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The four volume set assembled following The 2005 International Conference on Computational Science and its Applications, ICCSA 2005, held in Suntec International Convention and Exhibition Centre, Singapore, from 9 May 2005 till 12 May 2005, represents the ?ne collection of 540 refereed papers selected from nearly 2,700 submissions. Computational Science has ?rmly established itself as a vital part of many scienti?c investigations, a?ecting researchers and practitioners in areas ranging from applications such as aerospace and automotive, to emerging technologies such as bioinformatics and nanotechnologies, to core disciplines such as ma- ematics, physics, and chemistry. Due to the shear size of many challenges in computational science, the use of supercomputing, parallel processing, and - phisticated algorithms is inevitable and becomes a part of fundamental t- oretical research as well as endeavors in emerging ?elds. Together, these far reaching scienti?c areas contribute to shape this Conference in the realms of state-of-the-art computational science research and applications, encompassing the facilitating theoretical foundations and the innovative applications of such results in other areas.

Computational Intelligence (CI) is a recently emerging area in fundamental and applied research, exploiting a number of advanced information processing technologies that mainly embody neural networks, fuzzy logic and evolutionary computation. With a major concern to exploiting the tolerance for imperfection, uncertainty, and partial truth to achieve tractability, robustness and low solution cost, it becomes evident that composing methods of CI should be working concurrently rather than separately. It is this conviction that research on the synergism of CI paradigms has experienced significant growth in the last decade with some areas nearing maturity while many others remaining unresolved. This book systematically summarizes the latest findings and sheds light on the respective fields that might lead to future breakthroughs. Contents: A Quest for Granular Computing and Logic Processing (W Pedrycz); Abstraction and Linguistic Analysis of Conventional Numerical Dynamic Systems (F-Y Wang); Slicing: A Distributed Learning Approach (S A Eschrich & L O Hall); Marginal Learning Algorithms in Statistical Machine Learning (Q Tao & J Wang); Constraint Handling in Genetic Algorithm for Optimization (G G Yen); Hybrid PSO-EA Algorithm for Training Feedforward and Recurrent Neural Networks for Challenging Problems (X Cai et al.); Modular Wavelet--Fuzzy Networks (Y Lin & F-Y Wang); Ant Colony Algorithms: The State-of-the-Art (J Zhang et al.); Motif Discoveries in DNA and Protein Sequences Using Self-Organizing Neural Networks (D Liu & X Xiong); Computational Complexities of Combinatorial Problems with Applications to Reverse Engineering of Biological Networks (P Berman et al.); Advances in Fingerprint Recognition Algorithms with Application (J Tian et al.); Adaptation and Predictive Control Observed in Neuromuscular Control Systems (J He); Robust Adaptive Approximation Based Backstepping via Localized Adaptive Bounding (Y Zhao & J A Farrell); Dynamically Connected Fuzzy Single Input Rule Modules and Application to Underactuated Systems (J Yi et al.). Readership: Researchers, graduate and senior level undergraduate students in electrical & electronic engineering, computer engineering, neural networks, fuzzy logic and artificial intelligence.

This book provides ample coverage of theoretical and experimental state-of-the-art work as well as new trends and directions in the biometrics field. It offers students and software engineers a thorough understanding of how some core low-level building blocks of a multi-biometric system are implemented. While this book covers a range of biometric traits, its main emphasis is placed on multi-sensory and multi--modal face biometrics algorithms and systems.

This book constitutes the revised selected papers of the 7th International Conference on Cloud Computing and Big Data, JCC&BD 2019, held in La Plata, Buenos Aires, Argentina, in June 2019. The 12 full papers presented were carefully reviewed and selected from a total of 31 submissions. They are dealing with such topics as cloud computing and HPC; Big Data and data intelligence; mobile computing.

"The Biometric Computing: Recognition & Registration" presents introduction of biometrics along with detailed analysis for identification and recognition methods. This book forms the required platform for understanding biometric computing and its implementation for securing target system. It also provides the comprehensive analysis on algorithms, architectures and interdisciplinary connection of biometric computing along with detailed case-studies for newborns and resolution spaces. The strength of this book is its unique approach starting with how biometric computing works to research paradigms and gradually moves towards its advancement. This book is divided into three parts that comprises basic fundamentals and definitions, algorithms and methodologies, and futuristic research and case studies. Features: A clear view to the fundamentals of Biometric Computing Identification and recognition approach for different human characteristics Different methodologies and algorithms for human identification using biometrics traits such as face, Iris, fingerprint, palm print, voiceprint etc. Interdisciplinary connection of biometric computing with the fields like deep neural network, artificial intelligence, Internet of Biometric Things, low resolution face recognition etc. This book is an edited volume by prominent invited researchers and practitioners around the globe in the field of biometrics, describes the fundamental and recent advancement in biometric recognition and registration. This book is a perfect research handbook for young practitioners who are intending to carry out their research in the field of Biometric Computing and will be used by industry professionals,

graduate and researcher students in the field of computer science and engineering.
The LNCS volume 10996 constitutes the proceedings of the 13th Chinese Conference on Biometric Recognition, held in Urumchi, China, in August 2018. The 79 regular papers presented in this book were carefully reviewed and selected from 112 submissions. The papers cover a wide range of topics such as Biometrics, Speech recognition, Activity recognition and understanding, Online handwriting recognition, System forensics, Multi-factor authentication, Graphical and visual passwords.
Written for researchers, advanced students and practitioners to use as a handbook, this volume captures the very latest state-of-the-art research contributions from leading international researchers in the field.
An authoritative survey of intelligent fingerprint-recognition concepts, technology, and systems is given. Editors and contributors are the leading researchers and applied R&D developers of this personal identification (biometric security) topic and technology. Biometrics and pattern recognition researchers and professionals will find the book an indispensable resource for current knowledge and technology in the field.

Computer vision algorithms for the analysis of video data are obtained from a camera aimed at the user of an interactive system. It is potentially useful to enhance the interface between users and machines. These image sequences provide information from which machines can identify and keep track of their users, recognize their facial expressions and gestures, and complement other forms of human-computer interfaces. Facial Analysis from Continuous Video with Applications to Human-Computer Interfaces presents a learning technique based on information-theoretic discrimination which is used to construct face and facial feature detectors. This book also describes a real-time system for face and facial feature detection and tracking in continuous video. Finally, this book presents a probabilistic framework for embedded face and facial expression recognition from image sequences. Facial Analysis from Continuous Video with Applications to Human--Computer Interfaces is designed for a professional audience composed of researchers and practitioners in industry. This book is also suitable as a secondary text for graduate-level students in computer science and engineering.
This book constitutes the refereed proceedings of the First International Conference on Advanced Machine Learning Technologies and Applications, AMLTA 2012, held in Cairo, Egypt, in December 2012. The 58 full papers presented were carefully reviewed and selected from 99 intial submissions. The papers are organized in topical sections on rough sets and applications, machine learning in pattern recognition and image processing, machine learning in multimedia computing, bioinformatics and cheminformatics, data classification and clustering, cloud computing and recommender systems.
This book describes a range of new biometric technologies, such as high-resolution fingerprint, finger-knuckle-print, multi-spectral backhand, 3D fingerprint, tongueprint, 3D ear, and multi-spectral iris technologies. Further, it introduces readers to efficient feature extraction, matching and fusion algorithms, in addition to developing potential systems of its own. These advanced biometric technologies and methods are divided as follows: 1. High-Resolution Fingerprint Recognition; 2. Finger-Knuckle-Print Verification; 3. Other Hand-Based Biometrics; and 4. New Head--Based Biometrics. Traditional biometric technologies, such as fingerprint, face, iris, and palmprint, have been extensively studied and addressed in many research books. However, all of these technologies have their own advantages and disadvantages, and there is no single type of biometric technology that can be used for all applications. Many new biometric technologies have been developed in recent years, especia lly in response to new applications. The contributions gathered here focus on how to develop a new biometric technology based on the requirements of essential applications, and how to design efficient algorithms that yield better performance.
The methods for human identity authentication based on biometrics - the physiological and behavioural characteristics of a person have been evolving continuously and seen significant improvement in performance and robustness over the last few years. However, most of the systems reported perform well in controlled operating scenarios, and their performance deteriorates significantly under real world operating conditions, and far from satisfactory in terms of robustness and accuracy, vulnerability to fraud and forgery, and use of acceptable and appropriate authentication protocols. To address some challenges, and the requirements of new and emerging applications, and for seamless diffusion of biometrics in society, there is a need for development of novel paradigms and protocols, and improved algorithms and authentication techniques. This book volume on "Advanced Biometric Technologies" is dedicated to the work being pursued by researchers around the world in this area, and includes some of the recent findings and their applications to address the challenges and emerging requirements for biometric based identity authentication systems. The book consists of 18 Chapters and is divided into four sections namely novel approaches, advanced algorithms, emerging applications and the multimodal fusion. The book was reviewed by editors Dr. Girija Chetty and Dr. Jucheng Yang We deeply appreciate the efforts of our guest editors: Dr. Norman Poh, Dr. Loris Nanni, Dr. Jianjiang Feng, Dr. Dongsun Park and Dr. Sook Yoon, as well as a number of anonymous reviewers.
Keywords. fingerprint verification, forensics, biometrics, partial fingerprint matching.
Biometrics such as fingerprint, face, gait, iris, voice and signature, recognizes one's identity using his/her physiological or behavioral characteristics. Among these biometric signs, fingerprint has been researched the longest period of time, and shows the most promising future in real--world applications. However, because of the complex distortions among the different impressions of the same finger, fingerprint recognition is still a challenging problem. Computational Algorithms for Fingerprint Recognition presents an entire range of novel computational algorithms for fingerprint recognition. These include feature extraction, indexing, matching, classification, and performance prediction/-validation methods, which have been compared with state-of-art algorithms and found to be effective and efficient on real--world data. All the algorithms have been evaluated on NIST-4 database from National Institute of Standards and Technology (NIST). Specific algorithms addressed include: -Learned template based minutiae extraction algorithm, -Triplets of minutiae based fingerprint indexing algorithm, -Genetic algorithm based fingerprint matching algorithm, -Genetic programming based feature learning algorithm for fingerprint classification, -Comparison of classification and indexing based approaches for identification, -Fundamental fingerprint matching performance prediction analysis and its validation. Computational Algorithms for Fingerprint Recognition is designed for a professional audience composed of researchers and practitioners in industry. This book is also suitable as a secondary text for graduate-level students in computer science and engineering.
Human Identification Based on Gait is the first book to address gait as a biometric. Biometrics is now in a unique position where it affects most people's lives. This is

especially true of "gait", which is one of the most recent biometrics. Recognizing people by the way they walk and run implies analyzing movement which, in turn, implies analyzing sequences of images, thus requiring memory and computational performance that became available only recently. Human Identification Based on Gait introduces developments from distinguished researchers within this relatively new area of biometrics. This book clearly establishes how human gait is biometric. Human Identification Based on Gait is structured to meet the needs of professionals in industry, as well as advanced-level students in computer science.

In recent years, biometrics has developed rapidly with its worldwide applications for daily life. New trends and novel developments have been proposed to acquire and process many different biometric traits. The ignored challenges in the past and potential problems need to be thought together and deeply integrated. The key objective of the book is to keep up with the new technologies on some recent theoretical development as well as new trends of applications in biometrics. The topics covered in this book reflect well both aspects of development. They include the new development in forensic speaker recognition, 3D and thermo face recognition, finger vein recognition, contact-less biometric system, hand geometry recognition, biometric performance evaluation, multi-biometric template protection, and novel subfields in the new challenge fields. The book consists of 13 chapters. It is divided into four sections, namely, theory and method, performance evaluation, security and template protection, and other applications. The book was reviewed by editors Dr. Jucheng Yang and Dr. Shanjuan Xie. We deeply appreciate the efforts of our guest editors: Dr. Norman Poh, Dr. Loris Nanni, Dr. Dongsun Park, Dr. Sook Yoon and Ms. Congcong Xiong, as well as a number of anonymous reviewers.

"Pattern Recognition, Machine Intelligence and Biometrics" covers the most recent developments in Pattern Recognition and its applications, using artificial intelligence technologies within an increasingly critical field. It covers topics such as: image analysis and fingerprint recognition; facial expressions and emotions; handwriting and signatures; iris recognition; hand-palm gestures; and multimodal based research. The applications span many fields, from engineering, scientific studies and experiments, to biomedical and diagnostic applications, to personal identification and homeland security. In addition, computer modeling and simulations of human behaviors are addressed in this collection of 31 chapters by top-ranked professionals from all over the world in the field of PR/AI/Biometrics. The book is intended for researchers and graduate students in Computer and Information Science, and in Communication and Control Engineering. Dr. Patrick S. P. Wang is a Professor Emeritus at the College of Computer and Information Science, Northeastern University, USA, Zijiang Chair of ECNU, Shanghai, and NSC Visiting Chair Professor of NTUST, Taipei.

This book constitutes the proceedings of the Third International Conference on Analysis of Images, Social Networks and Texts, AIST 2014, held in Yekaterinburg, Russia, in April 2014. The 11 full and 10 short papers were carefully reviewed and selected from 74 submissions. They are presented together with 3 short industrial papers, 4 invited papers and tutorials. The papers deal with topics such as analysis of images and videos; natural language processing and computational linguistics; social network analysis; machine learning and data mining; recommender systems and collaborative technologies; semantic web, ontologies and their applications; analysis of socio-economic data.

This book constitutes the refereed proceedings of the International Conference on Biometrics, ICB 2006, held in Hong Kong, China in January 2006. The book includes 104 revised full papers covering such areas of biometrics as the face, fingerprint, iris, speech and signature, biometric fusion and performance evaluation, gait, keystrokes, and more. In addition the results of the Face Authentication Competition (FAC 2006) are also announced in this volume.

This book features high-quality papers presented at the International Conference on Computational Intelligence and Informatics (ICCII 2018), which was held on 28–29 December 2018 at the Department of Computer Science and Engineering, JNTUH College of Engineering, Hyderabad, India. The papers focus on topics such as data mining, wireless sensor networks, parallel computing, image processing, network security, MANETS, natural language processing and Internet of things.

This comprehensive handbook addresses the sophisticated forensic threats and challenges that have arisen in the modern digital age, and reviews the new computing solutions that have been proposed to tackle them. These include identity-related scenarios which cannot be solved with traditional approaches, such as attacks on security systems and the identification of abnormal/dangerous behaviors from remote cameras. Features: provides an in-depth analysis of the state of the art, together with a broad review of the available technologies and their potential applications; discusses potential future developments in the adoption of advanced technologies for the automated or semi-automated analysis of forensic traces; presents a particular focus on the acquisition and processing of data from real-world forensic cases; offers an holistic perspective, integrating work from different research institutions and combining viewpoints from both biometric technologies and forensic science.

Offering the first comprehensive analysis of touchless fingerprint-recognition technologies, Touchless Fingerprint Biometrics gives an overview of the state of the art and describes relevant industrial applications. It also presents new techniques to efficiently and effectively implement advanced solutions based on touchless fingerprinting.The most

This book covers new developments and advances in the field of Computational Strategies for next-generation computing. The contributing authors share diverse perspectives on and extensive discussions of issues concerning the theory, applications, and future prospects. Addressing computing methodologies, hardware information systems and networks, this interdisciplinary book will appeal to all scholars with an interest in computing methodologies, hardware information systems and networks.

This Springerbrief presents an overview of problems and technologies behind segmentation and separation of overlapped latent fingerprints, which are two fundamental steps in the context of fingerprint matching systems. It addresses five main aspects: (1) the need for overlapped latent fingerprint segmentation and separation in the context of fingerprint verification systems; (2) the different datasets available for research on overlapped latent fingerprints; (3) selected algorithms and techniques for segmentation of overlapped latent fingerprints; (4) selected algorithms and techniques for separation of overlapped latent fingerprints; and (5) the use of deep learning techniques for segmentation and separation of overlapped latent fingerprints. By offering a structured overview of the most important approaches currently available, putting them in perspective, and suggesting numerous resources for further exploration, this book gives its readers a clear path for learning new topics and engaging in related research. Written from a technical perspective, and yet using language and terminology accessible to non-experts, it describes the technologies, introduces relevant datasets, highlights the most important re-

search results in each area, and outlines the most challenging open research questions. This Springerbrief targets researchers, professionals and advanced-level students studying and working in computer science, who are interested in the field of fingerprint matching and biometrics. Readers who want to deepen their understanding of specific topics will find more than one hundred references to additional sources of related information.

There is a changed emphasis in many health services, with conventional pressures such as budget and workforce constraints, combined with the indirect forces of social change and strategic direction, bringing about the need for more flexible approaches for the longer term. By enabling different care models and delivery channels, telehealth offers demonstrably effective and sustainable solutions for issues such as access to and quality of care. This book presents 18 papers delivered at the 5th Global Telehealth Conference, held in Auckland, New Zealand, in November 2016. The theme chosen for Global Telehealth 2016 is 'The Promise of New Technologies in an Age of New Health Challenges', and the papers included here cover a wide variety of topics, from theoretical and abstract contributions through to discussions of practical projects and highly specific applied contributions. The book also includes two invited papers which detail recent contributions to two global issues in which telehealth plays a major role: universal health coverage and personal health monitoring. With papers ranging in scope from computer assisted screening technology for diabetic retinopathy to behavior change through computer games, this book will be of interest to all those involved in the design and provision of healthcare services.

Although biometric systems present powerful alternatives to traditional authentication schemes, there are still many concerns about their security. Advances in Biometrics for Secure Human Authentication and Recognition showcases some of the latest technologies and algorithms being used for human authentication and recognition. Examining the full range of biometrics solutions, including unimodal and multimodal biometrics, the book covers conventional techniques as well as novel systems that have been developed over the past few years. It presents new biometric algorithms with novel feature extraction techniques, new computer vision approaches, soft computing approaches, and machine learning techniques under a unified framework used in biometrics systems. Filled with comprehensive graphical and modular illustrations, the text covers applications of affective computing in biometrics, matching sketch to photograph, cryptography approaches in biometrics, biometrics alteration, heterogeneous biometrics, and age invariant biometrics. It also presents biometrics algorithms with novel feature extraction techniques, computer vision approaches, soft computing approaches, and machine learning techniques under a unified framework used in biometrics systems. Containing the work of some of the world's most respected biometrics researchers, the book includes model question papers, mathematical notations, and exercises to reinforce understanding. Providing an up-to-date review of intelligence techniques and theories used in biometric technologies for secure human authentication and identification, this is an essential reference for researchers, scholars, graduate students, engineers, practitioners, and developers in the field of biometrics and its related fields.

Automatic Fingerprint authentication for personal identification and verification has received considerable attention over the past decades among various biometric techniques because of the distinctiveness and persistence properties of fingerprints. Now fingerprints are set to explode in popularity as they are being used to secure smart phones and to authorize payments in online stores. The main objective of this paper is to review the extensive research work that has been done over the past decade and discuss the various approaches proposed for fingerprint matching.

Biometric Systems provides practitioners with an overview of the principles and methods needed to build reliable biometric systems. It covers three main topics: key biometric technologies, design and management issues, and the performance evaluation of biometric systems for personal verification/identification. The four most widely used technologies are focused on - speech, fingerprint, iris and face recognition. Key features include: in-depth coverage of the technical and practical obstacles which are often neglected by application developers and system integrators and which result in shortfalls between expected and actual performance; and protocols and benchmarks which will allow developers to compare performance and track system improvements.

This book constitutes the proceedings of the Fourth International Conference on Analysis of Images, Social Networks and Texts, AIST 2015, held in Yekaterinburg, Russia, in April 2015. The 24 full and 8 short papers were carefully reviewed and selected from 140 submissions. The papers are organized in topical sections on analysis of images and videos; pattern recognition and machine learning; social network analysis; text mining and natural language processing.

This two-volume set CCIS 166 and CCIS 167 constitutes the refereed proceedings of the International Conference on Digital Information and Communication Technology and its Applications, DICTAP 2011, held in Dijon, France, in June 2010. The 128 revised full papers presented in both volumes were carefully reviewed and selected from 330 submissions. The papers are organized in topical sections on Web applications; image processing; visual interfaces and user experience; network security; ad hoc network; cloud computing; Data Compression; Software Engineering; Networking and Mobiles; Distributed and Parallel processing; social networks; ontology; algorithms; multimedia; e-learning; interactive environments and emergent technologies for e-learning; signal processing; information and data management.

A major new professional reference work on fingerprint security systems and technology from leading international researchers in the field. Handbook provides authoritative and comprehensive coverage of all major topics, concepts, and methods for fingerprint security systems. This unique reference work is an absolutely essential resource for all biometric security professionals, researchers, and systems administrators.

This book contains a selection of the best papers given at an international conference on advanced computer systems. The Advanced Computer Systems Conference was held in October 2006, in Miedzyzdroje, Poland. The book is organized into four topical areas: Artificial Intelligence; Computer Security and Safety; Image Analysis, Graphics and Biometrics; and Computer Simulation and Data Analysis.

This book provides an overview of computer techniques and tools — especially from artificial intelligence (AI) — for handling legal evidence, police intelligence, crime analysis or detection, and forensic testing, with a sustained discussion of methods for the modelling of reasoning and forming an opinion about the evidence, methods for the modelling of argumentation, and computational approaches to dealing with legal, or any, narratives. By the 2000s, the modelling of reasoning on legal evidence has emerged as a significant area within the well-established field of AI & Law. An overview such as this one has never been attempted before. It offers a panoramic view of topics, techniques and tools. It is more than a survey, as topic after topic,

the reader can get a closer view of approaches and techniques. One aim is to introduce practitioners of AI to the modelling legal evidence. Another aim is to introduce legal professionals, as well as the more technically oriented among law enforcement professionals, or researchers in police science, to information technology resources from which their own respective field stands to benefit. Computer scientists must not blunder into design choices resulting in tools objectionable for legal professionals, so it is important to be aware of ongoing controversies. A survey is provided of argumentation tools or methods for reasoning about the evidence. Another class of tools considered here is intended to assist in organisational aspects of managing of the evidence. Moreover, tools appropriate for crime detection, intelligence, and investigation include tools based on link analysis and data mining. Concepts and techniques are introduced, along with case studies. So are areas in the forensic sciences. Special chapters are devoted to VIRTOPSY (a procedure for legal medicine) and FLINTS (a tool for the police). This is both an introductory book (possibly a textbook), and a reference for specialists from various quarters.

The two volume set LNCS 4431 and LNCS 4432 constitutes the refereed proceedings of the 8th International Conference on Adaptive and Natural Computing Algorithms, ICANNGA 2007, held in Warsaw, Poland, in April 2007. The 178 revised full papers presented were carefully reviewed and selected from a total of 474 submissions.