Image Compression Neural Network Matlab Code Thesis

This book constitutes the refereed proceedings of the 5th IFIP TC 5 International Conference on Computer Science and Its Applications, CIIA 2015, held in Saida, Algeria, in May 2015. The 56 revised papers presented were carefully reviewed and selected from 225 submissions. The papers are organized in the following four research tracks: computational intelligence; security and network technology; information technology; and software engineering.

The use of neural networks is permeating every area of signal processing. They can provide powerful means for solving many problems, especially in nonlinear, real-time, adaptive, and blind signal processing. The Handbook of Neural Network Signal Processing brings together applications that were previously scattered among various publications to provide an up-to-date, detailed treatment of the subject from an engineering point of view. The authors cover basic principles, modeling, algorithms, architectures, implementation procedures, and well-designed simulation examples of audio, video, speech, communication, geophysical, sonar, radar, medical, and many other signals. The subject of neural networks and their application to signal processing is constantly improving. You need a handy reference that will inform you of current applications in this new area. The Handbook of Neural Network Signal Processing provides this much needed service for all engineers and scientists in the field.

This book constitutes the refereed proceedings of the Third International Workshop on Applied Reconfigurable Computing, ARC 2007, held in Mangaratiba, Brazil, in March 2007. The 27 full papers and 10 short papers presented together with a late-comer contribution from ARC 2006 are organized in topical sections on architectures, mapping techniques and tools, arithmetic, and applications.

This textbook, now in its second edition, provides a broad introduction to both continuous and discrete dynamical systems, the theory of which is motivated by examples from a wide range of disciplines. It emphasizes applications and simulation utilizing MATLAB®, Simulink®, the Image Processing Toolbox® and the Symbolic Math toolbox®, including MuPAD. Features new to the second edition include · sections on series solutions of ordinary differential equations, perturbation methods, normal forms, Gröbner bases, and chaos synchronization; · chapters on image processing and binary oscillator computing; · hundreds of new illustrations, examples, and exercises with solutions; and · over eighty up-to-date MATLAB program files and Simulink model files available online. These files were voted MATLAB Central Pick of the Week in July 2013. The hands-on approach of Dynamical Systems with Applications using MATLAB, Second Edition, has minimal prerequisites, only requiring familiarity with ordinary differential equations. It will appeal to advanced undergraduate and graduate students, applied mathematicians, engineers, and researchers in a broad range of disciplines such as population dynamics, biology, chemistry, computing, economics, nonlinear optics, neural networks, and physics. Praise for the first edition Summing up, it can be said that this text allows the reader to have an easy and quick start to the huge field of dynamical systems theory. MATLAB/SIMULINK facilitate this approach under the aspect of learning by doing. —OR News/Operations Research Spectrum The MATLAB programs are kept as simple as possible and the author's experience has shown that this method of teaching using MATLAB works well with computer laboratory classes of small sizes.... I recommend 'Dynamical Systems with Applications using MATLAB' as a good handbook for a diverse readership: graduates and professionals in mathematics, physics, science and engineering. —Mathematica

This book explores the use of a socio-inspired optimization algorithm (the Cohort Intelligence algorithm), along with Cognitive Computing and a Multi-Random Start Local Search optimization algorithm. One of the most important types of media used for steganography is the JPEG image. Considering four important aspects of steganography techniques – picture quality, high data-hiding capacity, secret text security and computational time – the book provides extensive information on four novel image-based steganography approaches that employ JPEG compression. Academics, scientists and engineers engaged in research, development and application of steganography techniques, optimization and data analytics will find the book's comprehensive coverage an invaluable resource.

This two-volume book presents outcomes of the 7th International Conference on Soft Computing for Problem Solving, SocProS 2017. This conference is a joint technical collaboration between the Soft Computing Research Society, Liverpool Hope University (UK), the Indian Institute of Technology Roorkee, the South Asian University New Delhi and the National Institute of Technology Silchar, and brings together researchers, engineers and practitioners to discuss thought-provoking developments and challenges in order to select potential future directions The book presents the latest advances and innovations in the interdisciplinary areas of soft computing, including original research papers in the areas including, but not limited to, algorithms (artificial immune systems, artificial neural networks, genetic algorithms, genetic programming, and particle swarm optimization) and applications (control systems, data mining and clustering, finance, weather forecasting, game theory, business and forecasting applications). It is a valuable resource for both young and experienced researchers dealing with complex and intricate real-world problems for which finding a solution by traditional methods is a difficult task.

This book and its companion volumes, LNCS vols. 5551, 5552 and 5553, constitute the proceedings of the 6th International Symposium on Neural Networks (ISNN 2009), held during May 26–29, 2009 in Wuhan, China. Over the past few years, ISNN has matured into a well-established premier international symposium on neural n- works and related fields, with a successful sequence of ISNN symposia held in Dalian (2004), Chongqing (2005), Chengdu (2006), Nanjing (2007), and Beijing (2008). Following the tradition of the ISNN series, ISNN 2009 provided a high-level inter- tional forum for scientists, engineers, and educators to present state-of-the-art research in neural networks and related fields, and also to discuss with international colleagues on the major opportunities and challenges for future neural network research. Over the past decades, the neural network community has witnessed tremendous - forts and developments in all aspects of neural network research, including theoretical foundations, architectures and network organizations,

modeling and simulation, - pirical study, as well as a wide range of applications across different domains. The recent developments of science and technology, including neuroscience, computer science, cognitive science, nano-technologies and engineering design, among others, have provided significant new understandings and technological solutions to move the neural network research toward the development of complex, large-scale, and n- worked brain-like intelligent systems. This long-term goal can only be achieved with the continuous efforts of the community to seriously investigate different issues of the neural networks and related fields.

Images are forming an increasingly large part of modern communications, bringing the need for efficient and effective compression. Many techniques developed for this purpose include transform coding, vector quantization and neural networks. In this thesis, a new neural network method is used to achieve image compression. This work extends the use of 2-layer neural networks to a combination of cascaded networks with one node in the hidden layer. A redistribution of the gray levels in the training phase is implemented in a random fashion to make the minimization of the mean square error applicable to a broad range of images. The computational complexity of this approach is analyzed in terms of overall number of weights and overall convergence. Image quality is measured objectively, using peak signal-to-noise ratio and subjectively, using perception. The effects of different image contents and compression ratios are assessed. Results show the performance superiority of cascaded neural networks compared to that of fixed-architecture training paradigms especially at high compression ratios. The proposed new method is implemented in MATLAB. The results obtained, such as compression ratio and computing time of the compressed images, are presented.

This book brings together some of the latest research in robot applications, control, modeling, sensors and algorithms. Consisting of three main sections, the first section of the book has a focus on robotic surgery, rehabilitation, self-assembly, while the second section offers an insight into the area of control with discussions on exoskeleton control and robot learning among others. The third section is on vision and ultrasonic sensors which is followed by a series of chapters which include a focus on the programming of intelligent service robots and systems adaptations.

This book constitutes the refereed proceedings of the 14th International Conference on Information Systems Security, ICISS 2018, held in Bangalore, India, in December 2018.The 23 revised full papers presented in this book together with 1 invited paper and 3 keynote abstracts were carefully reviewed and selected from 51 submissions. The papers are organized in the following topical sections: security for ubiquitous computing; modelling and anaylsis of attacks; smartphone security; cryptography and theory; enterprise and cloud security; machine learning and security; privacy; and client security and authentication.

Image and video signals require large transmission bandwidth and storage, leading to high costs. The data must be compressed without a loss or with a small loss of quality. Thus, efficient image and video compression algorithms play a significant role in the storage and transmission of data. Image and Video Compression: Fundamentals, Techniques, and Applications explains the major techniques for image and video compression and demonstrates their practical implementation using MATLAB® programs. Designed for students, researchers, and practicing engineers, the book presents both basic principles and real practical applications. In an accessible way, the book covers basic schemes for image and video compression, including lossless techniques and wavelet- and vector quantization-based image compression and digital video compression. The MATLAB programs enable readers to gain hands-on experience with the techniques. The authors provide quality metrics used to evaluate the performance of the compression algorithms. They also introduce the modern technique of compressed sensing, which retains the most important part of the signal while it is being sensed.

Offering a wide range of programming examples implemented in MATLAB®, Computational Intelligence Paradigms: Theory and Applications Using MATLAB® presents theoretical concepts and a general framework for computational intelligence (CI) approaches, including artificial neural networks, fuzzy systems, evolutionary computation, genetic algorithms and programming, and swarm intelligence. It covers numerous intelligent computing methodologies and algorithms used in CI research. The book first focuses on neural networks, including common artificial neural networks; neural networks based on data classification, data association, and data conceptualization; and real-world applications of neural networks. It then discusses fuzzy sets, fuzzy rules, applications of fuzzy systems, and different types of fused neuro-fuzzy systems, before providing MATLAB illustrations of ANFIS, classification and regression trees, fuzzy c-means clustering algorithms, fuzzy ART map, and Takagi–Sugeno inference systems. The authors also describe the history, advantages, and disadvantages of evolutionary computation and include solved MATLAB programs to illustrate the implementation of evolutionary computation in various problems. After exploring the operators and parameters of genetic algorithms, they cover the steps and MATLAB routines of genetic programming. The final chapter introduces swarm intelligence and its applications, particle swarm optimization, and ant colony optimization. Full of worked examples and end-of-chapter questions, this comprehensive book explains how to use MATLAB to implement CI techniques for the solution of biological problems. It will help readers with their work on evolution dynamics, self-organization, natural and artificial morphogenesis, emergent collective behaviors, swarm intelligence, evolutionary strategies, genetic programming, and the evolution of social behaviors.

The latest trends in Information Technology represent a new intellectual paradigm for scientific exploration and visualization of scientific phenomena. The present treatise covers almost all the emerging technologies in the field. Academicians, engineers, industralists, scientists and researchers engaged in teaching, research and development of Computer Science and Information Technology will find the book useful for their future academic and research work. The present treatise comprising 225 articles broadly covers the following topics exhaustively. 01. Advance Networking and Security/Wireless Networking/Cyber Laws 02. Advance Software Computing 03. Artificial Intelligence/Natural Language Processing/ Neural Networks 04. Bioinformatics/Biometrics 05. Data Mining/E-Commerce/E-Learning 06. Image

Processing, Content Based Image Retrieval, Medical and Bio-Medical Imaging, Wavelets 07. Information Processing/Audio and Text Processing/Cryptology, Steganography and Digital Watermarking 08. Pattern Recognition/Machine Vision/Image Motion, Video Processing 09. Signal Processing and Communication/Remote Sensing 10. Speech Processing & Recognition, Human Computer Interaction 11. Information and Communication Technology

CI Techniques & Algorithms for a Variety of Medical Imaging Situations Documents recent advances and stimulates further research A compilation of the latest trends in the field, Computational Intelligence in Medical Imaging: Techniques and Applications explores how intelligent computing can bring enormous benefit to existing technology in medical image processing as well as improve medical imaging research. The contributors also cover state-of-the-art research toward integrating medical image processing with artificial intelligence and machine learning approaches. The book presents numerous techniques, algorithms, and models. It describes neural networks, evolutionary optimization techniques, rough sets, support vector machines, tabu search, fuzzy logic, a Bayesian probabilistic framework, a statistical parts-based appearance model, a reinforcement learning-based multistage image segmentation algorithm, a machine learning approach, Monte Carlo simulations, and intelligent, deformable models. The contributors discuss how these techniques are used to classify wound images, extract the boundaries of skin lesions, analyze prostate cancer, handle the inherent uncertainties in mammographic images, and encapsulate the natural intersubject anatomical variance in medical images. They also examine prostate segmentation in transrectal ultrasound images, automatic segmentation and diagnosis of bone scintigraphy, 3-D medical image segmentation, and the reconstruction of SPECT and PET tomographic images.

th On behalf of the organizing committee of the 13 International Conference on Biomedical Engineering, I extend our w-mest welcome to you. This series of conference began in 1983 and is jointly organized by the YLL School of Medicine and Faculty of Engineering of the National University of Singapore and the Biomedical Engineering Society (Singapore). First of all, I want to thank Mr Lim Chuan Poh, Chairman A*STAR who kindly agreed to be our Guest of Honour to give th the Opening Address amidst his busy schedule. I am delighted to report that the 13 ICBME has more than 600 participants from 40 countries. We have received very high quality papers and inevitably we had to turndown some papers. We have invited very prominent speakers and each one is an authority in their field of expertise. I am grateful to each one of them for setting aside their valuable time to participate in this conference. For the first time, the Biomedical Engineering Society (USA) will be sponsoring two symposia, ie "Drug Delivery S- tems" and "Systems Biology and Computational Bioengineering". I am thankful to Prof Tom Skalak for his leadership in this initiative. I would also like to acknowledge the contribution of Prof Takami Yamaguchi for organizing the NUS-Tohoku's Global COE workshop within this conference. Thanks also to Prof Fritz Bodem for organizing the symposium, "Space Flight Bioengineering". This year's conference proceedings will be published by Springer as an IFMBE Proceedings Series.

The sixteen-volume set comprising the LNCS volumes 11205-11220 constitutes the refereed proceedings of the 15th European Conference on Computer Vision, ECCV 2018, held in Munich, Germany, in September 2018.The 776 revised papers presented were carefully reviewed and selected from 2439 submissions. The papers are organized in topical sections on learning for vision; computational photography; human analysis; human sensing; stereo and reconstruction; optimization; matching and recognition; video attention; and poster sessions.

Based on the 4th Seminar on Algebra and its Applications organized by the University of Mohaghegh Ardabili, this volume highlights recent developments and trends in algebra and its applications. Selected and peer reviewed, the contributions in this volume cover areas that have flourished in the last few decades, including homological algebra, combinatorial algebra, module theory and linear algebra over rings, multiplicative ideal theory, and integer-valued polynomials. Held biennially since 2010, SAA introduces Iranian faculty and graduate students to important ideas in the mainstream of algebra and opens channels of communication between Iranian mathematicians and algebraists from around the globe to facilitate collaborative research. Ideal for graduate students and researchers in the field, these proceedings present the best of the seminar's research achievements and new contributions to the field.

This book constitutes the refereed proceedings of the 8th Mexican International Conference on Artificial Intelligence, MICAI 2009, held in Guanajuato, Mexico, in November 2009. The 63 revised full papers presented together with one invited talk were carefully reviewed and selected from 215 submissions. The papers are organized in topical sections on logic and reasoning, ontologies, knowledge management and knowledge-based systems, uncertainty and probabilistic reasoning, natural language processing, data mining, machine learning, pattern recognition, computer vision and image processing, robotics, planning and scheduling, fuzzy logic, neural networks, intelligent tutoring systems, bioinformatics and medical applications, hybrid intelligent systems and evolutionary algorithms.

The 30-volume set, comprising the LNCS books 12346 until 12375, constitutes the refereed proceedings of the 16th European Conference on Computer Vision, ECCV 2020, which was planned to be held in Glasgow, UK, during August 23-28, 2020. The conference was held virtually due to the COVID-19 pandemic. The 1360 revised papers presented in these proceedings were carefully reviewed and selected from a total of 5025 submissions. The papers deal with topics such as computer vision; machine learning; deep neural networks; reinforcement learning; object recognition; image classification; image processing; object detection; semantic segmentation; human pose estimation; 3d reconstruction; stereo vision; computational photography; neural networks; image coding; image reconstruction; object recognition; motion estimation.

The book includes selected high-quality research papers presented at the Third International Congress on Information and Communication Technology held at Brunel University, London on February 27–28, 2018. It discusses emerging topics pertaining to information and communication technology (ICT) for managerial applications, e-governance, e-agriculture, e-education and computing technologies, the Internet of Things (IOT), and e-mining. Written by experts and researchers working on ICT, the book is suitable for new researchers involved in advanced studies.

Meant for students and practicing engineers, this book provides a clear, comprehensive and up-to-date introduction to Digital Image Processing in a pragmatic style. An illustrative approach, practical examples and MATLAB applications given in the book help in bringing the theory to life.

This book constitutes the refereed post-conference proceedings of the 4th International Conference on Intelligence Science, ICIS 2020, held in Durgapur, India, in February 2021 (originally November 2020). The 23 full papers and 4 short papers presented were carefully reviewed and selected from 42 submissions. One extended abstract is also included. They deal with key issues in brain cognition; uncertain theory;

machine learning; data intelligence; language cognition; vision cognition; perceptual intelligence; intelligent robot; and medical artificial intelligence.

This introduction to the fundamental concepts and methodologies of image processing is suitable for first-year postgraduate and senior undergraduate students in almost every engineering discipline, and in particular meets the requirement of the prescribed courses in the streams: Electronics and Communication, Computer Science and Engineering, Information Technology, and Computer Applications. The book, now in its second edition, continues to offer a balanced exposition of the basic principles and applications of image processing. It lays considerable emphasis on the algorithmic approach in order to teach students how to write good practical programs for problem solving. Major topics covered in the book include Image fundamentals, Different image transforms, Image enhancement in the spatial and frequency domains, Restoration, Image analysis, Image description, Image compression, Image reconstruction from projections, and Applications of image processing in the areas of biometrics, speaker recognition, satellite imaging, medical imaging, and many more. The style of presentation is comprehensive and application oriented, comprising examples, diagrams, image results, case studies of applications, and review questions—making it easy for students to understand key ideas, their practical relevance and applications. NEW TO THIS EDITION • Object representation, recognition and classification • MATLAB programs for image processing • OpenCV programs for image processing This comprehensive text/reference presents an in-depth review of the state of the art of automotive connectivity and cybersecurity with regard to trends, technologies, innovations, and applications. The text describes the challenges of the global automotive market, clearly showing where the multitude of innovative activities fit within the overall effort of cutting-edge automotive innovations, and provides an ideal framework for understanding the complexity of automotive connectivity and cybersecurity. Topics and features: discusses the automotive market, automotive research and development, and automotive electrical/electronic and software technology; examines connected cars and autonomous vehicles, and methodological approaches to cybersecurity to avoid cyber-attacks against vehicles; provides an overview on the automotive industry that introduces the trends driving the automotive industry towards smart mobility and autonomous driving; reviews automotive research and development, offering background on the complexity involved in developing new vehicle models; describes the technologies essential for the evolution of connected cars, such as cyber-physical systems and the Internet of Things; presents case studies on Car2Go and car sharing, car hailing and ridesharing, connected parking, and advanced driver assistance systems; includes review questions and exercises at the end of each chapter. The insights offered by this practical guide will be of great value to graduate students, academic researchers and professionals in industry seeking to learn about the advanced methodologies in automotive connectivity and cybersecurity.

This book constitutes the refereed proceedings of the First International Conference on Smart Trends in Information Technology and Computer Communications, SmartCom 2016, held in Jaipur, India, in August 2016. The 106 revised papers presented were carefully reviewed and selected from 469 submissions. The papers address issues on smart and secure systems; technologies for digital world; data centric approaches; applications for e-agriculture and e-health; products and IT innovations; research for knowledge computing.

MATLAB: Easy Way of Learning, covers exactly what students need to know in an introductory course. This comprehensive book helps reader in understanding all the aspects of MATLAB basics and applications in an easy way. The authors explain concepts by balanced treatment of theoretical and practical concepts with easy-to-understand programming codes and executions. The book is suitable for the postgraduate and undergraduate students of engineering and sciences streams.

This book highlights the ability of neural networks (NNs) to be excellent pattern matchers and their importance in information retrieval (IR), which is based on index term matching. The book defines a new NN-based method for learning image similarity and describes how to use fuzzy Gaussian neural networks to predict personality.It introduces the fuzzy Clifford Gaussian network, and two concurrent neural models: (1) concurrent fuzzy nonlinear perceptron modules, and (2) concurrent fuzzy Gaussian neural network modules.Furthermore, it explains the design of a new model of fuzzy nonlinear perceptron based on alpha level sets and describes a recurrent fuzzy neural network model with a learning algorithm based on the improved particle swarm optimization method.

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1 Information Technology, Engineering, and Management 2 Logistic and Supply Chain 3 Social Sciences 4 Forensics Science and Innovation Technology 5 Strategic Technology and Management 6 Sustainable Technology

This monograph focuses on the mathematical modeling of distributed parameter systems in which mass/energy transport or wave propagation phenomena occur and which are described by partial differential equations of hyperbolic type. The case of linear (or linearized) 2 x 2 hyperbolic systems of balance laws is considered, i.e., systems described by two coupled linear partial differential equations with two variables representing physical quantities, depending on both time and one-dimensional spatial variable. Based on practical examples of a double-pipe heat exchanger and a transportation pipeline, two typical configurations of boundary input signals are analyzed: collocated, wherein both signals affect the system at the same spatial point, and anti-collocated, in which the input signals are applied to the two different end points of the system. The results of this book emerge from the practical experience of the author gained during his studies conducted in the experimental installation of a heat exchange center as well as from his research experience in the field of mathematical pnd computer modeling of dynamic systems. The book presents valuable results concerning their state-space, transfer function and time-domain representations, which can be useful both for the open-loop analysis as well as for the closed-loop design. The book is primarily intended to help professionals as well as undergraduate and postgraduate students involved in modeling and automatic control of dynamic systems.

IJCNN is the flagship conference of the INNS, as well as the IEEE Neural Networks Society. It has arguably been the preeminent conference in the field, even as neural network conferences have proliferated and specialized. As the number of conferences has grown, its strongest competition has migrated away from an emphasis on neural networks. IJCNN has embraced the proliferation of spin-off and related fields (see the topic list, below), while maintaining a core emphasis befitting its name. It has also succeeded in enforcing an emphasis on quality.

Although there have been numerous books on wavelet applications to various scientific disciplines, this cutting-edge,

practical book is the first to concentrate on wavelet applications to remote sensing and subsurface sensing from an engineer's point of view. The book introduces you to wavelet transform uses in a wide range of sensing technologies, demonstrates the usefulness of combining the wavelet transform with other signal processing tools to solve complicated sensing technology problems, and features several time-saving algorithms and Matlab® codes that help you with your specific projects in the field.

This book constitutes the refereed proceedings of the International Conference on Intelligent Computing, ICIC 2006, held in Kunming, China, August 2006. The book collects 161 carefully chosen and revised full papers. Topical sections include neural networks, evolutionary computing and genetic algorithms, kernel methods, combinatorial and numerical optimization, multiobjective evolutionary algorithms, neural optimization and dynamic programming, as well as case-based reasoning and probabilistic reasoning.

This is the second volume in a trilogy on modern Signal Processing. The three books provide a concise exposition of signal processing topics, and a guide to support individual practical exploration based on MATLAB programs. This second book focuses on recent developments in response to the demands of new digital technologies. It is divided into two parts: the first part includes four chapters on the decomposition and recovery of signals, with special emphasis on images. In turn, the second part includes three chapters and addresses important data-based actions, such as adaptive filtering, experimental modeling, and classification.

The book is a collection of high-quality peer-reviewed research papers presented in the International Conference on Artificial Intelligence and Evolutionary Computations in Engineering Systems (ICAIECES 2017). The book discusses wide variety of industrial, engineering and scientific applications of the emerging techniques. Researchers from academia and industry have presented their original work and ideas, information, techniques and applications in the field of communication, computing and power technologies.

The Algorithms such as SVD, Eigen decomposition, Gaussian Mixture Model, HMM etc. are presently scattered in different fields. There remains a need to collect all such algorithms for quick reference. Also there is the need to view such algorithms in application point of view. This book attempts to satisfy the above requirement. The algorithms are made clear using MATLAB programs.