



# Image Processing and Acquisition using Python (Chapman & Hall/CRC Mathematical and Computational Imaging Sciences Series)

By Ravishankar Chityala, Sridevi Pudipeddi

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**Image Processing and Acquisition using Python** provides readers with a sound foundation in both image acquisition and image processing—one of the first books to integrate these topics together. By improving readers' knowledge of image acquisition techniques and corresponding image processing, the book will help them perform experiments more effectively and cost efficiently as well as analyze and measure more accurately. Long recognized as one of the easiest languages for non-programmers to learn, Python is used in a variety of practical examples.

A refresher for more experienced readers, the first part of the book presents an introduction to Python, Python modules, reading and writing images using Python, and an introduction to images. The second part discusses the basics of image processing, including pre/post processing using filters, segmentation, morphological operations, and measurements. The last part describes image acquisition using various modalities, such as x-ray, CT, MRI, light microscopy, and electron microscopy. These modalities encompass most of the common image acquisition methods currently used by researchers in academia and industry.

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- Sales Rank: #759765 in eBooks
- Published on: 2014-02-19
- Released on: 2014-02-19
- Format: Kindle eBook

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## **Editorial Review**

### Review

"This multi-disciplinary image processing guide hits the mark when targeting the introductory college-level user who is interested in an open source solution that is scalable. By approaching the topics in a broad and horizontal fashion, Ravi Chityala and Sridevi Pudipeddi have created a very practical resource that should have broad impact and appeal across multiple physical and biological disciplines while using multiple imaging modalities.

This new book uses an intuitive and efficient structure to describe basic acquisition hand-in-hand with image processing topics using the open source Python coding and even provides pre-packed installations. The authors present an effective approach to address the typical requirement of prerequisite image acquisition, computational knowledge, and/or hardware requirements by carefully balancing programming, math, and computer requirements, making image processing accessible to students and high-end users alike in multiple disciplines."

?Mark A. Sanders, Program Director, University Imaging Centers, University of Minnesota

"This is a well-suited companion for any introductory course on image processing. The concepts are clearly explained and well illustrated through examples and Python code provided to the reader. The code allows the reader to readily apply the concepts to any images at hand, which significantly simplifies the understanding of image processing concepts. This is what makes this book great. I recommend this book to researchers and students who are looking for an introduction to image processing and acquisition."

?Martin Styner, University of North Carolina at Chapel Hill

"I am a faculty member with specialization in biomechanics and have often found it hard to conceptualize the fundamentals of image processing. That is until I found this book. **Image Processing and Acquisition using Python** is unique in that it offers an in-depth understanding of the foundation of mathematics associated with image analysis. Ravi Chityala and Sridevi Pudipeddi provide accessible examples with sample codes to show how the theories are applied. This can be very useful to beginning learners and also for researchers (having Python sample code can be very handy to prototype a solution). This book touches all the fundamental topics on image processing, such as pre/post processing using filters, segmentation, morphological operations, and measurements, and also an in-depth discussion on image acquisition using various modalities like x-ray, CT, MRI, light microscopy, and electron microscopy. All the topics are explained clearly and easily. I would highly recommend this book and cannot praise enough the logical and well-written format that it is presented in."

?Augusto Gil Pascoal, Laboratory of Biomechanics and Functional Morphology, University of Lisbon

"This is a book that every imaging scientist should have on his or her desk ... students and researchers need a course or a book to learn both image acquisition and image processing using a single source, and this book, as a well-rounded introduction to both topics, serves that purpose very well. ... the authors have done a great job of covering the most commonly used image acquisition modalities ... a handy compendium of the most useful information. ... As a long-time Perl user, I had no problem installing Python and trying several useful examples from the book."

?From the Foreword by Alexander Zamyatin, Distinguished Scientist, Toshiba Medical Research Institute USA, Inc.

## About the Author

I am currently working at the Minnesota Supercomputing Institute, University of Minnesota, Twin Cities campus. My primary interests are in various aspects of Image processing like Medical and Microscopy Imaging. I am also interested in the extraction of text from images. You can visit my home page at [chityala.org/](http://chityala.org/)

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**Christi Shoup:**

In this period of time globalization it is important to someone to obtain information. The information will make anyone to understand the condition of the world. The condition of the world makes the information easier to share. You can find a lot of sources to get information example: internet, classifieds, book, and soon. You can see that now, a lot of publisher in which print many kinds of book. The book that recommended to you is Image Processing and Acquisition using Python (Chapman & Hall/CRC Mathematical and Computational Imaging Sciences Series) this publication consist a lot of the information on the condition of this world now. This particular book was represented how can the world has grown up. The terminology styles that writer use for explain it is easy to understand. The actual writer made some research when he makes this book. Here is why this book suited all of you.

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