Machine Vision

The second edition of this successful machine vision textbook is completely updated, revised and expanded by 35% to reflect the developments of recent years in the fields of image acquisition, machine vision algorithms and applications. The new content includes, but is not limited to, a discussion of new camera and image acquisition interfaces, 3D sensors and technologies, 3D reconstruction, 3D object recognition and state-of-the-art classification algorithms. The authors retain their balanced approach with sufficient coverage of the theory and a strong focus on applications. All examples are based on the latest version of the machine vision software HALCON 13.

This 2004 book is an accessible and comprehensive introduction to machine vision. It provides all the necessary theoretical tools and shows how they are applied in actual image processing and machine vision systems. A key feature is the inclusion of many programming exercises that give insights into the development of practical image processing algorithms. The authors begin with a review of mathematical principles and go on to discuss key issues in image processing such as the description and characterization of images, edge detection, restoration and feature extraction, segmentation, texture and shape. They also discuss image matching, statistical pattern recognition, clustering, and syntactic pattern recognition. Important applications are described, including optical character recognition and automatic target recognition.

Software and data used in the book can be found at www.cambridge.org/9780521830461. A useful reference for practitioners, the book is aimed at graduate students in electrical engineering, computer science and mathematics.

Machine Vision for Three-Dimensional Scenes contains the proceedings of the workshop "Machine Vision - Acquiring and Interpreting the 3D Scene" sponsored by the Center for Computer Aids for Industrial Productivity (CAIP) at Rutgers University and held in April 1989 in New Brunswick, New Jersey. The papers explore the applications of machine vision in image acquisition and 3D scene interpretation and cover topics such as segmentation of multi-sensor images; the placement of sensors to minimize occlusion; and the use of light striping to obtain range data. Comprised of 14 chapters, this book opens with a discussion on 3D object recognition and the problems that arise when dealing with large object databases, along with solutions to these problems. The reader is then introduced to the free-form surface matching problem and object recognition by constrained search. The following chapters address the problem of machine vision inspection, paying particular attention to the use of eye tracking to train a vision system; images of 3D scenes and the attendant problems of image understanding; the problem of object motion; and real-time range mapping. The final chapter assesses the relationship between the developing machine vision technology and the marketplace. This monograph will be of interest to practitioners in the fields of

computer science and applied mathematics.

This edited book brings together leading researchers, academic scientists and research scholars to put forward and share their experiences and research results on all aspects of an inspection system for detection analysis for various machine vision applications. It also provides a premier interdisciplinary platform to present and discuss the most recent innovations, trends, methodology, applications, and concerns as well as practical challenges encountered and solutions adopted in the inspection system in terms of image processing and analytics of machine vision for real and industrial application. Machine vision inspection systems (MVIS) utilized all industrial and non-industrial applications where the execution of their utilities based on the acquisition and processing of images. MVIS can be applicable in industry, governmental, defense, aerospace, remote sensing, medical, and academic/education applications but constraints are different. MVIS entails acceptable accuracy, high reliability, high robustness, and low cost. Image processing is a well-defined transformation between human vision and image digitization, and their techniques are the foremost way to experiment in the MVIS. The digital image technique furnishes improved pictorial information by processing the image data through machine vision perception. Digital image processing has widely been used 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), barcode reading and traceability, medical diagnosis, weather forecasting, face recognition, defence and space research, 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 image processing techniques.

This text features a broad array of research efforts in computer vision including low level processing, perceptual organization, object recognition and active vision. The volume's nine papers specifically report on topics such as sensor confidence, low level feature extraction schemes, non-parametric multi-scale curve smoothing, integration of geometric and non-geometric attributes for object recognition, design criteria for a four degree-of-freedom robot head, a real-time vision system based on control of visual attention and a behavior-based active eye vision system. The scope of the book provides an excellent sample of current concepts, examples and applications from multiple areas of computer vision. Contents:Range Estimation from Camera Blur by Regularized Adaptive Identification (L F Holeva)Modeling Sensor Confidence for Sensor Integration Tasks (K Hughes & N Ranganathan)From 3-D Scattered Data to Geometric Signal Description: Invariant Stable Recovery of Straight Line Segments (P Hébert et al.)Feature Extraction and Matching as Signal Detection (X-P Hu & N Ahuja)Non-Parametric Multiscale Curve Smoothing (P L Rosin)Integration of Geometric

and Non-Geometric Attributes for Fast Object Recognition (L Grewe & A Kak)A Four Degree-of-Freedom Robot Head for Active Vision (F-L Du & M Brady)Control of Eye and Arm Movements Using Active, Attentional Vision (P A Sandon)Behavior-Based Active Vision (C S Pinhanez) Readership: Computer scientists and engineers. keywords:

Machine Vision Algorithms and ApplicationsJohn Wiley & Sons

A number of important aspects of intelligent machine vision in one volume, describing the state of the art and current developments in the field, including: fundamentals of 'intelligent'image processing for machine vision systems; algorithm optimisation; implementation in high-speed electronic digital hardware; implementation in an integrated high-level software environment and applications for industrial product quality and process control. Backed by numerous illustrations, created using the authors IP software, this book will be of interest to researchers in the field of machine vision wishing to understand the discipline and develop new techniques. Also useful for under- and postgraduates.

This book presents key machine vision techniques and algorithms, along with the associated Java source code. Special features include a complete self-contained treatment of all topics and techniques essential to the understanding and implementation of machine vision; an introduction to object-oriented programming and to the Java programming language, with particular reference to its imaging capabilities;

Java source code for a wide range of real-world image processing and analysis functions; an introduction to the Java 2D imaging and Java Advanced Imaging (JAI) API; and a wide range of illustrative examples.

This book presents a variety of perspectives on vision-based applications. These contributions are focused on optoelectronic sensors, 3D & 2D machine vision technologies, robot navigation, control schemes, motion controllers, intelligent algorithms and vision systems. The authors focus on applications of unmanned aerial vehicles, autonomous and mobile robots, industrial inspection applications and structural health monitoring. Recent advanced research in measurement and others areas where 3D & 2D machine vision and machine control play an important role, as well as surveys and reviews about vision-based applications. These topics are of interest to readers from diverse areas, including electrical, electronics and computer engineering, technologists, students and non-specialist readers. • Presents current research in image and signal sensors, methods, and 3D & 2D technologies in vision-based theories and applications; • Discusses applications such as daily use devices including robotics, detection, tracking and stereoscopic vision systems, pose estimation, avoidance of objects, control and data exchange for navigation, and aerial imagery processing; • Includes research contributions in scientific, industrial, and civil applications.

This practical book shows you how to employ machine learning models to extract information from images. ML engineers and data scientists will learn how to solve a variety of image problems including classification, object detection, autoencoders, image generation, counting, and captioning with proven ML techniques. This book provides a great introduction to end-to-end deep learning: dataset creation, data preprocessing, model design, model training, evaluation, deployment, and interpretability. Google engineers Valliappa Lakshmanan, Martin Görner, and Ryan Gillard show you how to develop accurate and explainable computer vision ML models and put them into large-scale production using robust ML architecture in a flexible and maintainable way. You'll learn how to design, train, evaluate, and predict with models written in TensorFlow or Keras. You'll learn how to: Design ML architecture for computer vision tasks Select a model (such as ResNet, SqueezeNet, or EfficientNet) appropriate to your task Create an end-to-end ML pipeline to train, evaluate, deploy, and explain your model Preprocess images for data augmentation and to support learnability Incorporate explainability and responsible AI best practices Deploy image models as web services or on edge devices Monitor and manage ML models

Machine Vision for Inspection and Measurement contains the proceedings of the

Second Annual Workshop on Machine Vision sponsored by the Center for Computer Aids for Industrial Productivity (CAIP) at Rutgers University and held on April 25-26, 1988 in New Brunswick, New Jersey. The papers explore the application of machine vision to inspection and measurement and cover topics such as the problem of object-pose estimation and depth recovery through inverse optics. The use of machine vision techniques in inspection of integrated circuits and semiconductor wafers is also discussed. Comprised of 11 chapters, this book opens with the problem of using fine-grained parallel machines for VLSI inspection. The discussion then turns to a variety of real-life applications of machine vision, including inspection of integrated circuits, semiconductor wafers, TV-tube glass, and mechanical parts. The use of machine vision to measure the curvature of the human cornea for vision correction and contact lens fitting purposes is also considered. The remaining chapters focus on motion estimation from stereo sequences using orthographic-view algorithms; photometric sampling for determining surface shape and reflectance; and efficient depth recovery by means of inverse optics. A chapter addresses the question of whether the industry is ready for machine vision and comes up with some optimistic predictions. This monograph will be of interest to practitioners in the fields of computer science and applied mathematics.

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.
The book offers a thorough introduction to machine vision. It is organized in two parts. The first part covers the image acquisition, which is the crucial component of most automated visual inspection systems. All important methods are described in great detail and are presented with a reasoned structure. The second part deals with the modeling and processing of image signals and pays particular regard to methods, which are relevant for automated visual inspection. With the ongoing release of 3D movies and the emergence of 3D TVs, 3D imaging technologies have penetrated our daily lives. Yet choosing from the numerous 3D vision methods available can be frustrating for scientists and engineers, especially without a comprehensive resource to consult. Filling this gap, Handbook of 3D Machine Vision: Optical Metro
Machine vision technology has revolutionised the process of automated

inspection in manufacturing. The specialist techniques required for inspection of natural products, such as food, leather, textiles and stone is still a challenging area of research. Topological variations make image processing algorithm development, system integration and mechanical handling issues much more complex. The practical issues of making machine vision systems operate robustly in often hostile environments together with the latest technological advancements are reviewed in this volume. Features: - Case studies based on real-world problems to demonstrate the practical application of machine vision systems. - In-depth description of system components including image processing, illumination, real-time hardware, mechanical handling, sensing and on-line testing. - Systems-level integration of constituent technologies for bespoke applications across a variety of industries. - A diverse range of example applications that a system may be required to handle from live fish to ceramic tiles. Machine Vision for the Inspection of Natural Products will be a valuable resource for researchers developing innovative machine vision systems in collaboration with food technology, textile and agriculture sectors. It will also appeal to practising engineers and managers in industries where the application of machine vision can enhance product safety and process efficiency. 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 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

The following are the proceedings of the Third International Workshop on Perception held in Pavia, Italy, on September 27-30, 1993, under the auspices of four institutions: the Group of Cybernetic and Biophysics (GNCB)s of the National Research Council (CNR), the Italian Association for Artificial Intelligence (AI * IA), the Italian Association of Psychology (AIP), and the Italian Chapter of the International Association for Pattern Recognition (IAPR). The theme of this third workshop was: "Human and Machine Vision: Analogies and Divergencies." A wide spectrum of topics was covered, ranging from neurophysiology, to computer architecture, to psychology, to image understanding, etc. For this reason the structure of this workshop was quite different from those of the first two held in Parma (1991), and Trieste (1992). This time the workshop was composed of just eight modules, each one consisting of two invited lectures (dealing with vision in nature and machines, respectively) and a common panel discussion (including the two lecturers and three invited panellists).

A 2004 introduction to machine vision that includes many programming exercises.

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.

The second edition of this accepted reference work has been updated to reflect the rapid developments in the field and now covers both 2D and 3D imaging. Written by expert practitioners from leading companies operating in machine

vision, this one-stop handbook guides readers through all aspects of image acquisition and image processing, including optics, electronics and software. The authors approach the subject in terms of industrial applications, elucidating such topics as illumination and camera calibration. Initial chapters concentrate on the latest hardware aspects, ranging from lenses and camera systems to camera-computer interfaces, with the software necessary discussed to an equal depth in later sections. These include digital image basics as well as image analysis and image processing. The book concludes with extended coverage of industrial applications in optics and electronics, backed by case studies and design strategies for the conception of complete machine vision systems. As a result, readers are not only able to understand the latest systems, but also to plan and evaluate this technology. With more than 500 images and tables to illustrate relevant principles and steps.

For both students and engineers in R&D, this book explains machine vision in a concise, hands-on way, using the Vision Development Module of the LabView software by National Instruments. Following a short introduction to the basics of machine vision and the technical procedures of image acquisition, the book goes on to guide readers in the use of the various software functions of LabView's machine vision module. It covers typical machine vision tasks, including particle

analysis, edge detection, pattern and shape matching, dimension measurements as well as optical character recognition, enabling readers to quickly and efficiently use these functions for their own machine vision applications. A discussion of the concepts involved in programming the Vision Development Module rounds off the book, while example problems and exercises are included for training purposes as well as to further explain the concept of machine vision. With its step-by-step guide and clear structure, this is an essential reference for beginners and experienced researchers alike.

Image Processing, Analysis and Machine Vision represent an exciting part of modern cognitive and computer science. Following an explosion of inter est during the Seventies, the Eighties were characterized by the maturing of the field and the significant growth of active applications; Remote Sensing, Technical Diagnostics, Autonomous Vehicle Guidance and Medical Imaging are the most rapidly developing areas. This progress can be seen in an in creasing number of software and hardware products on the market as well as in a number of digital image processing and machine vision courses offered at universities world-wide. There are many texts available in the areas we cover - most (indeed, all of which we know) are referenced somewhere in this book. The subject suffers, however, from a shortage of texts at the 'elementary' level - that appropriate for

undergraduates beginning or completing their studies of the topic, or for Master's students - and the very rapid developments that have taken and are still taking place, which quickly age some of the very good text books produced over the last decade or so. This book reflects the authors' experience in teaching one and two semester undergraduate and graduate courses in Digital Image Processing, Digital Image Analysis, Machine Vision, Pattern Recognition and Intelligent Robotics at their respective institutions.

Aimed at manufacturing managers and engineers looking for an introduction to computer vision and its potential, this book discusses the areas in which machine vision is being used, explains different types of machine vision hardware and software and summarizes research at several universities.

Computer vision and machine intelligence paradigms are prominent in the domain of medical image applications, including computer assisted diagnosis, image guided radiation therapy, landmark detection, imaging genomics, and brain connectomics. Medical image analysis and understanding are daunting tasks owing to the massive influx of multi-modal medical image data generated during routine clinal practice. Advanced computer vision and machine intelligence approaches have been employed in recent years in the field of image processing and computer vision. However, due to the unstructured nature of medical imaging

data and the volume of data produced during routine clinical processes, the applicability of these meta-heuristic algorithms remains to be investigated. Advanced Machine Vision Paradigms for Medical Image Analysis presents an overview of how medical imaging data can be analyzed to provide better diagnosis and treatment of disease. Computer vision techniques can explore texture, shape, contour and prior knowledge along with contextual information, from image sequence and 3D/4D information which helps with better human understanding. Many powerful tools have been developed through image segmentation, machine learning, pattern classification, tracking, and reconstruction to surface much needed quantitative information not easily available through the analysis of trained human specialists. The aim of the book is for medical imaging professionals to acquire and interpret the data, and for computer vision professionals to learn how to provide enhanced medical information by using computer vision techniques. The ultimate objective is to benefit patients without adding to already high healthcare costs. Explores major emerging trends in technology which are supporting the current advancement of medical image analysis with the help of computational intelligence Highlights the advancement of conventional approaches in the field of medical image processing Investigates novel techniques and reviews the state-of-the-art in the

areas of machine learning, computer vision, soft computing techniques, as well as their applications in medical image analysis

With the demands of quality management and process control in an industrial environment machine vision is becoming an important issue. This handbook of machine vision is written by experts from leading companies in this field. It goes through all aspects of image acquisition and image processing. From the viewpoint of the industrial application the authors also elucidate in topics like illumination or camera calibration. Attention is paid to all hardware aspects, starting from lenses and camera systems to camera-computer interfaces. Besides the detailed hardware descriptions the necessary software is discussed with equal profoundness. This includes sections on digital image basics as well as image analysis and image processing. Finally the user is introduced to general aspects of industrial applications of machine vision, such as case studies and strategies for the conception of complete machine vision systems. With this handbook the reader will be enabled not only to understand up to date systems for machine vision but will also be qualified for the planning and evaluation of such technology.

This book discusses the use of machine vision and technologies in specific engineering case studies and focuses on how machine vision techniques are impacting every step of industrial processes and how smart sensors and cognitive big data analytics are supporting the automation processes in Industry 4.0 applications. Industry 4.0, the

fourth industrial revolution, combines traditional manufacturing with automation and data exchange. Machine vision is used in industry for reliable product inspections, quality control, and data capture solutions. It combines different technologies to provide important information from the acquisition and analysis of images for robot-based inspection and guidance.

This text is intended to help readers understand and construct machine vision systems that perform useful tasks, based on the state of the art. It covers fundamentals drawn from image processing and computer graphics to the methods of applied machine vision techniques. The text is useful as a short course supplement, as a self-study guide, or as a primary or supplementary text in an advanced undergraduate or graduate course.

A machine vision system should be able to analyze images and produce descriptions of what it "sees". The descriptions should capture the aspects of the objects being imaged and be useful for accomplishing some specific tasks. In this volume a number of subjects are discussed. They include theoretical aspects which focus on shape analysis, special architectures, 3-D image decomposition, inspection by machine vision, and others. Applications include geophysical image analysis, robotics, sparse image understanding, biomedical applications. An ample survey of the present industrial applications is also provided.

" --ChoiceSurveying art history as well as the technologies of war and urban planning,

one of France's leading intellectuals provides an introduction to a new "logistics of the image."

Vision plays a fundamental role for living beings by allowing them to interact with the environment in an effective and efficient way. The ultimate goal of Machine Vision is to endow artificial systems with adequate capabilities to cope with not a priori predetermined situations. To this end, we have to take into account the computing constraints of the hosting architectures and the specifications of the tasks to be accomplished, to continuously adapt and optimize the visual processing techniques. Nevertheless, by exploiting the low?cost computational power of off?the?shell computing devices, Machine Vision is not limited any more to industrial environments, where situations and tasks are simplified and very specific, but it is now pervasive to support system solutions of everyday life problems.

From grading and preparing harvested vegetables to the tactile probing of a patient's innermost recesses, mechatronics has become part of our way of life. This cutting-edge volume features the 30 best papers of the 13th International Conference on Mechatronics and Machine Vision in Practice. Although there is no shortage of theoretical and technical detail in these chapters, they have a common theme in that they describe work that has been applied in practice.

Human and Machine Vision provides information pertinent to an interdisciplinary program of research in visual perception. This book presents a psychophysical study of

the human visual system, which provides insights on how to model the flexibility required by a general-purpose visual system. Organized into 17 chapters, this book begins with an overview of how a visual display is segmented into components on the basis of textual differences. This text then proposes three criteria for judging representations of shape. Other chapters consider an increased use of machine vision programs as models of human vision and of data from human vision in developing programs for machine vision. This book discusses as well the diversity and flexibility of systems for representing visual information. The final chapter deals with dot patterns and discusses the process of interring orientation information from collections of them. This book is a valuable resource for psychologists, neurophysiologists, and computer scientists.

Annotation. 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 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.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. Recently, the algorithms for the processing of the visual information have greatly evolved, providing efficient and effective solutions to cope with the variability and the complexity of real-world environments. These achievements yield to the development of Machine Vision systems that overcome the typical industrial applications, where the environments are controlled and the tasks are very specific, towards the use of innovative solutions to face with everyday needs of people. The Human-Centric Machine Vision can help to solve the problems raised by the needs of our society, e.g. security and safety, health care, medical imaging, and human machine interface. In such applications it is necessary to handle changing, unpredictable and complex situations, and to take care of the presence of humans. In the last 40 years, machine vision has evolved into a mature field embracing a wide range of applications including surveillance, automated inspection, robot assembly, vehicle guidance, traffic monitoring and control, signature verification, biometric measurement, and analysis of remotely sensed images. While researchers and industry specialists continue to document their work in this area, it has become increasingly difficult for professionals and graduate students to understand the essential theory and practicalities well enough to design their own algorithms and systems. This book directly addresses this need. As in earlier editions, E.R. Davies clearly and systematically presents the basic concepts of the field in highly accessible prose and images, covering essential elements of the theory while emphasizing algorithmic

and practical design constraints. In this thoroughly updated edition, he divides the material into horizontal levels of a complete machine vision system. Application case studies demonstrate specific techniques and illustrate key constraints for designing real-world machine vision systems. · Includes solid, accessible coverage of 2-D and 3-D scene analysis. · Offers thorough treatment of the Hough Transform—a key technique for inspection and surveillance. · Brings vital topics and techniques together in an integrated system design approach. · Takes full account of the requirement for real-time processing in real applications.

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.

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