

1. Record Nr.	UNINA9910830036803321
Titolo	Handbook of machine vision // edited by Alexander Hornberg
Pubbl/distr/stampa	Weinheim, [Germany] : , : Wiley-VCH Verlag GmbH & Co. KGaA, , [2006] ©2006
ISBN	1-280-85457-X 9786610854578 3-527-61014-6 3-527-61013-8 9783527610136 (ebook)
Descrizione fisica	1 online resource (821 pages)
Disciplina	621.367
Soggetti	Computer vision Computer vision - Industrial applications
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Note generali	Includes index.
Nota di contenuto	Handbook of Machine Vision; Contents; Preface; 1 Processing of Information in the Human Visual System; 1.1 Preface; 1.2 Design and Structure of the Eye; 1.3 Optical Aberrations and Consequences for Visual Performance; 1.4 Chromatic Aberration; 1.5 Neural Adaptation to Monochromatic Aberrations; 1.6 Optimizing Retinal Processing with Limited Cell Numbers, Space and Energy; 1.7 Adaptation to Different Light Levels; 1.8 Rod and Cone Responses; 1.9 Spiking and Coding; 1.10 Temporal and Spatial Performance; 1.11 ON/OFF Structure, Division of the Whole Illuminance Amplitude in Two Segments 1.12 Consequences of the Rod and Cone Diversity on Retinal Wiring1.13 Motion Sensitivity in the Retina; 1.14 Visual Information Processing in Higher Centers; 1.14.1 Morphology; 1.14.2 Functional Aspects - Receptive Field Structures and Cortical Modules; 1.15 Effects of Attention; 1.16 Color Vision, Color Constancy, and Color Contrast; 1.17 Depth Perception; 1.18 Adaptation in the Visual System to Color, Spatial, and Temporal Contrast; 1.19 Conclusions; References; 2 Introduction to Building a Machine Vision Inspection; 2.1 Preface; 2.2 Specifying a Machine Vision System

2.2.1 Task and Benefit; 2.2.2 Parts; 2.2.2.1 Different Part Types; 2.2.3 Part Presentation; 2.2.4 Performance Requirements; 2.2.4.1 Accuracy; 2.2.4.2 Time Performance; 2.2.5 Information Interfaces; 2.2.6 Installation Space; 2.2.7 Environment; 2.2.8 Checklist; 2.3 Designing a Machine Vision System; 2.3.1 Camera Type; 2.3.2 Field of View; 2.3.3 Resolution; 2.3.3.1 Camera Sensor Resolution; 2.3.3.2 Spatial Resolution; 2.3.3.3 Measurement Accuracy; 2.3.3.4 Calculation of Resolution; 2.3.3.5 Resolution for a Line Scan Camera; 2.3.4 Choice of Camera, Frame Grabber, and Hardware Platform; 2.3.4.1 Camera Model; 2.3.4.2 Frame Grabber; 2.3.4.3 Pixel Rate; 2.3.4.4 Hardware Platform; 2.3.5 Lens Design; 2.3.5.1 Focal Length; 2.3.5.2 Lens Flange Focal Distance; 2.3.5.3 Extension Tubes; 2.3.5.4 Lens Diameter and Sensor Size; 2.3.5.5 Sensor Resolution and Lens Quality; 2.3.6 Choice of Illumination; 2.3.6.1 Concept: Maximize Contrast; 2.3.6.2 Illumination Setups; 2.3.6.3 Light Sources; 2.3.6.4 Approach to the Optimum Setup; 2.3.6.5 Interfering Lighting; 2.3.7 Mechanical Design; 2.3.8 Electrical Design; 2.3.9 Software; 2.3.9.1 Software Library; 2.3.9.2 Software Structure; 2.3.9.3 General Topics; 2.4 Costs; 2.5 Words on Project Realization; 2.5.1 Development and Installation; 2.5.2 Test Run and Acceptance Test; 2.5.3 Training and Documentation; 2.6 Examples; 2.6.1 Diameter Inspection of Rivets; 2.6.1.1 Task; 2.6.1.2 Specification; 2.6.1.3 Design; 2.6.2 Tubing Inspection; 2.6.2.1 Task; 2.6.2.2 Specification; 2.6.2.3 Design; 3 Lighting in Machine Vision; 3.1 Introduction; 3.1.1 Prologue; 3.1.2 The Involvement of Lighting in the Complex Machine Vision Solution; 3.2 Demands on Machine Vision lighting; 3.3 Light used in Machine Vision; 3.3.1 What is Light? Axioms of Light

Sommario/riassunto

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 soft
