Automatic Visual Inspection Ieee Computer Society

Yeah, reviewing a book **automatic visual inspection ieee computer society** could ensue your near associates listings. This is just one of the solutions for you to be successful. As understood, triumph does not suggest that you have astonishing points.

Comprehending as without difficulty as deal even more than further will offer each success. adjacent to, the pronouncement as skillfully as sharpness of this automatic visual inspection ieee computer society can be taken as competently as picked to act.

Fault Diagnosis and Prognosis Techniques for Complex Engineering Systems - Hamid Reza Karimi 2021-06-05
Fault Diagnosis and Prognosis Techniques for Complex Engineering Systems gives a systematic description of the many facets of envisaging, designing, implementing, and experimentally exploring emerging trends in fault diagnosis and failure prognosis in mechanical, electrical, hydraulic and biomedical systems. The book is devoted to the development of mathematical methodologies for fault diagnosis and isolation, fault tolerant control, and failure prognosis problems of engineering systems. Sections present new techniques in reliability modeling, reliability analysis, reliability design, fault and failure detection, signal processing, and fault tolerant control of engineering systems. Sections focus on the development of mathematical methodologies for diagnosis and prognosis of faults or failures, providing a unified platform for understanding and applicability of advanced diagnosis and prognosis methodologies for improving reliability purposes in both theory and practice, such as vehicles, manufacturing systems, circuits, flights, biomedical systems. This book will be a valuable resource for different groups of readers – mechanical engineers working on vehicle systems, electrical engineers working on rotary machinery systems, control engineers working on fault detection systems, mathematicians and physician working on complex dynamics, and many more. Presents recent advances of theory, technological aspects, and applications of advanced diagnosis and prognosis methodologies in engineering applications Provides a series of the latest results, including fault detection, isolation, fault tolerant control, failure prognosis of components, and more Gives numerical and simulation results in each chapter to reflect engineering practices

1985 IEEE Computer Society Workshop on Computer Architecture for Pattern Analysis and Image Database Management, Miami Beach, Florida, November 18-20, 1985 - IEEE Computer Society 1985

Intelligent Robots and Computer Vision - David Paul Casasent 1985

The Impact of Processing Techniques on Communications - J.K. Skwirzynski 2012-12-06
This volume contains the full proceedings of the Fourth Advanced Study Institute organised by myself and my colleagues in . * the field of Communication Theory and Allied Subjects. In the first Institute we associated the subject of signal processing in communication with that in control engineering. Then we concentrated on noise and random phenomena by bringing in as well the subject of stochastic calculus. The third time our subject was multi-user communication and associated with it, the important problem of assessing algorithmic complexity. This time we are concerned with the vast increase of computational power that is now available in communication systems processors and controllers. This forces a mathematical, algorithmic and structural approach to the solution of computational requirements and design problems, in contrast to previous heuristic and intuitive methods. We are also concerned with the interactions and trade-offs between the structure, speed, and complexity of a process, and between software and hardware implementations. At the previous Advanced Study Institute in this series, on Multi-User Communications, there was a session on computational complexity, applied particularly to network routing problems. It was the aim of this Institute to expand this topic and to link it with information theory, random processes, pattern analysis, and implementation aspects of communication processors. The first part of these proceedings concentrates on pattern and structure in communications processing. In organising this session I was greatly helped and guided by Professor P. G. Farrell and Professor J. L. Massey.

Cobblestones - Herbert Freeman 2009-02-19
An autobiographical story, Cobblestones describes the life story of the author from his early days in Germany, his emigration during the Nazi period, his separation from his family and his difficulties in obtaining a visa to come to the United States, resolved finally only through the intercession of Professor Albert Einstein. In his new country he had to learn English and adapt to the new countrys culture in Waterford, NY, a small central New York village, and later Cohoes, NY where he graduated as valedictorian of his high school class. After college and graduate school, he joined industry and within a decade rose to head a department with over 100 persons. This was followed by a move to academia - New York University, then Rensselaer Polytechnic Institute, and finally Rutgers University, from where he retired. In industry he designed one of the early computers (for which he received the IEEE Pioneer Award). He was active in some of the leading computer professional organizations, traveled widely in the US, Europe, Asia, and South America, and received many awards. Just prior to retirement he founded and successfully led a pioneering software company for eight years.

Applications of Computer Vision in Fashion and Textiles - Calvin Wong 2017-10-20
Applications of Computer Vision in Fashion and Textiles provides a systematic and comprehensive discussion of three key areas that are taking advantage of developments in computer vision technology, namely textile defect detection and quality control, fashion recognition and 3D modeling, and 2D and 3D human body modeling for improving clothing fit. It introduces the fundamentals of computer vision techniques for fashion and textile applications, also reviewing computer vision techniques for textile quality control, including chapters on wavelet transforms, Gibor filters, Fourier transforms, and neural network techniques. Final sections cover recognition, modeling, retrieval technologies and advanced human shape modeling techniques. The book is essential reading for scientists and researchers working in the field of fashion production, quality assurance, product development, textiles, fashion supply chain managers, R&D professionals and managers in the textile industry. Explores computer vision technology with reference to improving budget, quality and schedule control in textile manufacturing Provides a thorough understanding of the role of computer vision in developing intelligent systems for the fashion and textiles industries Elucidates the connections between human body modeling technology and intelligent manufacturing systems

Machine Vision - E. R. Davies 2014-07-10
Machine Vision: Theory, Algorithms, Practicalities covers the limitations, constraints, and tradeoffs of vision algorithms. This book is organized into four parts encompassing 21 chapters that tackle general topics, such as noise suppression, edge detection, principles of illumination, feature recognition, Bayes' theory, and Hough transforms. Part 1 provides research ideas on imaging and image filtering operations, thresholding techniques, edge detection, and binary shape and boundary pattern analyses. Part 2 deals with the area of intermediate-level vision, the nature of the Hough transform, shape detection, and corner location. Part 3 demonstrates some of the practical applications of the basic work previously covered in the book. This part also discusses some of the principles underlying implementation, including on lighting and hardware systems. Part 4 highlights the limitations and constraints of vision algorithms and their

corresponding solutions. This book will prove useful to students with undergraduate course on vision for electronic engineering or computer science.

Automation in Garment Manufacturing - Rajkishore Nayak 2017-11-10

Automation in Garment Manufacturing provides systematic and comprehensive insights into this multifaceted process. Chapters cover the role of automation in design and product development, including color matching, fabric inspection, 3D body scanning, computer-aided design and prototyping. Part Two covers automation in garment production, from handling, spreading and cutting, through to finishing and pressing techniques. Final chapters discuss advanced tools for assessing productivity in manufacturing, logistics and supply-chain management. This book is a key resource for all those engaged in textile and apparel development and production, and is also ideal for academics engaged in research on textile science and technology. Delivers theoretical and practical guidance on automated processes that benefit anyone developing or manufacturing textile products Offers a range of perspectives on manufacturing from an international team of authors Provides systematic and comprehensive coverage of the topic, from fabric construction, through product development, to current and potential applications

Advances in Automation and Robotics - George N. Saridis 1985

Intelligent Robots and Computer Vision - 1993

Advances in Machine Vision - Jorge L.C. Sanz 2012-12-06

Machine Vision technology is becoming an indispensible part of the manufacturing industry. Biomedical and scientific applications of machine vision and imaging are becoming more and more sophisticated, and new applications continue to emerge. This book gives an overview of ongoing research in machine vision and presents the key issues of scientific and practical interest. A selected board of experts from the US, Japan and Europe provides an insight into some of the latest work done on machine vision systems and appliccations.

Vision and Information Processing for Automation - A. Browne 2013-11-11

Developments in electronic hardware, particularly microprocessors and solid-state cameras, have resulted in a vast explosion in the range and variety of applications to which intelligent processing may be applied to yield cost-effective automation. Typical examples include automated visual inspection and repetitive assembly. The technology required is recent and specialized, and is thus not widely known. VISION AND INFORMATION PROCESSING FOR AUTOMATION has arisen from a short course given by the authors to introduce potential users to the technology. Its content is a development and extension of material presented in the course. The objective of the book is to introduce readers to modern concepts and techniques basic to intelligent automation, and explain how these are applied to prac tical problems. Its emphasis is on machine vision. Intelligent instrumentation is concerned with processing infor mation, and an appreciation of the nature of information is essential in configuring instrumentation to handle it effiCiently. An understand ing of the fundamental principles of efficient computation and of the way in which machines make decisions is vital for the same reasons. Selection of appropriate sensing (e.g., camera type and configuration), of illumination, of hardware for processing (microchip or parallel processor?) to give most effective information flow, and of the most appropriate processing algorithms is critical in obtaining an optimal solution. Analysis of performance, to demonstrate that requirements have been met, and to identify the causes if they have not, is also important. All of these topics are covered in this volume.

Computer Vision, Imaging and Computer Graphics: Theory and Applications - AlpeshKumar Ranchordas 2010-08-16

This book includes extended versions of the selected papers from VISIGRAPP 2009, the International Joint Conference on Computer Vision, Imaging and Computer Graphics Theory and Applications, which was held in Lisbon, Portugal, during February 5–8, 2009 and organized by the Institute for Systems and Technologies of Information, Control and Communication (INSTICC). VISIGRAPP comprises three component conferences, namely, the International Conference on Computer Vision Theory and Applications (VISAPP), the International Conference on Computer Graphics Theory and Applications (GRAPP), and the International Conference on Imaging Theory and Applications (IMAGAPP). VISIGRAPP received a total of 422 paper submissions from more than 50 co- tries. From these, and after a rigorous double-blind evaluation method, 72 papers were published as full papers. These figures show that this conference is now an - tablished venue for researchers in the broad fields of computer vision, computer graphics and image analysis. From the full papers, 25 were selected for inclusion in this book. The selection process was based on the scores assigned by the Program Committee reviewers as well as the Session Chairs. After selection, the papers were further revised and extended by the authors. Our gratitude goes to all contributors and referees, without whom this book would not have been possible.

Optical Microlithography - 1985

Intelligent Imaging and Analysis - Dae-Eun Kim 2020-03-05

Imaging and analysis are widely involved in various research fields, including biomedical applications, medical imaging and diagnosis, computer vision, autonomous driving, and robot controls. Imaging and analysis are now facing big changes regarding intelligence, due to the breakthroughs of artificial intelligence techniques, including deep learning. Many difficulties in image generation, reconstruction, de-noising skills, artifact removal, segmentation, detection, and control tasks are being overcome with the help of advanced artificial intelligence approaches. This Special Issue focuses on the latest developments of learning-based intelligent imaging techniques and subsequent analyses, which include photographic imaging, medical imaging, detection, segmentation, medical diagnosis, computer vision, and vision-based robot control. These latest technological developments will be shared through this Special Issue for the various researchers who are involved with imaging itself, or are using image data and analysis for their own specific purposes.

Picture Engineering - K.S. Fu 2012-12-06

Machine Vision Inspection Systems, Machine Learning-Based Approaches - Muthukumaran Malarvel 2021-02-24

Machine Vision Inspection Systems (MVIS) is a multidisciplinary research field that emphasizes image processing, machine vision and, pattern recognition for industrial applications. Inspection techniques are generally used in destructive and non-destructive evaluation industry. Now a day's the current research on machine inspection gained more popularity among various researchers, because the manual assessment of the inspection may fail and turn into false assessment due to a large number of examining while inspection process. This volume 2 covers machine learning-based approaches in MVIS applications and it can be employed to a wide diversity of problems particularly in Non-Destructive testing (NDT), presence/absence detection, defect/fault detection (weld, textile, tiles, wood, etc.), automated vision test & measurement, pattern matching, optical character recognition & verification (OCR/OCV), natural language processing, medical diagnosis, etc. This edited book is designed to address various aspects of recent methodologies, concepts, and research plan out to the readers for giving more depth insights for perusing research on machine vision using machine learning-based approaches.

Robot Vision - Azriel Rosenfeld 1982

Progress in Pattern Recognition 1 - L.N. Kanal 2014-06-28

Progress in Pattern Recognition 1

Proceedings 3, COMPSAC79, the IEEE Computer Society's Third International Computer Software & Applications Conference, November 5, Tutorial, November 6-8, 1979, Conference, the Palmer House, Chicago, Illinois - 1979

Applications of Pattern Recognition - King-Sun Fu 2019-07-22

This monograph is intended to cover several major applications of pattern recognition. After a brief introduction to pattern recognition in Chapter 1, the two major approaches, statistical approach and syntactic approach, are reviewed in Chapter 2, and 3, respectively. Other topics include the application of pattern recognition to seismic wave interpretation, to system reliability problems, to medical data analysis, as well as character and speech recognition.

Pattern Formation by Dynamic Systems and Pattern Recognition - Hermann Haken 2012-12-06
This book contains the manuscripts of the papers delivered at the International Sym posium on Synergetics held at SchloB Elmau, Bavaria, Germany, from April 30 until May 5, 1979. This conference followed several previous ones (Elmau 1972, Sicily 1974, Elmau 1977). This time the subject of the symposium was "pattern formation by dynam ic systems and pattern recognition". The meeting brought together scientists from such diverse fields as mathematics, physics, chemistry, biology, history as well as experts in the fields of pattern recognition and associative memory. When I started this type of conference in 1972 it appeared to be a daring enter prise. Indeed, we began to explore virgin land of science: the systematic study of cooperative effects in physical systems far from equi~ibrium and in other disciplines. Though these meetings were attended by scientists from quite different disciplines, a basic concept and even a common language were found from the very beginning. The idea that there exist profound analogies in the behaviour of large classes of complex systems, though the systems themselves may be quite different, proved to be most fruitful. I was delighted to see that over the past one or two years quite similar conferences were now held in various places allover the world. The inclusion of prob lems of pattern recognition at the present meeting is a novel feature, however.
Technological Developments in Education and Automation - Magued Iskander 2010-01-30
Technological Developments in Education and Automation includes set of rigorously reviewed world-class manuscripts dealing with the increasing role of technology in daily lives including education and industrial automation Technological Developments in Education and Automation contains papers presented at the International Conference on Industrial Electronics, Technology & Automation and the International Conference on Engineering Education, Instructional Technology, Assessment, and E-learning which were part of the International Joint Conferences on Computer, Information and Systems Sciences and Engineering
Ultrasonic and Advanced Methods for Nondestructive Testing and Material Characterization - C. H. Chen 2007
Ultrasonic methods have been very popular in nondestructive testing and characterization of materials. This book deals with both industrial ultrasound and medical ultrasound. The advantages of ultrasound include flexibility, low cost, in-line operation, and providing data in both signal and image formats for further analysis. The book devotes 11 chapters to ultrasonic methods. However, ultrasonic methods can be much less effective with some applications. So the book also has 14 chapters catering to other or advanced methods for nondestructive testing or material characterization. Topics like structural health monitoring, Terahertz methods, X-ray and thermography methods are presented. Besides different sensors for nondestructive testing, the book places much emphasis on signal/image processing and pattern recognition of the signals acquired.
International Encyclopedia of Robotics - 1988

Applications of Computer Vision in Automation and Robotics - Krzysztof Okarma 2021-01-28
This book presents recent research results related to various applications of computer vision methods in the widely understood contexts of automation and robotics. As the current progress of image analysis applications may be easily observed in various areas of everyday life, it becomes one of the most essential elements of development of Industry 4.0 solutions. Some of the examples, partially discussed in individual chapters, may be related to the visual navigation of mobile robots and drones, monitoring of industrial production lines, non-destructive evaluation and testing, monitoring of the IoT devices or the 3D printing process and the quality assessment of manufactured objects, video surveillance systems, and decision support in autonomous vehicles.
Evolutionary Computer Vision - Gustavo Olague 2016-09-28
This book explains the theory and application of evolutionary computer vision, a new paradigm where challenging vision problems can be approached using the techniques of evolutionary computing. This methodology achieves excellent results for defining fitness functions and representations for problems by merging evolutionary computation with mathematical optimization to produce automatic creation of emerging visual behaviors. In the first part of the book the author surveys the literature in concise form, defines the relevant terminology, and offers historical and philosophical motivations for the key research problems in the field. For researchers from the computer vision community, he offers a simple introduction to the evolutionary computing paradigm. The second part of the book focuses on implementing evolutionary algorithms that solve given problems using working programs in the major fields of low-, intermediate- and high-level computer vision. This book will be of value to researchers, engineers, and students in the fields of computer vision, evolutionary computing, robotics, biologically inspired mechatronics, electronics engineering, control, and artificial intelligence.
Pictorial Data Analysis - Robert M. Haralick 2012-12-06
This volume is the collection of lectures and presentations of the NATO AS! On Pictorial Data Analysis, held August 1-12, 1982 in the beautiful chateau de Bonas, Bonas France. The director of the AS! was Robert M. Haralick and the Co-director was Stefano Levialdi. The papers in the book are arranged in two sections first theory and general prinicples and then applications. Local computations play a central role in image processing both when a traditional computer is used and when parallel machines are used for improving image throughput. Levialdi reviews such neighborhood operators. Hung and Kasvand discuss a line thinning application which involves detection of critical points on chain encoded data. Most low level image processing has been done using the digital raster as the basic data structure. Within the last few years many of these basic algorithms have been developed for the quadtree data structure. The quadtree permits easier access to certain kinds of spatial adjacency relationships in a variable resolution context. Rosenfeld reviews the properties of these representations and their uses in image segmentation and property measurement. Besslich discusses an expanded form of an invertible quadtree representation which permits a multiprocessor execution. Gisolfi and Vitulano discuss the C-matrix and C-filtering technique for image and texture feature extraction. O'mara et.al. discuss the application of Codel numbers to image feature extraction. Kropatsch discusses an image segmentation technique which permits the effective use of a variety of different kinds of segmentation techniques.
Fundamentals of Robotics - David Ardayfio 2020-07-24
Fundamentals of Robotics presents the basic concepts of robots to engineering and technology students and to practicing engineers who want to grasp the fundamentals in the growing field of robotics.
A Guide for Machine Vision in Quality Control - Sheila Anand 2019-12-23
Machine Vision systems combine image processing with industrial automation. One of the primary areas of application of Machine Vision in the Industry is in the area of Quality Control. Machine vision provides fast, economic and reliable inspection that improves quality as well as business productivity. Building machine vision applications is a challenging task as each application is unique, with its own requirements and desired outcome. A Guide to Machine Vision in Quality Control follows a practitioner’s approach to learning machine vision. The book provides guidance on how to build machine vision systems for quality inspections. Practical applications from the Industry have been discussed to provide a good understanding of usage of machine vision for quality control. Real-world case studies have been used to explain the process of building machine vision solutions. The book offers comprehensive coverage of the essential topics, that includes: Introduction to Machine Vision Fundamentals of Digital Images Discussion of various machine vision system components Digital image processing related to quality control Overview of automation The book can be used by students and academics, as well as by industry professionals, to understand the fundamentals of machine vision. Updates to the on-going technological innovations have been provided with a discussion on emerging trends in machine vision and smart factories of the future. Sheila Anand is a PhD graduate and Professor at Rajalakshmi Engineering College, Chennai, India. She has over three decades of experience in teaching, consultancy and research. She has worked in the software industry and has extensive experience in development of software applications and in systems audit of financial, manufacturing and trading organizations. She guides Ph.D. aspirants and many of her research scholars have since been awarded their doctoral degree. She has published many papers in national and international journals and is a reviewer for several journals of repute. L Priya is a PhD graduate working as Associate Professor and Head, Department of Information Technology at Rajalakshmi Engineering College, Chennai, India. She has nearly two decades of teaching experience and good exposure to consultancy and research. She has delivered many invited talks, presented papers and won several paper awards in

International Conferences. She has published several papers in International journals and is a reviewer for SCI indexed journals. Her areas of interest include Machine Vision, Wireless Communication and Machine Learning.

17th International Conference on Soft Computing Models in Industrial and Environmental Applications (SOCO 2022) - Pablo García Bringas 2022-11-12

This book contains accepted papers presented at SOCO 2022 conference held in the beautiful and historic city of Salamanca (Spain), in September 2022. Soft computing represents a collection or set of computational techniques in machine learning, computer science, and some engineering disciplines, which investigate, simulate, and analyze very complex issues and phenomena. After a thorough peer-review process, the 17th SOCO 2022 International Program Committee selected 64 papers which are published in these conference proceedings and represent an acceptance rate of 60%. In this relevant edition, a particular emphasis was put on the organization of special sessions. Seven special sessions were organized related to relevant topics such as machine learning and computer vision in Industry 4.0; time series forecasting in industrial and environmental applications; optimization, modeling, and control by soft computing techniques; soft computing applied to renewable energy systems; preprocessing big data in machine learning; tackling real-world problems with artificial intelligence. The selection of papers was extremely rigorous to maintain the high quality of the conference. We want to thank the members of the program committees for their hard work during the reviewing process. This is a crucial process for creating a high-standard conference; the SOCO conference would not exist without their help.

Optical Microlithography III - Harry L. Stover 1984

Research Techniques in Nondestructive Testing - Roy Samuel Sharpe 1970

Syntactic and Structural Pattern Recognition — Theory and Applications - H Bunke 1990-01-01

This book is currently the only one on this subject containing both introductory material and advanced recent research results. It presents, at one end, fundamental concepts and notations developed in syntactic and structural pattern recognition and at the other, reports on the current state of the art with respect to both methodology and applications. In particular, it includes artificial intelligence related techniques, which are likely to become very important in future pattern recognition. The book consists of individual chapters written by different authors. The chapters are grouped into broader subject areas like “Syntactic Representation and Parsing”, “Structural Representation and Matching”, “Learning”, etc. Each chapter is a self-contained presentation of one particular topic. In order to keep the original flavor of each contribution, no efforts were undertaken to unify the different chapters with respect to notation. Naturally, the self-containedness of the individual chapters results in some redundancy. However, we believe that this handicap is compensated by the fact that each contribution can be read individually without prior study of the preceding chapters. A unification of the spectrum of material covered by the individual chapters is provided by the subject and author index included at the end of the book. Contents:Introduction and Overview (M G Thomason)String Grammars for Syntactic Pattern Recognition (H Bunke)Parsing and Error-Correcting Parsing for String Grammars (E Tanaka)Array, Tree, and Graph Grammars (A Rosenfeld)String Matching for Structural Pattern Recognition (H Bunke)Matching Tree Structures (A Sanfeliu)Matching Relational Structures Using Discrete Relaxation (L G Shapiro & R M Haralick)Random Graphs (A K C Wong et al.)Grammatical Inference (L Miclet)An Algorithm for Inferring Context-Free Array Grammars (P S P Wang & X W Dai)Hybrid Pattern Recognition Methods (H Bunke)Combining Statistical and Structural Methods (W H Tsai)Industrial Applications (H S Baird)Three-Dimensional Object Recognition by Attributed Graphs (E K Wong)Chinese Character Recognition (J W Tai & Y J Liu)Table Driven Parsing for Shape Analysis (T C Henderson & A Samal)A General Purpose Line Drawing Analysis System (R Mohr)ECG Analysis (E Skordalakis) Readership: Graduates, undergraduates, researchers and practising professionals in pattern recognition.

Advances in Visual Computing - George Bebis 2016-12-09

The two volume set LNCS 10072 and LNCS 10073 constitutes the refereed proceedings of the 12th International Symposium on Visual Computing, ISVC 2016, held in Las Vegas, NV, USA in December 2016. The 102 revised full papers and 34 poster papers presented in this book were carefully reviewed and selected from 220 submissions. The papers are organized in topical sections: Part I (LNCS 10072) comprises computational bioimaging; computer graphics; motion and tracking; segmentation; pattern recognition; visualization; 3D mapping; modeling and surface reconstruction; advancing autonomy for aerial robotics; medical imaging; virtual reality; computer vision as a service; visual perception and robotic systems; and biometrics. Part II (LNCS 9475): applications; visual surveillance; computer graphics; and virtual reality.

Advances in Image and Video Technology - Domingo Mery 2007-12-07

This book constitutes the refereed proceedings of the Second Pacific Rim Symposium on Image and Video Technology, PSIVT 2007, held in Santiago, Chile, in December 2007. The 75 revised full papers presented together with four keynote lectures were carefully reviewed and selected from 155 submissions. The symposium features ongoing research including all aspects of video and multimedia, both technical and artistic perspectives and both theoretical and practical issues.

1984 IEEE Computer Society Workshop on Visual Languages - 1984

Bulletin of the Japan Society of Precision Engineering - Seiki Gakkai (Japan) 1983

IEEE Computer Society Conference on Pattern Recognition and Image Processing - 1977

Computer and Machine Vision - E. R. Davies 2012-03-05

Computer and Machine Vision: Theory, Algorithms, Practicalities (previously entitled Machine Vision) clearly and systematically presents the basic methodology of computer and machine vision, covering the essential elements of the theory while emphasizing algorithmic and practical design constraints. This fully revised fourth edition has brought in more of the concepts and applications of computer vision, making it a very comprehensive and up-to-date tutorial text suitable for graduate students, researchers and R&D engineers working in this vibrant subject. Key features include: Practical examples and case studies give the 'ins and outs' of developing real-world vision systems, giving engineers the realities of implementing the principles in practice. New chapters containing case studies on surveillance and driver assistance systems give practical methods on these cutting-edge applications in computer vision. Necessary mathematics and essential theory are made approachable by careful explanations and well-illustrated examples. Updated content and new sections cover topics such as human iris location, image stitching, line detection using RANSAC, performance measures, and hyperspectral imaging. The 'recent developments' section now included in each chapter will be useful in bringing students and practitioners up to date with the subject. Roy Davies is Emeritus Professor of Machine Vision at Royal Holloway, University of London. He has worked on many aspects of vision, from feature detection to robust, real-time implementations of practical vision tasks. His interests include automated visual inspection, surveillance, vehicle guidance and crime detection. He has published more than 200 papers, and three books - Machine Vision: Theory, Algorithms, Practicalities (1990), Electronics, Noise and Signal Recovery (1993), and Image Processing for the Food Industry (2000); the first of these has been widely used internationally for more than 20 years, and is now out in this much enhanced fourth edition. Roy holds a DSc at the University of London, and has been awarded Distinguished Fellow of the British Machine Vision Association, and Fellow of the International Association of Pattern Recognition.