

Augmented Vision Perception in Infrared

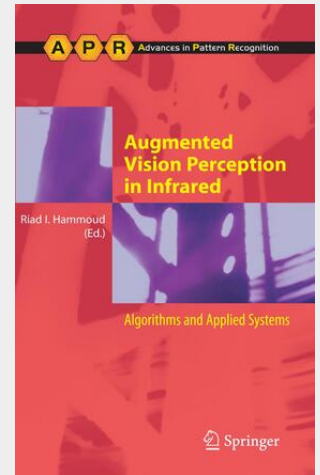
Algorithms and Applied Systems

Throughout much of machine vision's early years the infrared imagery has suffered from return on investment despite its advantages over visual counterparts. Recently, the ?scal momentum has switched in favor of both manufacturers and practitioners of infrared technology as a result of today's rising security and safety challenges and advances in thermographic sensors and their continuous drop in costs. This yielded a great impetus in achieving ever better performance in remote surveillance, object recognition, guidance, noncontact medical measurements, and more. The purpose of this book is to draw attention to recent successful efforts made on merging computer vision applications (nonmilitary only) and nonvisual imagery, as well as to ?ll in the need in the literature for an up-to-date convenient reference on machine vision and infrared technologies. Augmented Perception in Infrared provides a comprehensive review of recent deployment of infrared sensors in modern applications of computer vision, along with in-depth description of the world's best machine vision algorithms and intel- gent analytics. Its topics encompass many disciplines of machine vision, including remote sensing, automatic target detection and recognition, background modeling and image segmentation, object tracking, face and facial expression recognition, - variant shape characterization, disparate sensors fusion, noncontact physiological measurements, night vision, and target classi?cation. Its application scope includes homeland security, public transportation, surveillance, medical, and military. Mo- over, this book emphasizes the merging of the aforementioned machine perception applications and nonvisual imaging in intensi?ed, near infrared, thermal infrared, laser, polarimetric, and hyperspectral bands.

Spurred by security and safety challenges, research efforts in thermographic sensors have advanced greatly, resulting in better performance in remote surveillance, object recognition, guidance and so on. This comprehensive survey provides a thorough account of the recent deployment of infrared sensors in modern applications of computer vision, as well as in-depth descriptions of the world's best machine vision algorithms and intelligent analytics. The book will help readers understand the motivations, activities, trends and directions of researchers and engineers in the machine-perception field, and offers them a view of the future in this rapidly evolving area. Features:

- Offers an up-to-date and in-depth coverage of theoretical and experimental work in sub-areas of machine perception in infrared, thermal, hyperspectral, intensified and laser imagery
- Highlights new trends and directions in the field of applied machine vision *beyond* the visible spectrum
- Covers applications including homeland security, public transportation, surveillance, medical and military
- Emphasizes the merging of machine perception applications and non-visual imaging in intensified, near infrared, thermal infrared, laser, polarimetric and hyperspectral bands
- Presents advanced techniques for identifying unique infrared signatures and classifying small-resolution objects above and under the soil
- Focuses on describing successful non-contact, thermal video analysis methodologies to compute vital-signs measurements on the human face, neck and breast
- Deals with automatic moving-object detection in airborne, low-resolution near-infrared and thermal videos
- Illustrates fusion and registration techniques of multiple disparate multi-channel visible and thermal sensors for accurate image segmentation
- Discusses multi-target tracking using laser and infrared sensors, as well as augmented human-computer interaction using infrared eye tracking.
- Provides a critical analysis of state-of-the-art techniques in the field of computer vision, including comparison of existing methods and benchmarking

This practical and broad-ranging text offers researchers, advanced students and software engineers alike a thorough understanding of the theory and experimental field-operational characteristics of key algorithmic building blocks of computer vision systems, using non-visual infrared imagery. It contains enough material for a two-semester upper-division or advanced graduate course on topics related to machine vision and its applications. Dr Riad Ibrahim Hammoud is a Senior Research Scientist at Delphi Electronics & Safety and also the successful Springer author of the



106,99 €

99,99 € (zzgl. MwSt.)

Lieferfrist: bis zu 10 Tage

Artikelnummer: 9781447156970

Medium: Buch

ISBN: 978-1-4471-5697-0

Verlag: Springer

Erscheinungstermin: 04.11.2014

Sprache(n): Englisch

Auflage: 2009

Serie: Advances in Computer Vision and Pattern Recognition

Produktform: Kartoniert

Gewicht: 750 g

Seiten: 471

Format (B x H): 155 x 235 mm

