Stan Z. Li · Anil K. Jain · Jiankang Deng *Editors*

Handbook of Face Recognition

Third Edition



Sebastian Brünink

Handbook of Face Recognition Stan Z. Li,Anil K. Jain,Jiankang Deng,2023-12-29 The history of computer aided face recognition dates to the 1960s yet the problem of automatic face recognition a task that humans perform routinely and effortlessly in our daily lives still poses great challenges especially in unconstrained conditions This highly anticipated new edition provides a comprehensive account of face recognition research and technology spanning the full range of topics needed for designing operational recognition systems After a thorough introduction each subsequent chapter focuses on a specific topic reviewing background information up to date techniques and recent results as well as offering challenges and future directions Topics and features Fully updated revised and expanded covering the entire spectrum of concepts methods and algorithms for automated detection and recognition systems Provides comprehensive coverage of face detection alignment feature extraction and recognition technologies and issues in evaluation systems security and applications Contains numerous step by step algorithms Describes a broad range of applications from person verification surveillance and security to entertainment Presents contributions from an international selection of preeminent experts Integrates numerous supporting graphs tables charts and performance data This practical and authoritative reference is an essential resource for researchers professionals and students involved in image processing computer vision biometrics security Internet mobile devices human computer interface E services computer graphics and animation and the computer game industry

Handbook of Face Recognition Stan Z. Li, Anil K. Jain, 2005-03-15 This authoritative handbook is the first to provide complete coverage of face recognition including major established approaches algorithms systems databases evaluation methods and applications After a thorough introductory chapter from the editors 15 chapters address the sub areas and major components necessary for designing operational face recognition systems Each chapter focuses on a specific topic reviewing background information reviewing up to date techniques presenting results and offering challenges and future directions This accessible practical reference is an essential resource for scientists and engineers practitioners government officials and students planning to work in image processing computer vision biometrics and security Internet communications computer graphics animation and the computer game industry BOOK JACKET **Handbook of Face Recognition** Stan Z. Li, Anil K. Jain, 2011-08-22 This highly anticipated new edition provides a comprehensive account of face recognition research and technology spanning the full range of topics needed for designing operational face recognition systems After a thorough introductory chapter each of the following chapters focus on a specific topic reviewing background information up to date techniques and recent results as well as offering challenges and future directions Features fully updated revised and expanded covering the entire spectrum of concepts methods and algorithms for automated face detection and recognition systems provides comprehensive coverage of face detection tracking alignment feature extraction and recognition technologies and issues in evaluation systems security and applications contains numerous step by step algorithms describes

a broad range of applications presents contributions from an international selection of experts integrates numerous supporting graphs tables charts and performance data **The Cambridge Handbook of Facial Recognition in the Modern State** Rita Matulionyte, Monika Zalnieriute, 2024-03-27 In situations ranging from border control to policing and welfare governments are using automated facial recognition technology FRT to collect taxes prevent crime police cities and control immigration FRT involves the processing of a person s facial image usually for identification categorisation or counting This ambitious handbook brings together a diverse group of legal computer communications and social and political science scholars to shed light on how FRT has been developed used by public authorities and regulated in different jurisdictions across five continents Informed by their experiences working on FRT across the globe chapter authors analyse the increasing deployment of FRT in public and private life The collection argues for the passage of new laws rules frameworks and approaches to prevent harms of FRT in the modern state and advances the debate on scrutiny of power and accountability of public authorities which use FRT This book is also available as Open Access on Cambridge Core

Reliable Face Recognition Methods Harry Wechsler, 2009-04-05 One of the challenges for computational intelligence and biometrics is to understand how people process and recognize faces and to develop automated and reliable face recognition systems Biometrics has become the major component in the complex decision making process associated with security applications. The many challenges addressed for face detection and authentication include cluttered environments occlusion and disguise temporal changes robust training and open set testing Reliable Face Recognition Methods seeks to comprehensively address the face recognition problem while gaining new insights from complementary fields of endeavor such as neurosciences statistics signal and image processing computer vision machine learning and data mining This book examines the evolution of research surrounding the field to date explores new directions and offers specific guidance on the most promising venues for future research and development Endorsements by Ruud Bolle IBM John Daugman Cambridge University UK David Zhang Hong Kong Polytechnic University China Stan Li Chinese Academy of Sciences China Tom Huang University of Illinois USA The Essential Guide to Image Processing Alan C. Bovik, 2009-07-08 A complete introduction to the basic and intermediate concepts of image processing from the leading people in the field Up to date content including statistical modeling of natural anistropic diffusion image quality and the latest developments in JPEG 2000 This comprehensive and state of the art approach to image processing gives engineers and students a thorough introduction and includes full coverage of key applications image watermarking fingerprint recognition face recognition and iris recognition and medical imaging This book combines basic image processing techniques with some of the most advanced procedures Introductory chapters dedicated to general principles are presented alongside detailed application orientated ones As a result it is suitably adapted for different classes of readers ranging from Master to PhD students and beyond Prof Jean Philippe Thiran EPFL Lausanne Switzerland Al Bovik's compendium proceeds systematically from fundamentals to today s

research frontiers Professor Bovik himself a highly respected leader in the field has invited an all star team of contributors Students researchers and practitioners of image processing alike should benefit from the Essential Guide Prof Bernd Girod Stanford University USA This book is informative easy to read with plenty of examples and allows great flexibility in tailoring a course on image processing or analysis Prof Pamela Cosman University of California San Diego USA A complete and modern introduction to the basic and intermediate concepts of image processing edited and written by the leading people in the field An essential reference for all types of engineers working on image processing applications Up to date content including statistical modelling of natural anisotropic diffusion image quality and the latest developments in JPEG 2000

Handbook of Digital Face Manipulation and Detection Christian Rathgeb, Ruben Tolosana, Ruben Vera-Rodriguez, Christoph Busch, 2022-01-31 This open access book provides the first comprehensive collection of studies dealing with the hot topic of digital face manipulation such as DeepFakes Face Morphing or Reenactment It combines the research fields of biometrics and media forensics including contributions from academia and industry Appealing to a broad readership introductory chapters provide a comprehensive overview of the topic which address readers wishing to gain a brief overview of the state of the art Subsequent chapters which delve deeper into various research challenges are oriented towards advanced readers Moreover the book provides a good starting point for young researchers as well as a reference guide pointing at further literature Hence the primary readership is academic institutions and industry currently involved in digital face manipulation and detection The book could easily be used as a recommended text for courses in image processing machine learning media forensics biometrics and the general security area Handbook of Research on Face *Processing* A.W. Young, H.D. Ellis, 2013-10-22 The high degree of scientific interest in face processing is readily understandable since people's faces provide such a wealth of social information Moreover investigations have produced evidence of highly precocious face processing abilities in infants and of neural mechanisms in adults that seem to be differentially involved in face perception Such findings demonstrate that as one might expect the psychological importance of the face has clear biological underpinnings There are also urgent practical reasons for wanting to understand face processing The most extensively investigated of these involve forensic issues Other applications include the development of automated recognition systems for security and other purposes and understanding and rehabilitating disorders and impairments linked to brain injuries and psychiatric conditions Current studies of face processing are grouped in the volume into eleven topic areas For each area the editors approached an acknowledged authority and commissioned a review chapter summarising the findings that have been made These chapters were then circulated to other experts who were asked to write brief commentaries that developed theoretical or empirical points of importance to each area In this way a balanced coverage of each topic is achieved The book begins with a section examining the evidence suggesting that there may be something special about face processing This is followed by consideration of the face as a visual pattern Then there are four

sections dealing with major uses of facial information followed by sections discussing the development of face processing abilities and the neural mechanisms involved The last three sections of the book deal with topics for which there are important practical applications for the studies reported Guide to e-Science Xiaovu Yang, Lizhe Wang, Wei Jie, 2011-05-26 This guidebook on e science presents real world examples of practices and applications demonstrating how a range of computational technologies and tools can be employed to build essential infrastructures supporting next generation scientific research Each chapter provides introductory material on core concepts and principles as well as descriptions and discussions of relevant e science methodologies architectures tools systems services and frameworks Features includes contributions from an international selection of preeminent e science experts and practitioners discusses use of mainstream grid computing and peer to peer grid technology for open research and resource sharing in scientific research presents varied methods for data management in data intensive research investigates issues of e infrastructure interoperability security trust and privacy for collaborative research examines workflow technology for the automation of scientific processes describes applications of e science Oxford Handbook of Face Perception Andy Calder, Gillian Rhodes, Mark Johnson, Jim Haxby, 2011-07-28 The human face is unique among social stimuli in conveying such a variety of different characteristics A person's identity sex race age emotional state focus of attention facial speech patterns and attractiveness are all detected and interpreted with relative ease from the face Humans also display a surprising degree of consistency in the extent to which personality traits such as trustworthiness and likeability are attributed to faces In the past thirty years face perception has become an area of major interest within psychology with a rapidly expanding research base Yet until now there has been no comprehensive reference work bringing together this ever growing body of research The Oxford Handbook of Face Perception is the most comprehensive and commanding review of the field ever published It looks at the functional and neural mechanisms underlying the perception representation and interpretation of facial characteristics such as identity expression eye gaze attractiveness personality and race It examines the development of these processes their neural correlates in both human and non human primates congenital and acquired disorders resulting from their breakdown and the theoretical and computational frameworks for their underlying mechanisms With chapters by an international team of leading authorities from the brain sciences the book is a landmark publication on face perception For anyone looking for the definitive text on this burgeoning field this is the essential book Encyclopedia of Biometrics Stan Z. Li,2009-08-27 With an A Z format this encyclopedia provides easy access to relevant information on all aspects of biometrics It features approximately 250 overview entries and 800 definitional entries Each entry includes a definition key words list of synonyms list of related entries illustration s applications and a bibliography Most entries include useful literature references providing the reader with a portal to more detailed information
Proceedings of the 2013 Joint Workshop of Fraunhofer IOSB and Institute for Anthropomatics, Vision and Fusion Laboratory Beyerer, Juergen, Pak, Alexey, 2014-07-23 This book is

a collection of 13 review technical reports summarizing the presentations at the 2013 Joint Workshop of Fraunhofer IOSB and the Vision and Fusion Laboratory at KIT Karlsruhe made by the students of the both institutions The topics include image processing visual inspection pattern recognition and classification planning and decision making human machine interaction world modeling and optical signal processing **Guide to Biometric Reference Systems and Performance Evaluation** Dijana Petrovska-Delacrétaz, Gérard Chollet, Bernadette Dorizzi, 2009-04-05 Biometrics has moved from using fingerprints to using many methods of assessing human physical and behavioral traits This guide introduces a new performance evaluation framework designed to offer full coverage of performance evaluation of biometric systems HCI for Cybersecurity, Privacy and Trust Abbas Moallem, 2020-07-10 This book constitutes the proceedings of the Second International Conference on HCI for Cybersecurity Privacy and Trust HCI CPT 2020 held as part of the 22nd International Conference HCI International 2020 which took place in Copenhagen Denmark in July 2020 The total of 1439 papers and 238 posters included in the 37 HCII 2020 proceedings volumes was carefully reviewed and selected from 6326 submissions HCI CPT 2020 includes a total of 45 regular papers they were organized in topical sections named human factors in cybersecurity privacy and trust usable security approaches As a result of the Danish Government's announcement dated April 21 2020 to ban all large events above 500 participants until September 1 2020 the HCII 2020 conference was held virtually **Medical Data Privacy Handbook** Aris Gkoulalas-Divanis, Grigorios Loukides, 2015-11-26 This handbook covers Electronic Medical Record EMR systems which enable the storage management and sharing of massive amounts of demographic diagnosis medication and genomic information It presents privacy preserving methods for medical data ranging from laboratory test results to doctors comments The reuse of EMR data can greatly benefit medical science and practice but must be performed in a privacy preserving way according to data sharing policies and regulations Written by world renowned leaders in this field each chapter offers a survey of a research direction or a solution to problems in established and emerging research areas The authors explore scenarios and techniques for facilitating the anonymization of different types of medical data as well as various data mining tasks Other chapters present methods for emerging data privacy applications and medical text de identification including detailed surveys of deployed systems A part of the book is devoted to legislative and policy issues reporting on the US and EU privacy legislation and the cost of privacy breaches in the healthcare domain This reference is intended for professionals researchers and advanced level students interested in safeguarding medical data Handbook of Neurosociology David D. Franks, Jonathan H. Turner, 2012-07-09 Until recently a handbook on neurosociology would have been viewed with skepticism by sociologists who have long been protective of their disciplinary domain against perceived encroachment by biology But a number of developments in the last decade or so have made sociologists more receptive to biological factors in sociology and social psychology Much of this has been encouraged by the coeditors of this volume David Franks and Jonathan Turner This new interest has been increased by the explosion of research in neuroscience on brain

functioning and brain environment interaction via new MRI technologies with implications for social and psychological functioning This handbook emphasizes the integration of perspectives within sociology as well as between fields in social neuroscience For example Franks represents a social constructionist position following from G H Mead s voluntaristic theory of the act while Turner is more social structural and positivistic Furthermore thishandbook not only contains contributions from sociologists but leading figures from the psychological perspective of social neuroscience Eyewitness Psychology: Volume II R.C.L. Lindsay, David F. Ross, J. Don Read, Michael P. Toglia, 2007-02-13 The Handbook of Eyewitness Psychology presents a survey of research and legal opinions from international experts on the rapidly expanding scientific literature addressing the accuracy and limitations of eyewitnesses as a source of evidence for the courts For the first time extensive reviews of factors influencing witnesses of all ages chil Handbook of Remote Biometrics Massimo Tistarelli, Stan Z. Li, Rama Chellappa, 2009-06-02 The development of technologies for the identication of individuals has driven the interest and curiosity of many people Spearheaded and inspired by the Bertillon coding system for the classi cation of humans based on physical measurements scientists and engineers have been trying to invent new devices and classi cation systems to capture the human identity from its body measurements One of the main limitations of the precursors of today s biometrics which is still present in the vast majority of the existing biometric systems has been the need to keep the device in close contact with the subject to capture the biometric measurements This clearly limits the applicability and convenience of biometric systems This book presents an important step in addressing this limitation by describing a number of methodologies to capture meaningful biometric information from a distance Most materials covered in this book have been presented at the International Summer School on Biometrics which is held every year in Alghero Italy and which has become a agship activity of the IAPR Technical Committee on Biometrics IAPR TC4 The last four chapters of the book are derived from some of the best p sentations by the participating students of the school The educational value of this book is also highlighted by the number of proposed exercises and questions which will help the reader to better understand the proposed topics Handbook of Biometrics for Forensic Science Massimo Tistarelli, Christophe Champod, 2017-02-01 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

Human-Robot Interaction Gholamreza Anbarjafari, Sergio Escalera, 2018-07-04 This book takes the vocal and visual modalities and human robot interaction applications into account by considering three main aspects namely social and affective robotics robot navigation and risk event recognition This book can be a very good starting point for the scientists who are about to start their research work in the field of human robot interaction

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