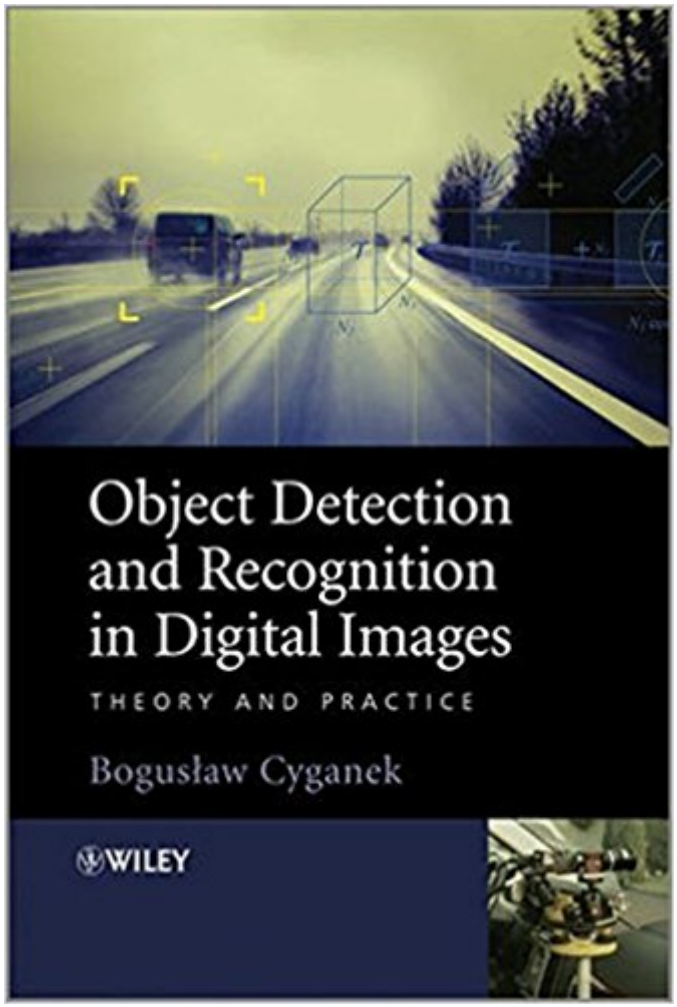
Object Detection And Recognition In Digital Images: Theory And Practice



Synopsis

Object detection, tracking and recognition in images are key problems in computer vision. This book provides the reader with a balanced treatment between the theory and practice of selected methods in these areas to make the book accessible to a range of researchers, engineers, developers and postgraduate students working in computer vision and related fields. Key features: Explains the main theoretical ideas behind each method (which are augmented with a rigorous mathematical derivation of the formulas), their implementation (in C++) and demonstrated working in real applications. Places an emphasis on tensor and statistical based approaches within object detection and recognition. Provides an overview of image clustering and classification methods which includes subspace and kernel based processing, mean shift and Kalman filter, neural networks, and k-means methods. Contains numerous case study examples of mainly automotive applications. Includes a companion website hosting full C++ implementation, of topics presented in the book as a software library, and an accompanying manual to the software platform.

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Customer Reviews

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applications. Places an emphasis on tensor and statistical based approaches within object detection and recognition. Provides an overview of image clustering and classifi cation methods which includes subspace and kernel based processing, mean shift and Kalman fi lter, neural networks, and k-means methods. Contains numerous case study examples of mainly automotive applications. Includes a companion website hosting full C++ implementation, of topics presented in the book as a software library, and an accompanying manual to the software platform. Companion Website: http://www.wiley.com/go/cyganekobject

Boguslaw Cyganek received his M.Sc. degree in electronics in 1993, then in computer science in 1996 from the AGH University of Science and Technology, Krakow, Poland. He obtained his Ph.D. degree cum laude in 2001 with a thesis on correlation of stereo images, and D.Sc. degree in 2011 with a thesis on methods and algorithms of object recognition in digital images. During the recent years, Dr. Boguslaw Cyganek has been cooperating with many scientific centers in development of computer vision systems. He has also gained several years of practical experience working as a Software Development Manager and a Senior Software Engineer both in the USA and Poland. He is currently a researcher and lecturer at the Department of Electronics, AGH University of Science and Technology. His research interests include computer vision, pattern recognition, as well as development of programmable devices and embedded systems. He is an author or a co-author of over eighty conference and journal papers and four books including An Introduction to 3D Computer Vision Techniques and Algorithms published by Wiley. Dr. Cyganek is a member of the IEEE, IAPR and SIAM.

I wanted to learn more about topics like tensor methods. So, for my purposes, Cyganek’s book was really a helpful source of information. The second chapter leads you through a series of important theoretical concepts of tensor methods accompanied by examples of implementations in visual object detection and recognition. Although I was not familiar with the tensor methods, the practical step by step approach applied in this chapter allowed me to get a grasp of the methods and dig deeper into their applications. The third chapter entitled "classification methods an algorithms" again puts a strong emphasis on the method applications in object recognition. So even if you are familiar with me methods themselves it is worth reading for the applicational content. Chapters four and five put the knowledge together and discuss practical implementations in object detection, tracking and recognition. The author built a practical driver assistance system based on the methods, which for instance recognizes road signs and potentially dangerous situations on the road. Particular aspects

of the system are described throughout the book, what is a valuable proof that the algorithms he writes about really work. The book is accompanied by a C++ source code so you can download and run it to see how all the stuff works in practice. All in all the book is surely worth reading.

This is really a valuable book! It contains recent topics in computer vision (like tensors, ensembles of classifiers), as well as the classical ones (like neural networks). The best thing I like about it is that all topics are well explained and all formulas are step by step derived. It also contains a lot of real examples with code.

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