



A Practical Introduction to Computer Vision with OpenCV (Wiley-IS&T Series in Imaging Science and Technology)

By Kenneth Dawson-Howe

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A Practical Introduction to Computer Vision with OpenCV (Wiley-IS&T Series in Imaging Science and Technology) By Kenneth Dawson-Howe

Explains the theory behind basic computer vision and provides a bridge from the theory to practical implementation using the industry standard OpenCV libraries

Computer Vision is a rapidly expanding area and it is becoming progressively easier for developers to make use of this field due to the ready availability of high quality libraries (such as OpenCV 2). This text is intended to facilitate the practical use of computer vision with the goal being to bridge the gap between the theory and the practical implementation of computer vision. The book will explain how to use the relevant OpenCV library routines and will be accompanied by a full working program including the code snippets from the text. This textbook is a heavily illustrated, practical introduction to an exciting field, the applications of which are becoming almost ubiquitous. We are now surrounded by cameras, for example cameras on computers & tablets/ cameras built into our mobile phones/ cameras in games consoles; cameras imaging difficult modalities (such as ultrasound, X-ray, MRI) in hospitals, and surveillance cameras. This book is concerned with helping the next generation of computer developers to make use of all these images in order to develop systems which are more intuitive and interact with us in more intelligent ways.

- Explains the theory behind basic computer vision and provides a bridge from the theory to practical implementation using the industry standard OpenCV libraries
- Offers an introduction to computer vision, with enough theory to make clear how the various algorithms work but with an emphasis on practical programming issues
- Provides enough material for a one semester course in computer vision at senior undergraduate and Masters levels
- Includes the basics of cameras and images and image processing to remove noise, before moving on to topics such as image histogramming; binary imaging; video processing to detect and model moving objects; geometric

operations & camera models; edge detection; features detection; recognition in images

- Contains a large number of vision application problems to provide students with the opportunity to solve real problems. Images or videos for these problems are provided in the resources associated with this book which include an enhanced eBook



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A Practical Introduction to Computer Vision with OpenCV (Wiley-IS&T Series in Imaging Science and Technology) By Kenneth Dawson-Howe Bibliography

- Sales Rank: #1446042 in Books
- Published on: 2014-05-12
- Released on: 2014-05-02
- Original language: English
- Number of items: 1

- Dimensions: 9.65" h x .50" w x 6.70" l, .0 pounds
- Binding: Paperback
- 234 pages

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Editorial Review

Review

“Although there are many computer vision books on the market that offer a more comprehensive approach to explaining the computer vision concepts, extremely few offer such comprehensive practical examples. In this context, the book would be very welcome by beginner code developers.” (*Computing Reviews*, 8 August 2014)

From the Back Cover

Computer Vision is a rapidly expanding area and it is becoming progressively easier for developers to make use of this field due to the ready availability of high quality libraries such as OpenCV3. This book discusses the theory behind basic computer vision and provides a bridge from the theory to practical implementation using the industry standard OpenCV libraries. It explains how to use the relevant OpenCV library routines and is accompanied by a full working program including the code snippets from the text. It is a heavily illustrated, practical introduction to an exciting field, the applications of which are becoming ubiquitous.

Key features:

- Offers an introduction to computer vision, with enough theory to make clear how the various algorithms work but with an emphasis on practical programming issues.
- Explains the basics of cameras and images and image processing to remove noise, before moving on to topics such as image histogramming; binary imaging; video processing to detect and model moving objects; geometric operations & camera models; edge detection; feature detection; and recognition in images.
- Contains a large number of vision application problems to provide students with the opportunity to solve real problems.
- Includes a companion website hosting images and code from the book, as well as application problem videos and images which allow students to attempt to solve the problems presented in the book.

About the Author

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Dr. Dawson-Howe is a Lecturer in the School of Computer Science and Statistics and part of the Graphics, Vision and Visualisation (GV2) Research Group at Trinity College Dublin. He currently teaches the course *Computer Vision/Vision Systems* to final year undergraduate and Masters students. He has been teaching courses in the area of computer vision for over 20 years. He is co-author of the *Dictionary of Computer Vision & Image Processing* published by Wiley in 2005 (2nd Edition to publish December 2013).

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