicriteria decision making approach to concurrent engineering in product design, a morphological heuristic for scheduling, multiple-viewpoint computer-aided design models for automotive body-in-white design, product development pract
A Hierarchical Feature Representation for Phonetic ClassificationDeep Learning EssentialsYour hands-on guide to the fundamentals of deep learning and neural network modelingPackt Publishing Ltd
Smart Computational Intelligence in Biomedical and Health Informatics presents state-of-the-art innovations; research, design, and implementation of methodological and algorithmic solutions to data processing problems, including analysis of evolving trends in health informatics and computer-aided diagnosis. This book describes practical, applications-led research regarding the use of methods and devices in clinical diagnosis, disease prevention, and patient monitoring and management. It also covers simulation and modeling, measurement and control, analysis, information extraction and monitoring of physiological data in clinical medicine and the biological sciences. FEATURES Covers evolutionary approaches to solve optimization problems in biomedical engineering Discusses IoT, Cloud computing, and data analytics in healthcare informatics Provides computational intelligence-based solution for diagnosis of diseases Reviews modelling and simulations in designing of biomedical equipment Promotes machine learning-based approaches to improvements in biomedical engineering problems This book is for researchers, graduate students in healthcare, biomedical engineers, and those interested in health informatics, computational intelligence, and machine learning.
The 2010 edition of the European Conference on Computer Vision was held in Heraklion, Crete. The call for papers attracted an absolute record of 1,174 submissions. We describe here the selection of the accepted papers: Thirty-eight area chairs were selected coming from Europe (18), USA and Canada (16), and Asia (4). Their selection was based on the following criteria: (1) Researchers who had served at least two times as Area Chairs within the past two years at major vision conferences were excluded; (2) Researchers who served as Area Chairs at the 2010 Computer Vision and Pattern Recognition were also excluded (exception: ECCV 2012 Program Chairs); (3) Minimization of overlap introduced by Area Chairs being former student and advisors; (4) 20% of the Area Chairs had never served before in a major conference; (5) The Area Chair selection process made all possible efforts to achieve a reasonable geographic distribution between countries, thematic areas and trends in computer vision. Each Area Chair was assigned by the Program Chairs between 28–32 papers. Based on paper content, the Area Chair recommended up to seven potential reviewers per paper. Such assignment was made using all reviewers in the database including the conflicting ones. The Program Chairs manually entered the missing conflict domains of approximately 300 reviewers. Based on the recommendation of the Area Chairs, three reviewers were selected per paper (with at least one being of the top three suggestions), with 99.
Strip Trees
Applications to Mobile Robots
Probabilistic and Biologically Inspired Feature Representations
Sparse, Hierarchical and Shared-factors Priors for Representation Learning
Hierarchical Neural Networks for Image Interpretation
Database Systems for Advanced Applications
Proceedings of Second International Conference on Smart Energy and Communication
Augmenting Neurological Disorder Prediction and Rehabilitation Using Artificial Intelligence focuses on how the neurosciences can benefit from advances in AI, especially in areas such as medical image analysis for the improved diagnosis of Alzheimer’s disease, early detection of acute neurologic events, prediction of stroke, medical image segmentation for quantitative evaluation of neuroanatomy and vasculature, diagnosis of Alzheimer’s Disease, autism spectrum disorder, and other key neurological disorders. Chapters also focus on how AI can help in predicting stroke recovery, and the use of Machine Learning and AI in personalizing stroke rehabilitation therapy. Other sections delve into Epilepsy and the use of Machine Learning techniques to detect epileptogenic lesions on MRIs and how to understand neural networks. Provides readers with an understanding on the key applications of artificial intelligence and machine learning in the diagnosis and treatment of the most important neurological disorders Integrates recent advancements of artificial intelligence and machine learning to the evaluation of large amounts of clinical data for the early detection of disorders such as Alzheimer’s Disease, autism spectrum disorder, Multiple Sclerosis, headache disorder, Epilepsy, and stroke Provides readers with illustrative examples of how artificial intelligence can be applied to outcome prediction, neurorehabilitation and clinical exams, including a wide range of case studies in predicting and classifying neurological disorders
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.

Deep learning and image processing are two areas of great interest to academics and industry professionals alike. The areas of application of these two disciplines range widely, encompassing fields such as medicine, robotics, and security and surveillance. The aim of this book, 'Deep Learning for Image Processing Applications', is to offer concepts from these two areas in the same platform, and the book brings together the shared ideas of professionals from academia and research about problems and solutions relating to the multifaceted aspects of the two disciplines. The first chapter provides an introduction to deep learning, and serves as the basis for much of what follows in the subsequent chapters, which cover subjects including: the application of deep neural networks for image classification; hand gesture recognition in robotics; deep learning techniques for image retrieval; disease detection using deep learning techniques; and the comparative analysis of deep data and big data. The book will be of interest to all those whose work involves the use of deep learning and image processing techniques.

This volume constitutes the refereed proceedings of the Second International Conference on Scale-Space Theories in Computer Vision, Scale-Space'99, held in Corfu, Greece, in September 1999. The 36 revised full papers and the 18 revised posters presented in the book were carefully reviewed and selected from 66 high-quality submissions. The book addresses all current aspects of this young and active field, in particular geometric Image flows, nonlinear diffusion, functional minimization, linear scale-space, etc.

Third International Conference on Advances in Pattern Recognition, ICAPR 2005, Bath, UK, August 22-25, 2005, Part II

Second International Conference, Scale-Space'99, Corfu, Greece, September 26-27, 1999, Proceedings

Rough Sets

Smart Computational Intelligence in Biomedical and Health Informatics

Pattern Recognition and Computer Vision

Augmenting Neurological Disorder Prediction and Rehabilitation Using Artificial Intelligence

Second International Conference, RTIP2R 2018, Solapur, India, December 21–22, 2018, Revised Selected Papers, Part II

Human performance in visual perception by far exceeds the performance of contemporary computer vision systems. While humans are able to perceive their environment almost instantly and reliably under a wide range of conditions, computer vision systems work well only under controlled conditions in limited domains. This book sets out to reproduce the robustness and speed of human perception by proposing a hierarchical neural network architecture for iterative image interpretation. The proposed architecture can be trained using unsupervised and supervised learning techniques. Applications of the proposed architecture are illustrated using small networks. Furthermore, several larger networks were trained to perform various nontrivial computer vision tasks.

CSSE2014 proceeding tends to collect the most up-to-date, comprehensive, and worldwide state-of-art knowledge on Computer Science and Software Engineering. All the accepted papers have been submitted to strict peer-review by 2–4 expert referees, and selected based on originality, significance and clarity for the purpose of the conference. The conference program is extremely rich, profound and featuring high-impact presentations of selected papers and additional late-breaking contributions. We sincerely hope that the conference would not only show the participants a broad overview of the latest research results on related fields, but also provide them with a significant platform for academic connection and exchange. The Technical Program Committee members have been working very hard to meet the deadline of review. The final conference program consists of 126 papers divided into 4 sessions.

This unique text helps make sense of big data in engineering applications using tools and techniques from signal processing. It presents fundamental signal processing theories and software implementations, reviews current research trends and challenges, and describes the techniques used for analysis, design and optimization. Readers will learn about key theoretical issues such as data modelling and representation, scalable and low-complexity information processing and optimization, tensor and sublinear algorithms, and deep learning and software architecture, and their application to a wide range of engineering scenarios. Applications discussed in detail include wireless networking, smart grid systems, and sensor networks and cloud computing. This is the ideal text for researchers and practising engineers wanting to solve practical problems involving

large amounts of data, and for students looking to grasp the fundamentals of big data analytics.
This three-book set constitutes the refereed proceedings of the Second International Conference on Recent Trends in Image Processing and Pattern Recognition (RTIP2R) 2018, held in Solapur, India, in December 2018. The 173 revised full papers presented were carefully reviewed and selected from 374 submissions. The papers are organized in topical sections in the tree volumes. Part I: computer vision and pattern recognition; machine learning and applications; and image processing. Part II: healthcare and medical imaging; biometrics and applications. Part III: document image analysis; image analysis in agriculture; and data mining, information retrieval and applications.
Hierarchical Feature Learning
A Hierarchical Feature Representation for Phonetic Classification
Linguistic Modeling of Information and Markup Languages
Neural Information Processing

Models and Applications
Contributions to Language Technology
It is both an honor and a pleasure to hold the 27th Annual Meeting of the German Association for Pattern Recognition, DAGM 2005, at the Vienna U- versity of Technology, Austria, organized by the Pattern Recognition and Image Processing (PRIP) Group. We received 122 contributions of which we were able to accept 29 as oral presentations and 31 as posters. Each paper received three reviews, upon which decisions were made based on correctness, presentation, technical depth, scienti?c signi?cance and originality. The selection as oral or poster presentation does not signify a quality grading but re?ects attractiveness to the audience which is also re?ected in the order of appearance of papers in these proceedings. The papers are printed in the same order as presented at the symposium and posters are integrated in the corresponding thematic session. In putting these proceedings together, many people played signi?cant roles which we would like to acknowledge. First of all our thanks go to the authors who contributed their work to the symposium. Second, we are grateful for the dedicated work of the 38 members of the Program Committee for their e?ort in evaluating the submitted papers and inprovidingthe necessarydecisionsupport information and the valuable feedback for the authors. Furthermore, the P- gram Committee awarded prizes for the best papers, and we want to sincerely thank the donors. We were honored to have the following three invited speakers at the conf- ence: - Jan P.
Feature representation is a central concern of today's machine learning systems. A proper representation can facilitate a complex learning task. This is the case when for instance the representation has low dimensionality and consists of high-level characteristics. But how can we determine if a representation is adequate for a learning task? Recent work suggests that it is better to see the choice of representation as a learning problem in itself. This is called Representation Learning. This thesis presents a series of contributions aimed at improving the quality of the learned representations. The first contribution elaborates a comparative study of Sparse Dictionary Learning (SDL) approaches on the problem of grasp detection (for robotic grasping) and provides an empirical analysis of their advantages and disadvantages. The second contribution proposes a Convolutional Neural Network (CNN) architecture for grasp detection and compares it to SDL. Then, the third contribution elaborates a new parametric activation function and validates it experimentally. Finally, the fourth contribution details a new soft parameter sharing mechanism for multitasking learning.
Feature engineering plays a vital role in big data analytics. Machine learning and data mining algorithms cannot work without data. Little can be achieved if there are few features to represent the underlying data objects, and the quality of results of those algorithms largely depends on the quality of the available features. Feature Engineering for Machine Learning and Data Analytics provides a comprehensive introduction to feature engineering, including feature generation, feature extraction, feature transformation, feature selection, and feature analysis and evaluation. The book presents key concepts, methods, examples, and applications, as well as chapters on feature engineering for major data types such as texts, images, sequences, time series, graphs, streaming data, software engineering data, Twitter data, and social media data. It also contains generic feature generation approaches, as well as methods for generating tried-and-tested, hand-crafted, domain-specific features. The first chapter defines the concepts of features and feature engineering, offers an overview of the book, and provides pointers to topics

not covered in this book. The next six chapters are devoted to feature engineering, including feature generation for specific data types. The subsequent four chapters cover generic approaches for feature engineering, namely feature selection, feature transformation based feature engineering, deep learning based feature engineering, and pattern based feature generation and engineering. The last three chapters discuss feature engineering for social bot detection, software management, and Twitter-based applications respectively. This book can be used as a reference for data analysts, big data scientists, data preprocessing workers, project managers, project developers, prediction modelers, professors, researchers, graduate students, and upper level undergraduate students. It can also be used as the primary text for courses on feature engineering, or as a supplement for courses on machine learning, data mining, and big data analytics.

The success of many tasks depends on good feature representation which is often domain-specific and hand-crafted requiring substantial human effort. Such feature representation is not general, i.e. unsuitable for even the same task across multiple domains, let alone different tasks.To address these issues, a multilayered convergent neural architecture is presented for learning from repeating spatially and temporally coincident patterns in data at multiple levels of abstraction. The bottom-up weights in each layer are learned to encode a hierarchy of overcomplete and sparse feature dictionaries from space- and time-varying sensory data. Two algorithms are investigated: recursive layer-by-layer spherical clustering and sparse coding to learn feature hierarchies. The model scales to full-sized high-dimensional input data and to an arbitrary number of layers thereby having the capability to capture features at any level of abstraction. The model learns features that correspond to objects in higher layers and object-parts in lower layers.Learning features invariant to arbitrary transformations in the data is a requirement for any effective and efficient representation system, biological or artificial. Each layer in the proposed network is composed of simple and complex sublayers motivated by the layered organization of the primary visual cortex. When exposed to natural videos, the model develops simple and complex cell-like receptive field properties. The model can predict by learning lateral connections among the simple sublayer neurons. A topographic map to their spatial features emerges by minimizing the wiring length simultaneously with feature learning.The model is general-purpose, unsupervised and online. Operations in each layer of the model can be implemented in parallelized hardware, making it very efficient for real world applications. .

18th International Conference, Munich, Germany, October 5–9, 2015, Proceedings, Part III

Computer Vision -- ECCV 2010

Signal Processing and Networking for Big Data Applications

Second Chinese Conference, PRCV 2019, Xi'an, China, November 8–11, 2019, Proceedings, Part II

International Joint Conference, IJCRS 2021, Bratislava, Slovakia, September 19–24, 2021, Proceedings

Application of Data Mining to the Biology of Ageing

Large Scale Hierarchical Classification: State of the Art

This SpringerBrief covers the technical material related to large scale hierarchical classification (LSHC). HC is an important machine learning problem that has been researched and explored extensively in the past few years. In this book, the authors provide a comprehensive overview of various state-of-the-art existing methods and algorithms that were developed to solve the HC problem in large scale domains. Several challenges faced by LSHC is discussed in detail such as: 1. High imbalance between classes at different levels of the hierarchy 2. Incorporating relationships during model learning leads to optimization issues 3. Feature selection 4. Scalability due to large number of examples, features and classes 5. Hierarchical inconsistencies 6. Error propagation due to multiple decisions involved in making predictions for top-down methods The brief also demonstrates how multiple hierarchies can be leveraged for improving the HC performance using different Multi-Task Learning (MTL) frameworks. The purpose of this book is two-fold: 1. Help novice researchers/beginners to get up to speed by providing a comprehensive overview of several existing techniques. 2. Provide several research directions that have not yet been explored extensively to advance the research boundaries in HC. New approaches discussed in this book include detailed information corresponding to the hierarchical inconsistencies, multi-task learning and feature selection for HC. Its results are highly competitive with the state-of-the-art approaches in the literature.

Get to grips with the essentials of deep learning by leveraging the power of Python Key Features Your one-stop solution to get started with the essentials of deep learning and neural network modeling Train different kinds of neural networks to tackle various problems in Natural Language Processing, computer vision, speech recognition, and more Covers popular Python libraries such as Tensorflow, Keras, and more, along with tips on training, deploying and optimizing your deep learning models in the best possible manner Book Description Deep Learning a trending topic in the field of Artificial Intelligence today and can be considered to be an advanced

form of machine learning, which is quite tricky to master. This book will help you take your first steps in training efficient deep learning models and applying them in various practical scenarios. You will model, train, and deploy different kinds of neural networks such as Convolutional Neural Network, Recurrent Neural Network, and will see some of their applications in real-world domains including computer vision, natural language processing, speech recognition, and so on. You will build practical projects such as chatbots, implement reinforcement learning to build smart games, and develop expert systems for image captioning and processing. Popular Python library such as TensorFlow is used in this book to build the models. This book also covers solutions for different problems you might come across while training models, such as noisy datasets, small datasets, and more. This book does not assume any prior knowledge of deep learning. By the end of this book, you will have a firm understanding of the basics of deep learning and neural network modeling, along with their practical applications. What you will learn Get to grips with the core concepts of deep learning and neural networks Set up deep learning library such as TensorFlow Fine-tune your deep learning models for NLP and Computer Vision applications Unify different information sources, such as images, text, and speech through deep learning Optimize and fine-tune your deep learning models for better performance Train a deep reinforcement learning model that plays a game better than humans Learn how to make your models get the best out of your GPU or CPU Who this book is for Aspiring data scientists and machine learning experts who have limited or no exposure to deep learning will find this book to be very useful. If you are looking for a resource that gets you up and running with the fundamentals of deep learning and neural networks, this book is for you. As the models in the book are trained using the popular Python-based libraries such as Tensorflow and Keras, it would be useful to have sound programming knowledge of Python.

This LNCS volume contains the papers presented at the 3rd International Conference on Advances in Pattern Recognition (ICAPR 2005) organized in August, 2005 in the beautiful city of Bath, UK.

The three-volume set LNCS 13245, 13246 and 13247 constitutes the proceedings of the 26th International Conference on Database Systems for Advanced Applications, DASFAA 2022, held online, in April 2021. The total of 72 full papers, along with 76 short papers, are presented in this three-volume set was carefully reviewed and selected from 543 submissions. Additionally, 13 industrial papers, 9 demo papers and 2 PhD consortium papers are included. The conference was planned to take place in Hyderabad, India, but it was held virtually due to the COVID-19 pandemic.

Hierarchical Object Representations in the Visual Cortex and Computer Vision

International Conference on Computer Science and Software Engineering (CSSE 2014)

Pattern Recognition and Image Analysis

Deep Learning for Image Processing Applications

ICSEC 2020

Learning Representation for Multi-View Data Analysis

11th European Conference on Computer Vision, Heraklion, Crete, Greece, September 5-11, 2010, Proceedings, Part II

Besides learning the low-level local features, higher level representations are further designed to be learned in the context of applications. The data-driven concept representations and sparse representation of the events are learned for complex event recognition; the representations for object body parts and structures are learned for object detection in videos; and the relational motion features and similarity metrics between video pairs are learned simultaneously for action verification. Second, in order to learn discriminative and compact features, we propose a new feature learning method using a deep neural network based on auto encoders. It differs from the existing unsupervised feature learning methods in two ways: first it optimizes both discriminative and generative properties of the features simultaneously, which gives our features a better discriminative ability. Second, our learned features are more compact, while the unsupervised feature learning methods usually learn a redundant set of over-complete features. Extensive experiments with quantitative and qualitative results on the tasks of human detection and action verification demonstrate the superiority of our proposed models.

This book equips readers to handle complex multi-view data representation, centered around several major visual applications, sharing many tips and insights through a unified learning framework. This framework is able to model most existing multi-view learning and domain adaptation, enriching readers' understanding from their similarity, and differences based on data organization and problem settings, as well as the research goal. A comprehensive review exhaustively provides the key recent research on multi-view data analysis, i.e., multi-view clustering, multi-view classification, zero-shot learning, and domain adaption. More practical challenges in multi-view data analysis are discussed including incomplete, unbalanced and large-scale multi-view learning. Learning Representation for Multi-View Data Analysis covers a wide range of applications in the research fields of big data, human-centered computing, pattern recognition, digital marketing, web mining, and computer vision.

This book presents the proceedings of the 24th European Conference on Artificial Intelligence (ECAI 2020), held in Santiago de Compostela, Spain, from 29 August to 8 September 2020. The conference was postponed from June, and much of it conducted online due to the COVID-19 restrictions. The conference is one of the principal occasions for researchers and practitioners of AI to meet and discuss the latest trends and challenges in all fields of AI and to demonstrate innovative applications and uses of advanced AI technology. The book also includes the proceedings of the 10th Conference on Prestigious Applications of Artificial Intelligence (PAIS 2020) held at the same time. A record number of more than 1,700 submissions was received for ECAI 2020, of which 1,443 were reviewed. Of these, 361 full-papers and 36 highlight

papers were accepted (an acceptance rate of 25% for full-papers and 45% for highlight papers). The book is divided into three sections: ECAI full papers; ECAI highlight papers; and PAIS papers. The topics of these papers cover all aspects of AI, including Agent-based and Multi-agent Systems; Computational Intelligence; Constraints and Satisfiability; Games and Virtual Environments; Heuristic Search; Human Aspects in AI; Information Retrieval and Filtering; Knowledge Representation and Reasoning; Machine Learning; Multidisciplinary Topics and Applications; Natural Language Processing; Planning and Scheduling; Robotics; Safe, Explainable, and Trustworthy AI; Semantic Technologies; Uncertainty in AI; and Vision. The book will be of interest to all those whose work involves the use of AI technology.

Under the title "Probabilistic and Biologically Inspired Feature Representations," this text collects a substantial amount of work on the topic of channel representations. Channel representations are a biologically motivated, wavelet-like approach to visual feature descriptors: they are local and compact, they form a computational framework, and the represented information can be reconstructed. The first property is shared with many histogram- and signature-based descriptors, the latter property with the related concept of population codes. In their unique combination of properties, channel representations become a visual Swiss army knife—they can be used for image enhancement, visual object tracking, as 2D and 3D descriptors, and for pose estimation. In the chapters of this text, the framework of channel representations will be introduced and its attributes will be elaborated, as well as further insight into its probabilistic modeling and algorithmic implementation will be given. Channel representations are a useful toolbox to represent visual information for machine learning, as they establish a generic way to compute popular descriptors such as HOG, SIFT, and SHOT. Even in an age of deep learning, they provide a good compromise between hand-designed descriptors and a-priori structureless feature spaces as seen in the layers of deep networks.

Multi-Hierarchical Representation of Large-Scale Space

14th International Confernce, ICONIP 2007, Kitakyushu, Japan, November 13-16, 2007, Revised Selected Papers

Censorship, Surveillance, and Privacy: Concepts, Methodologies, Tools, and Applications

Graph Representation Learning

13th International Conference, ADMA 2017, Singapore, November 5–6, 2017, Proceedings

Unsupervised Feature Learning Via Sparse Hierarchical Representations

CE97 Proceedings

This book gathers selected papers presented at the 2nd International Conference on Smart Energy and Communication (ICSEC 2020), held at Poornima Institute of Engineering and Technology, Jaipur, India, on March 20-21, 2020. It covers a range of topics in electronics and communication engineering and electrical engineering, including analog circuit design, image processing, wireless and microwave communication, optoelectronics and photonic devices, nano-electronics, renewable energy, smart grid, power systems and industry applications.

The three-volume set LNCS 9349, 9350, and 9351 constitutes the refereed proceedings of the 18th International Conference on Medical Image Computing and Computer-Assisted Intervention, MICCAI 2015, held in Munich, Germany, in October 2015. Based on rigorous peer reviews, the program committee carefully selected 263 revised papers from 810 submissions for presentation in three volumes. The papers have been organized in the following topical sections: quantitative image analysis I: segmentation and measurement; computer-aided diagnosis: machine learning; computer-aided diagnosis: automation; quantitative image analysis II: classification, detection, features, and morphology; advanced MRI: diffusion, fMRI, DCE; quantitative image analysis III: motion, deformation, development and degeneration; quantitative image analysis IV: microscopy, fluorescence and histological imagery; registration: method and advanced applications; reconstruction, image formation, advanced acquisition - computational imaging; modelling and simulation for diagnosis and interventional planning; computer-assisted and image-guided interventions.

The two volume set LNCS 4984 and LNCS 4985 constitutes the thoroughly refereed post-conference proceedings of the 14th International Conference on Neural Information Processing, ICONIP 2007, held in Kitakyushu, Japan, in November 2007, jointly with BRAINIT 2007, the 4th International Conference on Brain-Inspired Information Technology. The 228 revised full papers presented were carefully reviewed and selected from numerous ordinary paper submissions and 15 special organized sessions. The 116 papers of the first volume are organized in topical sections on computational neuroscience, learning and memory, neural network models, supervised/unsupervised/reinforcement learning, statistical learning algorithms, optimization algorithms, novel algorithms, as well as motor control and vision. The second volume contains 112 contributions related to statistical and pattern recognition algorithms, neuromorphic hardware and implementations, robotics, data mining and knowledge discovery, real world applications, cognitive and hybrid intelligent systems, bioinformatics, neuroinformatics, brain-conputer interfaces, and novel approaches.

On behalf of the organizing committee, we would like to welcome you to Da- nd stadt and DAGM 2010,the 32 Annual Symposium of the German Association for Pattern Recognition. The technical program covered all aspects of pattern recognition and, to name only a few areas, ranged from 3D reconstruction, to object recognition and medical applications. The result is re?ected in these proceedings, which contain the papers presented at DAGM 2010. Our call for papers resulted in 134 submissions from institutions in 21 countries. Each paper underwent a rigorous reviewing process and was assigned to at least three program committee m- bers for review. The reviewing phase was followed by a discussion phase among the respective program committee members in

order to suggest papers for - ceptance. The ?nal decision was taken during a program committee meeting held in Darmstadt based on all reviews, the discussion results and, if necessary, additional reviewing. Based on this rigorous process we selected a total of 57 papers, corresponding to an acceptance rate of below 45%. Out of all accepted papers, 24 were chosen for oral and 33 for poster presentation. All accepted - pers have been published in these proceedings and given the same number of pages. We would like to thank all members of the program committee as well as the external reviewers for their valuable and highly appreciated contribution to the community.

A Hierarchical Representation for Map Features

Deep Learning Essentials

27th DAGM Symposium, Vienna, Austria, August 31 - September 2, 2005, Proceedings

24th European Conference on Artificial Intelligence, 29 August-8 September 2020, Santiago de Compostela, Spain - Including 10th Conference on Prestigious Applications of Artificial Intelligence (PAIS 2020)

Hierarchical Feature Selection for Knowledge Discovery

Pattern Recognition

Advances in Concurrent Engineering

Graph-structured data is ubiquitous throughout the natural and social sciences, from telecommunication networks to quantum chemistry. Building relational inductive biases into deep learning architectures is crucial for creating systems that can learn, reason, and generalize from this kind of data. Recent years have seen a surge in research on graph representation learning, including techniques for deep graph embeddings, generalizations of convolutional neural networks to graph-structured data, and neural message-passing approaches inspired by belief propagation. These advances in graph representation learning have led to new state-of-the-art results in numerous domains, including chemical synthesis, 3D vision, recommender systems, question answering, and social network analysis. This book provides a synthesis and overview of graph representation learning. It begins with a discussion of the goals of graph representation learning as well as key methodological foundations in graph theory and network analysis. Following this, the book introduces and reviews methods for learning node embeddings, including random-walk-based methods and applications to knowledge graphs. It then provides a technical synthesis and introduction to the highly successful graph neural network (GNN) formalism, which has become a dominant and fast-growing paradigm for deep learning with graph data. The book concludes with a synthesis of recent advancements in deep generative models for graphs—a nascent but quickly growing subset of graph representation learning.

The volume LNAI 12872 constitutes the proceedings of the International Joint Conference on Rough Sets, IJCRS 2021, Bratislava, Slovak Republic, in September 2021. The conference was held as a hybrid event due to the COVID-19 pandemic. The 13 full paper and 7 short papers presented were carefully reviewed and selected from 26 submissions, along with 5 invited papers. The papers are grouped in the following topical sections: core rough set models and methods, related methods and hybridization, and areas of applications.

The three-volume set LNCS 11857, 11858, and 11859 constitutes the refereed proceedings of the Second Chinese Conference on Pattern Recognition and Computer Vision, PRCV 2019, held in Xi'an, China, in November 2019. The 165 revised full papers presented were carefully reviewed and selected from 412 submissions. The papers have been organized in the following topical sections: Part I: Object Detection, Tracking and Recognition, Part II: Image/Video Processing and Analysis, Part III: Data Analysis and Optimization.

Transfer learning deals with how systems can quickly adapt themselves to new situations, tasks and environments. It gives machine learning systems the ability to leverage auxiliary data and models to help solve target problems when there is only a small amount of data available. This makes such systems more reliable and robust, keeping the machine learning model faced with unforeseeable changes from deviating too much from expected performance. At an enterprise level, transfer learning allows knowledge to be reused so experience gained once can be repeatedly applied to the real world. For example, a pre-trained model that takes account of user privacy can be downloaded and adapted at the edge of a computer network. This self-contained, comprehensive reference text describes the standard algorithms and demonstrates how these are used in different transfer learning paradigms. It offers a solid grounding for newcomers as well as new insights for seasoned researchers and developers.

Learning Hierarchical Representations for Video Analysis Using Deep Learning

Scale-Space Theories in Computer Vision

Advanced Data Mining and Applications

ECAI 2020

Transfer Learning

Recent Trends in Image Processing and Pattern Recognition

Medical Image Computing and Computer-Assisted Intervention – MICCAI 2015

There is increasing interest in map features such as points, lines and regions both as a pictoral data base for resource management and as an aid to identifying objects in aerial images. Owing to the very large amount of data involved, and the need to perform operations on this data efficiently, the representation of such features is a crucial issue. We describe a hierarchical representation of map features that consists of binary trees with a special datum at each node. This datum is called a strip and the tree that contains such data is called a strip tree. Lower levels in the tree corresponds to finer resolution representations of the map feature. The strip tree structure is a direct consequence of using the method for digitizing lines given by Duda & Hart, 1973; Turner, 1974; Douglas & Peucker, 1973) and retaining all intermediate steps. This representation has several desirable properties. For features which are well-behaved, calculations such as point-membership and intersection can be resolved in 0(logn) where n is the number of feature points. The map features can be efficiently encoded and displayed at various resolutions.

Machine learning has proved a powerful tool for artificial intelligence and data mining problems. However, its success has usually relied on having a good feature representation of the data, and having a poor representation can severely limit the performance of learning algorithms. These feature representations are often hand-designed, require significant amounts of domain knowledge and human labor, and do not generalize well to new domains. To address these issues, I will present machine learning algorithms that can automatically learn good feature representations from unlabeled data in various domains, such as images, audio, text, and robotic sensors. Specifically, I will first describe how efficient sparse coding algorithms --- which represent each input example using a small number of basis vectors --- can be used to learn good low-level representations from unlabeled data. I also show that this gives feature representations that yield improved performance in many machine learning tasks. In addition, building on the deep learning framework, I will present two new algorithms, sparse deep belief networks and convolutional deep belief networks, for building more complex, hierarchical representations, in which more complex features are automatically learned as a composition of simpler ones. When applied to images, this method automatically learns features that correspond to objects and decompositions of objects into object-parts. These features often lead to performance competitive with or better than highly hand-engineered computer vision algorithms in object recognition and segmentation tasks. Further, the same algorithm can be used to learn feature representations from audio data. In particular, the learned features yield improved performance over state-of-the-art methods in several speech recognition tasks.

The censorship and surveillance of individuals, societies, and countries have been a long-debated ethical and moral issue. In consequence, it is vital to explore this controversial topic from all angles. Censorship, Surveillance, and Privacy: Concepts, Methodologies, Tools, and Applications is a vital reference source on the social, moral, religious, and political aspects of censorship and surveillance. It also explores the techniques of technologically supported censorship and surveillance. Highlighting a range of topics such as political censorship, propaganda, and information privacy, this multi-volume book is geared towards government officials, leaders, professionals, policymakers, media specialists, academicians, and researchers interested in the various facets of censorship and surveillance.

It has been stated in psychology that human brain arranges information in a way that improves efficiency in performing common tasks, for example, information about our spatial environment is conveniently structured for efficient route finding. On the other hand, in computational sciences, the use of hierarchical information is well known for reducing the complexity of solving problems. This book studies hierarchical representations of large-scale space and presents a new model, called Multi-AH-graph, that uses multiple hierarchies of abstraction. It allows an agent to represent structural information acquired from the environment (elements such as objects, free space, etc., relations existing between them, such as proximity, similarity, etc. and other types of information, such as colors, shapes, etc). The Multi-AH-graph model extends a single hierarchy representation to a mUltiple hierarchy arrangement, which adapts better to a wider range of tasks, agents, and environments. We also present a system called CLAUDIA, which is an implementation of the task-driven paradigm for automatic construction of multiple abstractions: a set of hierarchies of abstraction will be "good" for an agent if it can reduce the cost of planning and performing certain tasks of the agent in the agent's world. CLAUDIA constructs multiple hierarchies (Multi-AH-graphs) for a given triple , trying to optimize their "goodness".

Concepts, Methodologies, Tools, and Applications

Your hands-on guide to the fundamentals of deep learning and neural network modeling

32nd DAGM Symposium, Darmstadt, Germany, September 22-24, 2010, Proceedings

27th International Conference, DASFAA 2022, Virtual Event, April 11–14, 2022, Proceedings, Part II

Feature Engineering for Machine Learning and Data Analytics

This book constitutes the refereed proceedings of the 13th International Conference on Advanced Data Mining and Applications, ADMA 2017, held in Singapore in November 2017. The 20 full and 38 short papers presented in this volume were carefully reviewed and selected from 118 submissions. The papers were organized in topical sections named: database and distributed machine learning; recommender system; social network and social media; machine learning; classification and clustering methods; behavior modeling and user profiling; bioinformatics and medical data analysis; spatio-temporal data; natural language processing and text mining; data mining applications; applications; and demos.

This book is the first work that systematically describes the procedure of data mining and knowledge discovery on Bioinformatics databases by using the state-of-the-art hierarchical feature selection algorithms. The novelties of this book are three-fold. To begin with, this book discusses the hierarchical feature selection in depth, which is generally a novel research area in Data Mining/Machine Learning. Seven different state-of-the-art hierarchical feature selection algorithms are discussed and evaluated by working with four types of interpretable classification algorithms (i.e. three types of Bayesian network classification algorithms and the k-nearest neighbours classification algorithm). Moreover, this book discusses the application of those hierarchical feature selection algorithms on the well-known Gene Ontology database, where the entries (terms) are hierarchically structured. Gene Ontology database that unifies the representations of gene and gene products annotation provides the resource for mining valuable knowledge about certain biological research topics, such as the Biology of Ageing. Furthermore, this book discusses the mined biological patterns by the hierarchical feature selection algorithms relevant to the ageing-associated genes. Those patterns reveal the potential ageing-associated factors that inspire future research directions for the Biology of Ageing research.

This book covers recent developments in the field, from multi-layered mark-up and standards to theoretical formalisms to applications. It presents results from international research in text technology, computational linguistics, hypertext modeling and more.