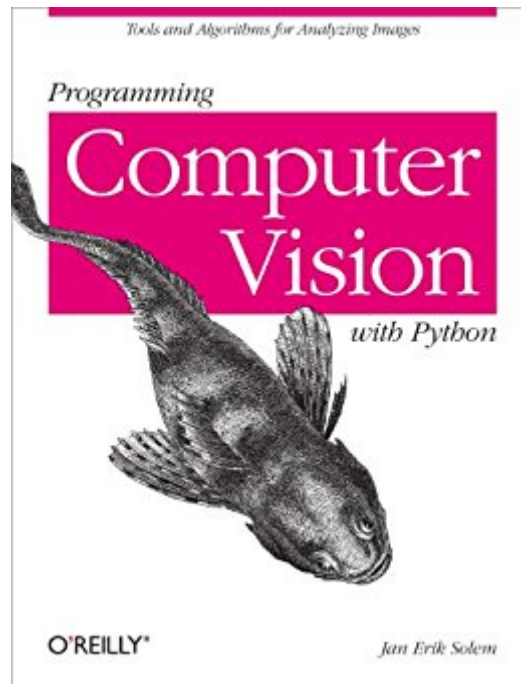# Programming Computer Vision With Python: Tools And Algorithms For Analyzing Images

Synopsis

If you want a basic understanding of computer visionâ™s underlying theory and algorithms, this hands-on introduction is the ideal place to start. Youâ™ll learn techniques for object recognition, 3D reconstruction, stereo imaging, augmented reality, and other computer vision applications as you follow clear examples written in Python.Programming Computer Vision with Python explains computer vision in broad terms that wonâ™t bog you down in theory. You get complete code samples with explanations on how to reproduce and build upon each example, along with exercises to help you apply what youâ™ve learned. This book is ideal for students, researchers, and enthusiasts with basic programming and standard mathematical skills.Learn techniques used in robot navigation, medical image analysis, and other computer vision applicationsWork with image mappings and transforms, such as texture warping and panorama creationCompute 3D reconstructions from several images of the same sceneOrganize images based on similarity or content, using clustering methodsBuild efficient image retrieval techniques to search for images based on visual contentUse algorithms to classify image content and recognize objectsAccess the popular OpenCV library through a Python interface

Book Information

File Size: 8887 KB

Print Length: 274 pages

Page Numbers Source ISBN: 1449316549

Simultaneous Device Usage: Unlimited

Publisher: O'Reilly Media; 1 edition (June 19, 2012)

Publication Date: June 28, 2012

Sold by:Â Digital Services LLC

Language: English

ASIN: B008GCNGVE

Text-to-Speech: Enabled

X-Ray: Not Enabled

Word Wise: Not Enabled

Lending: Not Enabled

Enhanced Typesetting: Not Enabled

Best Sellers Rank: #325,257 Paid in Kindle Store (See Top 100 Paid in Kindle Store)   #70 inÂ Books > Computers & Technology > Computer Science > AI & Machine Learning > Computer

Customer Reviews

*** The Good ***Opening the table of contents, I was immediately impressed by theselection of topics. Computer vision is a broad field, and PCVwP managesto cover plenty of ground. Over the course of few chapters youautomatically create panoramas, build an image search engine, implementan optical sudoku solver, and more. The underlying theory is developedand built upon as you go, so you never have too long of a slog before afun demo. I especially enjoyed how the author capped Chapter 4 on cameramodels - pretty dry stuff, to be honest - with a demonstration ofaugmented reality (placing 3D objects into images) using PyGame and OpenGL.I paid special attention to Chapters 2, "Local Image Descriptors", and7, "Searching Images"; I've implemented these algorithms myself. Bothare presented well. The author covers the theory accurately butsuccinctly, without getting bogged down in detail. The image searchalgorithm presented in the text is simplified but not dumbed down. Infact, the ambitious reader who completes the end-of-chapter exerciseswill have a pretty state of the art image retrieval system.One of the book's strengths is the elegantly written code samples. Theyare a great advertisement for Python as a scientific computing tool. I'mpersonally most at home bit-banging in C++, but even with powerfullibraries (Boost, Eigen, OpenCV) it's hard to match the terseness ofPython. I appreciate the focus on free, open-source software, and thestar libraries in this book - Numpy, SciPy, Matplotlib - arehigh-quality and well documented. MATLAB users, take notice.

I have a background in computer vision and I wanted to learn more about topics like multi-view geometry methods, so, for my purposes, Solem's book was a dream come true. The first five chapters lead you through a series of important mathematical and software tools which make multi-view 3D reconstructions a natural and practical application. I was doing it myself by the end of chapter five. The example code is clear and from the author's website and via github.I had a great time reading the book and going through the programming exercises. I can recommend the book strongly. I just wish I could figure out to whom to recommend it!The practical step by step approach that Solem uses allowed me to dig into the math behind the algorithms while being able to play with working code. This is a great way to learn. So I can imagine that for a college or graduate student, in the right sort of course, the book would be invaluable. It requires a little linear algebra, geometry

and familiarity with vector spaces. I can imagine another audience for this book: the smart, ambitious programmer who wants to use computer vision as part of his or her cool-new-product. The book also covers classifying and searching images using various approaches, along with image segmentation techniques and an introduction to the OpenCV library for speed in a realtime object tracking application.. It even discusses building web applications which make use of these techniques.The book is definitely not a stand-alone textbook; it leaves out a the sort of wider perspective that a course or textbook would provide. This isn't a criticism per se, but I think the book would have benefited from short asides of the sort used in some books which highlight the context and the motivations behind the algorithms.

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