

Practical Python And Opencv By Adrian Rosebrock

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[Deep Learning with PyTorch](#) - Luca Pietro
Giovanni Antiga 2020-07-01
“We finally have the definitive treatise on PyTorch! It covers the basics and abstractions in great detail. I hope this book becomes your extended reference document.” —Soumith

Chintala, co-creator of PyTorch Key Features
Written by PyTorch’s creator and key contributors Develop deep learning models in a familiar Pythonic way Use PyTorch to build an image classifier for cancer detection Diagnose problems with your neural network and improve

training with data augmentation Purchase of the print book includes a free eBook in PDF, Kindle, and ePub formats from Manning Publications. About The Book Every other day we hear about new ways to put deep learning to good use: improved medical imaging, accurate credit card fraud detection, long range weather forecasting, and more. PyTorch puts these superpowers in your hands. Instantly familiar to anyone who knows Python data tools like NumPy and Scikit-learn, PyTorch simplifies deep learning without sacrificing advanced features. It's great for building quick models, and it scales smoothly from laptop to enterprise. Deep Learning with PyTorch teaches you to create deep learning and neural network systems with PyTorch. This practical book gets you to work right away building a tumor image classifier from scratch. After covering the basics, you'll learn best practices for the entire deep learning pipeline, tackling advanced projects as your PyTorch skills become more sophisticated. All code

samples are easy to explore in downloadable Jupyter notebooks. What You Will Learn Understanding deep learning data structures such as tensors and neural networks Best practices for the PyTorch Tensor API, loading data in Python, and visualizing results Implementing modules and loss functions Utilizing pretrained models from PyTorch Hub Methods for training networks with limited inputs Sifting through unreliable results to diagnose and fix problems in your neural network Improve your results with augmented data, better model architecture, and fine tuning This Book Is Written For For Python programmers with an interest in machine learning. No experience with PyTorch or other deep learning frameworks is required. About The Authors Eli Stevens has worked in Silicon Valley for the past 15 years as a software engineer, and the past 7 years as Chief Technical Officer of a startup making medical device software. Luca Antiga is co-founder and

CEO of an AI engineering company located in Bergamo, Italy, and a regular contributor to PyTorch. Thomas Viehmann is a Machine Learning and PyTorch speciality trainer and consultant based in Munich, Germany and a PyTorch core developer. Table of Contents PART 1 - CORE PYTORCH 1 Introducing deep learning and the PyTorch Library 2 Pretrained networks 3 It starts with a tensor 4 Real-world data representation using tensors 5 The mechanics of learning 6 Using a neural network to fit the data 7 Telling birds from airplanes: Learning from images 8 Using convolutions to generalize PART 2 - LEARNING FROM IMAGES IN THE REAL WORLD: EARLY DETECTION OF LUNG CANCER 9 Using PyTorch to fight cancer 10 Combining data sources into a unified dataset 11 Training a classification model to detect suspected tumors 12 Improving training with metrics and augmentation 13 Using segmentation to find suspected nodules 14 End-to-end nodule analysis, and where to go next

PART 3 - DEPLOYMENT 15 Deploying to production

Beginning Robotics with Raspberry Pi and Arduino - Jeff Cicolani 2018-04-23

Learn how to use a Raspberry Pi in conjunction with an Arduino to build a basic robot with advanced capabilities. Getting started in robotics does not have to be difficult. This book is an insightful and rewarding introduction to robotics and a catalyst for further directed study. You'll be led step by step through the process of building a robot that uses the power of a Linux based computer paired with the simplicity of Arduino. You'll learn why the Raspberry Pi is a great choice for a robotics platform; its strengths as well as its shortcomings; how to overcome these limitations by implementing an Arduino; and the basics of the Python programming language as well as some of the more powerful features. With the Raspberry Pi you can give your project the power of a Linux computer, while Arduino makes interacting with

sensors and motors very easy. These two boards are complimentary in their functions; where one falters the other performs admirably. The book also includes references to other great works to help further your growth in the exciting, and now accessible, field of smart robotics. As a bonus, the final chapter of the book demonstrates the real power of the Raspberry Pi by implementing a basic vision system. Using OpenCV and a standard USB web cam, you will build a robot that can chase a ball. What You'll Learn Install Raspbian, the operating system that drives the Raspberry Pi Drive motors through an I2C motor controller Read data through sensors attached to an Arduino Who This Book Is For Hobbyists and students looking for a rapid start in robotics. It assumes no technical background. Readers are guided to pursue the areas that interest them in more detail as they learn.

[Deep Learning in Medical Image Analysis](#) -
Gobert Lee 2020-02-06

This book presents cutting-edge research and applications of deep learning in a broad range of medical imaging scenarios, such as computer-aided diagnosis, image segmentation, tissue recognition and classification, and other areas of medical and healthcare problems. Each of its chapters covers a topic in depth, ranging from medical image synthesis and techniques for musculoskeletal analysis to diagnostic tools for breast lesions on digital mammograms and glaucoma on retinal fundus images. It also provides an overview of deep learning in medical image analysis and highlights issues and challenges encountered by researchers and clinicians, surveying and discussing practical approaches in general and in the context of specific problems. Academics, clinical and industry researchers, as well as young researchers and graduate students in medical imaging, computer-aided-diagnosis, biomedical engineering and computer vision will find this book a great reference and very useful learning

resource.

Practical Python Design Patterns - Wessel Badenhorst 2017-10-17

Become a better, more productive programmer through a series of projects that will help you deeply understand and master each of the design patterns covered. In this book you will learn to write elegant "Pythonic" code to solve common programming problems. You will also experience design thinking, by identifying design patterns that would be helpful given a specific problem or situation. Python is eating the world. In recent years it has become so much more than a mere object-oriented, scripting language. Design patterns help you think of and solve problems in chunks. They help you to stand on the shoulders of the giants who have come before, instead of having to reinvent the wheel. What You Will Learn Craft cleaner code Increase your effectiveness as a programmer Write more Pythonic code Solve bigger problems Discover optimal solutions to common problems, done in a

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way that is uniquely Pythonic Who This Book Is For Programmers who are comfortable with Python. It is also guide for people who have mastered other programming languages and who want to make the transition to Python.

Practical Natural Language Processing - Sowmya Vajjala 2020-06-17

Many books and courses tackle natural language processing (NLP) problems with toy use cases and well-defined datasets. But if you want to build, iterate, and scale NLP systems in a business setting and tailor them for particular industry verticals, this is your guide. Software engineers and data scientists will learn how to navigate the maze of options available at each step of the journey. Through the course of the book, authors Sowmya Vajjala, Bodhisattwa Majumder, Anuj Gupta, and Harshit Surana will guide you through the process of building real-world NLP solutions embedded in larger product setups. You'll learn how to adapt your solutions for different industry verticals such as

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healthcare, social media, and retail. With this book, you'll: Understand the wide spectrum of problem statements, tasks, and solution approaches within NLP Implement and evaluate different NLP applications using machine learning and deep learning methods Fine-tune your NLP solution based on your business problem and industry vertical Evaluate various algorithms and approaches for NLP product tasks, datasets, and stages Produce software solutions following best practices around release, deployment, and DevOps for NLP systems Understand best practices, opportunities, and the roadmap for NLP from a business and product leader's perspective

Hands-On Image Processing with Python -

Sandipan Dey 2018-11-30

Explore the mathematical computations and algorithms for image processing using popular Python tools and frameworks. Key Features Practical coverage of every image processing task with popular Python

libraries Includes topics such as pseudo-coloring, noise smoothing, computing image descriptors Covers popular machine learning and deep learning techniques for complex image processing tasks Book Description Image processing plays an important role in our daily lives with various applications such as in social media (face detection), medical imaging (X-ray, CT-scan), security (fingerprint recognition) to robotics & space. This book will touch the core of image processing, from concepts to code using Python. The book will start from the classical image processing techniques and explore the evolution of image processing algorithms up to the recent advances in image processing or computer vision with deep learning. We will learn how to use image processing libraries such as PIL, scikit-mage, and scipy ndimage in Python. This book will enable us to write code snippets in Python 3 and quickly implement complex image processing algorithms such as image enhancement,

filtering, segmentation, object detection, and classification. We will be able to use machine learning models using the scikit-learn library and later explore deep CNN, such as VGG-19 with Keras, and we will also use an end-to-end deep learning model called YOLO for object detection. We will also cover a few advanced problems, such as image inpainting, gradient blending, variational denoising, seam carving, quilting, and morphing. By the end of this book, we will have learned to implement various algorithms for efficient image processing. What you will learn

Perform basic data pre-processing tasks such as image denoising and spatial filtering in Python

Implement Fast Fourier Transform (FFT) and Frequency domain filters (e.g., Weiner) in Python

Do morphological image processing and segment images with different algorithms

Learn techniques to extract features from images and match images

Write Python code to implement supervised / unsupervised machine learning algorithms for image

processing

Use deep learning models for image classification, segmentation, object detection and style transfer

Who this book is for

This book is for Computer Vision Engineers, and machine learning developers who are good with Python programming and want to explore details and complexities of image processing. No prior knowledge of the image processing techniques is expected.

Bulleh Shah - 2016-01-14

This book is a collection of poems by the great Sufi poet of Punjab, Bulleh Shah (1680-1758), translated into English by Taufiq Rafat, one of Pakistan's premier English language poets. Born Abdullah Shah, Bulleh Shah belonged to the oral tradition and his poems are primarily in Punjabi as well as in Siraiki. Bulleh Shah's poetry is in the Kafi style, already established with the Sufis who preceded him, and extensively use the Rubbay (quatrain) form. Several of his verses are an integral part of the traditional repertoire of Qawwali, the musical genre which represents

the devotional music of the Sufis. Following the tradition of Sufi poetry, the poems in this collection refer to love of or for God, or the Mentor, or the desire for absorption in nature, described through symbolic references to local customs pertaining to weddings, funerals, journeys, and harvests.

The Pig - Richard Lutwyche 2019-10-01

A comprehensive, richly illustrated introduction to the fascinating natural history of the pig, from prehistory to the present. At any given time, there are around one billion pigs in the world; that's one for every seven of us. And where would we be without them? Prolific, ubiquitous, smart, adaptable, and providers of high-quality protein, pigs have been our companions since neolithic times, when they obligingly domesticated themselves, coming in from the wild to root around our waste pits. But it's not all about the bacon; today, bred in micro sizes, the resourceful pig has developed a whole new career as a popular pet. And thanks to genome

mapping, we now know that the pig shares many common physiological features with humans, spurring the use of pig tissue and organs in medical research and surgery. Beautifully designed and illustrated, *The Pig* provides a snout-to-tail natural history of this important species, from the prehistoric "hell pig" to today's placid porker, covering the pig's evolution and domestication, anatomy and biology, behavior, role in human life and culture, and breeds. The book also features an engrossing and visually stunning photographic gallery of some thirty popular breeds from around the world, with essential information about each. Filled with surprising facts and insights, *The Pig* will delight anyone who loves these animals and wants to understand them better. Provides a comprehensive, richly illustrated introduction to the pig's evolution and domestication, anatomy and biology, behavior, role in human life and culture, and breeds. Features infographics, diagrams, and 250 stunning color photographs

Includes a beautiful photographic directory to some 30 popular breeds from around the world, with essential information about each

Learning OpenCV 3 - Adrian Kaehler

2016-12-14

"This book provides a working guide to the C++ Open Source Computer Vision Library (OpenCV) version 3.x and gives a general background on the field of computer vision sufficient to help readers use OpenCV effectively."--Preface.

Computer Vision with SAS - Susan Kahler

2020-07-22

Computer vision is a field of artificial intelligence that trains computers to interpret and understand the visual world. In recent years, computer vision has begun to rival and even surpass human visual abilities in many areas. SAS offers many different solutions to train computers to "see" by identifying and classifying objects, and several groundbreaking papers have been written to demonstrate these techniques. The papers included in this special

collection demonstrate how the latest computer vision tools and techniques can be used to solve a variety of business problems.

Machine Learning with the Raspberry Pi -

Donald J. Norris 2019-11-29

Using the Pi Camera and a Raspberry Pi board, expand and replicate interesting machine learning (ML) experiments. This book provides a solid overview of ML and a myriad of underlying topics to further explore. Non-technical discussions temper complex technical explanations to make the hottest and most complex topic in the hobbyist world of computing understandable and approachable. Machine learning, also commonly referred to as deep learning (DL), is currently being integrated into a multitude of commercial products as well as widely being used in industrial, medical, and military applications. It is hard to find any modern human activity, which has not been "touched" by artificial intelligence (AI) applications. Building on the concepts first

presented in *Beginning Artificial Intelligence with the Raspberry Pi*, you'll go beyond simply understanding the concepts of AI into working with real machine learning experiments and applying practical deep learning concepts to experiments with the Pi board and computer vision. What you learn with *Machine Learning with the Raspberry Pi* can then be moved on to other platforms to go even further in the world of AI and ML to better your hobbyist or commercial projects. What You'll Learn Acquire a working knowledge of current ML Use the Raspberry Pi to implement ML techniques and algorithms Apply AI and ML tools and techniques to your own work projects and studies Who This Book Is For Engineers and scientists but also experienced makers and hobbyists. Motivated high school students who desire to learn about ML can benefit from this material with determination.

Computer Vision - Simon J. D. Prince 2012-06-18
A modern treatment focusing on learning and

inference, with minimal prerequisites, real-world examples and implementable algorithms.

Serious Python - Julien Danjou 2018-12-31
An indispensable collection of practical tips and real-world advice for tackling common Python problems and taking your code to the next level. Features interviews with high-profile Python developers who share their tips, tricks, best practices, and real-world advice gleaned from years of experience. Sharpen your Python skills as you dive deep into the Python programming language with *Serious Python*. You'll cover a range of advanced topics like multithreading and memorization, get advice from experts on things like designing APIs and dealing with databases, and learn Python internals to help you gain a deeper understanding of the language itself. Written for developers and experienced programmers, *Serious Python* brings together over 15 years of Python experience to teach you how to avoid common mistakes, write code more efficiently, and build better programs in less

time. As you make your way through the book's extensive tutorials, you'll learn how to start a project and tackle topics like versioning, layouts, coding style, and automated checks. You'll learn how to package your software for distribution, optimize performance, use the right data structures, define functions efficiently, pick the right libraries, build future-proof programs, and optimize your programs down to the bytecode. You'll also learn how to: - Make and use effective decorators and methods, including abstract, static, and class methods - Employ Python for functional programming using generators, pure functions, and functional functions - Extend flake8 to work with the abstract syntax tree (AST) to introduce more sophisticated automatic checks into your programs - Apply dynamic performance analysis to identify bottlenecks in your code - Work with relational databases and effectively manage and stream data with PostgreSQL If you've been looking for a way to take your Python skills from good to great,

Serious Python will help you get there. Learn from the experts and get seriously good at Python with Serious Python!

Mastering Machine Learning with Python in Six Steps - Manohar Swamynathan 2019-10-01

Explore fundamental to advanced Python 3 topics in six steps, all designed to make you a worthy practitioner. This updated version's approach is based on the "six degrees of separation" theory, which states that everyone and everything is a maximum of six steps away and presents each topic in two parts: theoretical concepts and practical implementation using suitable Python 3 packages. You'll start with the fundamentals of Python 3 programming language, machine learning history, evolution, and the system development frameworks. Key data mining/analysis concepts, such as exploratory analysis, feature dimension reduction, regressions, time series forecasting and their efficient implementation in Scikit-learn are covered as well. You'll also learn commonly

used model diagnostic and tuning techniques. These include optimal probability cutoff point for class creation, variance, bias, bagging, boosting, ensemble voting, grid search, random search, Bayesian optimization, and the noise reduction technique for IoT data. Finally, you'll review advanced text mining techniques, recommender systems, neural networks, deep learning, reinforcement learning techniques and their implementation. All the code presented in the book will be available in the form of iPython notebooks to enable you to try out these examples and extend them to your advantage. What You'll Learn Understand machine learning development and frameworks Assess model diagnosis and tuning in machine learning Examine text mining, natural language processing (NLP), and recommender systems Review reinforcement learning and CNN Who This Book Is For Python developers, data engineers, and machine learning engineers looking to expand their knowledge or career into

machine learning area.

Python Deep Learning - Valentino Zocca
2017-04-28

Take your machine learning skills to the next level by mastering Deep Learning concepts and algorithms using Python. About This Book Explore and create intelligent systems using cutting-edge deep learning techniques Implement deep learning algorithms and work with revolutionary libraries in Python Get real-world examples and easy-to-follow tutorials on Theano, TensorFlow, H2O and more Who This Book Is For This book is for Data Science practitioners as well as aspirants who have a basic foundational understanding of Machine Learning concepts and some programming experience with Python. A mathematical background with a conceptual understanding of calculus and statistics is also desired. What You Will Learn Get a practical deep dive into deep learning algorithms Explore deep learning further with Theano, Caffe, Keras, and

TensorFlow Learn about two of the most powerful techniques at the core of many practical deep learning implementations: Auto-Encoders and Restricted Boltzmann Machines Dive into Deep Belief Nets and Deep Neural Networks Discover more deep learning algorithms with Dropout and Convolutional Neural Networks Get to know device strategies so you can use deep learning algorithms and libraries in the real world In Detail With an increasing interest in AI around the world, deep learning has attracted a great deal of public attention. Every day, deep learning algorithms are used broadly across different industries. The book will give you all the practical information available on the subject, including the best practices, using real-world use cases. You will learn to recognize and extract information to increase predictive accuracy and optimize results. Starting with a quick recap of important machine learning concepts, the book will delve straight into deep learning principles using Sci-

kit learn. Moving ahead, you will learn to use the latest open source libraries such as Theano, Keras, Google's TensorFlow, and H2O. Use this guide to uncover the difficulties of pattern recognition, scaling data with greater accuracy and discussing deep learning algorithms and techniques. Whether you want to dive deeper into Deep Learning, or want to investigate how to get more out of this powerful technology, you'll find everything inside. Style and approach Python Machine Learning by example follows practical hands on approach. It walks you through the key elements of Python and its powerful machine learning libraries with the help of real world projects.

The HELP Guide for Community Based Rehabilitation Workers - Marian Loveday
2006-01-01

Robust Computer Vision - N. Sebe 2013-06-29
From the foreword by Thomas Huang: "During the past decade, researchers in computer vision

have found that probabilistic machine learning methods are extremely powerful. This book describes some of these methods. In addition to the Maximum Likelihood framework, Bayesian Networks, and Hidden Markov models are also used. Three aspects are stressed: features, similarity metric, and models. Many interesting and important new results, based on research by the authors and their collaborators, are presented. Although this book contains many new results, it is written in a style that suits both experts and novices in computer vision."

Practical Machine Learning and Image Processing - Himanshu Singh 2019-02-26

Gain insights into image-processing methodologies and algorithms, using machine learning and neural networks in Python. This book begins with the environment setup, understanding basic image-processing terminology, and exploring Python concepts that will be useful for implementing the algorithms discussed in the book. You will then cover all the

core image processing algorithms in detail before moving onto the biggest computer vision library: OpenCV. You'll see the OpenCV algorithms and how to use them for image processing. The next section looks at advanced machine learning and deep learning methods for image processing and classification. You'll work with concepts such as pulse coupled neural networks, AdaBoost, XG boost, and convolutional neural networks for image-specific applications. Later you'll explore how models are made in real time and then deployed using various DevOps tools. All the concepts in Practical Machine Learning and Image Processing are explained using real-life scenarios. After reading this book you will be able to apply image processing techniques and make machine learning models for customized application. What You Will Learn Discover image-processing algorithms and their applications using Python Explore image processing using the OpenCV library Use TensorFlow, scikit-learn, NumPy, and other

libraries Work with machine learning and deep learning algorithms for image processing Apply image-processing techniques to five real-time projects Who This Book Is For Data scientists and software developers interested in image processing and computer vision.

TensorFlow Deep Learning Projects - Alexey Grigorev 2018-03-28

Leverage the power of Tensorflow to design deep learning systems for a variety of real-world scenarios Key Features Build efficient deep learning pipelines using the popular Tensorflow framework Train neural networks such as ConvNets, generative models, and LSTMs Includes projects related to Computer Vision, stock prediction, chatbots and more Book Description TensorFlow is one of the most popular frameworks used for machine learning and, more recently, deep learning. It provides a fast and efficient framework for training different kinds of deep learning models, with very high accuracy. This book is your guide to

master deep learning with TensorFlow with the help of 10 real-world projects. TensorFlow Deep Learning Projects starts with setting up the right TensorFlow environment for deep learning. Learn to train different types of deep learning models using TensorFlow, including Convolutional Neural Networks, Recurrent Neural Networks, LSTMs, and Generative Adversarial Networks. While doing so, you will build end-to-end deep learning solutions to tackle different real-world problems in image processing, recommendation systems, stock prediction, and building chatbots, to name a few. You will also develop systems that perform machine translation, and use reinforcement learning techniques to play games. By the end of this book, you will have mastered all the concepts of deep learning and their implementation with TensorFlow, and will be able to build and train your own deep learning models with TensorFlow confidently. What you will learn Set up the TensorFlow environment

for deep learning Construct your own ConvNets for effective image processing Use LSTMs for image caption generation Forecast stock prediction accurately with an LSTM architecture Learn what semantic matching is by detecting duplicate Quora questions Set up an AWS instance with TensorFlow to train GANs Train and set up a chatbot to understand and interpret human input Build an AI capable of playing a video game by itself -and win it! Who this book is for This book is for data scientists, machine learning developers as well as deep learning practitioners, who want to build interesting deep learning projects that leverage the power of Tensorflow. Some understanding of machine learning and deep learning, and familiarity with the TensorFlow framework is all you need to get started with this book.

OpenCV for Secret Agents - Joseph Howse

2015-01-28

This book is for programmers who want to expand their skills by building fun, smart, and

useful systems with OpenCV. The projects are ideal in helping you to think creatively about the uses of computer vision, natural user interfaces, and ubiquitous computers (in your home, car, and hand).

Mastering OpenCV with Practical Computer Vision Projects - Daniel Lélis Baggio 2012-12-03

Each chapter in the book is an individual project and each project is constructed with step-by-step instructions, clearly explained code, and includes the necessary screenshots. You should have basic OpenCV and C/C++ programming experience before reading this book, as it is aimed at Computer Science graduates, researchers, and computer vision experts widening their expertise.

TensorFlow for Machine Intelligence - Sam Abrahams 2016

Computer Vision in Medical Imaging - C H Chen 2013-11-18

The major progress in computer vision allows us

to make extensive use of medical imaging data to provide us better diagnosis, treatment and predication of diseases. Computer vision can exploit texture, shape, contour and prior knowledge along with contextual information from image sequence and provide 3D and 4D information that helps with better human understanding. Many powerful tools have been available through image segmentation, machine learning, pattern classification, tracking, reconstruction to bring much needed quantitative information not easily available by trained human specialists. The aim of the book is for both medical imaging professionals to acquire and interpret the data, and computer vision professionals to provide enhanced medical information by using computer vision techniques. The final objective is to benefit the patients without adding to the already high medical costs. Contents:An Introduction to Computer Vision in Medical Imaging (Chi Hau Chen)Theory and Methodologies:Distribution

Matching Approaches to Medical Image Segmentation (Ismail Ben Ayed)Digital Pathology in Medical Imaging (Bikash Sabata, Chukka Srinivas, Pascal Bamford and Gerardo Fernandez)Adaptive Shape Prior Modeling via Online Dictionary Learning (Shaoting Zhang, Yiqiang Zhan, Yan Zhou and Dimitris Metaxas)Feature-Centric Lesion Detection and Retrieval in Thoracic Images (Yang Song, Weidong Cai, Stefan Eberl, Michael J Fulham and David Dagan Feng)A Novel Paradigm for Quantitation from MR Phase (Joseph Dagher)A Multi-Resolution Active Contour Framework for Ultrasound Image Segmentation (Weiming Wang, Jing Qin, Pheng-Ann Heng, Yim-Pan Chui, Liang Li and Bing Nan Li)2D, 3D Reconstructions/Imaging Algorithms, Systems & Sensor Fusion:Model-Based Image Reconstruction in Optoacoustic Tomography (Amir Rosenthal, Daniel Razansky and Vasilis Ntziachristos)The Fusion of Three-Dimensional Quantitative Coronary Angiography and

Intracoronary Imaging for Coronary Interventions (Shengxian Tu, Niels R Holm, Johannes P Janssen and Johan H C Reiber) Three-Dimensional Reconstruction Methods in Near-Field Coded Aperture for SPECT Imaging System (Stephen Baoming Hong) Ultrasound Volume Reconstruction based on Direct Frame Interpolation (Sergei Koptenko, Rachel Remlinger, Martin Lachaine, Tony Falco and Ulrich Scheipers) Deconvolution Technique for Enhancing and Classifying the Retinal Images (Uvais A Qidwai and Umair A Qidwai) Medical Ultrasound Digital Signal Processing in the GPU Computing Era (Marcin Lewandowski) Developing Medical Image Processing Algorithms for GPU Assisted Parallel Computation (Mathias Broxvall and Marios Daotis) Specific Image Processing and Computer Vision Methods for Different Imaging Modalities Including IVUS, MRI, etc.: Computer Vision in Interventional Cardiology (Kendall R Waters) Pattern Classification of Brain Diffusion

MRI: Application to Schizophrenia Diagnosis (Ali Tabesh, Matthew J Hoptman, Debra D'Angelo and Babak A Ardekani) On Compressed Sensing Reconstruction for Magnetic Resonance Imaging (Benjamin Paul Berman, Sagar Mandava and Ali Bilgin) On Hierarchical Statistical Shape Models with Application to Brain MRI (Juan J Cerrolaza, Arantxa Villanueva and Rafael Cabeza) Advanced PDE-based Methods for Automatic Quantification of Cardiac Function and Scar from Magnetic Resonance Imaging (Durco Turco and Cristiana Corsi) Automated IVUS Segmentation Using Deformable Template Model with Feature Tracking (Prakash Manandhar and Chi Hau Chen) Readership: Researchers, professionals and academics in machine perception/computer vision, pattern recognition/image analysis, nuclear medicine, bioengineering & cardiology. Keywords: Medical Imaging; Computer Vision; Image Segmentation; Machine Learning; 3D Information Key Features: Uses computer vision

techniques for medical imaging data
Covers image processing and segmentation algorithms in intravascular ultrasound, PETscan data, MRI data
Emphasises 3D information extraction from medical imaging data

Deep Learning with Python - Francois Chollet
2017-11-30

Summary Deep Learning with Python introduces the field of deep learning using the Python language and the powerful Keras library.

Written by Keras creator and Google AI researcher François Chollet, this book builds your understanding through intuitive explanations and practical examples. Purchase of the print book includes a free eBook in PDF, Kindle, and ePub formats from Manning Publications. About the Technology Machine learning has made remarkable progress in recent years. We went from near-unusable speech and image recognition, to near-human accuracy. We went from machines that couldn't beat a serious Go player, to defeating a world

champion. Behind this progress is deep learning—a combination of engineering advances, best practices, and theory that enables a wealth of previously impossible smart applications. About the Book Deep Learning with Python introduces the field of deep learning using the Python language and the powerful Keras library. Written by Keras creator and Google AI researcher François Chollet, this book builds your understanding through intuitive explanations and practical examples. You'll explore challenging concepts and practice with applications in computer vision, natural-language processing, and generative models. By the time you finish, you'll have the knowledge and hands-on skills to apply deep learning in your own projects. What's Inside Deep learning from first principles Setting up your own deep-learning environment Image-classification models Deep learning for text and sequences Neural style transfer, text generation, and image generation About the Reader Readers need

intermediate Python skills. No previous experience with Keras, TensorFlow, or machine learning is required. About the Author François Chollet works on deep learning at Google in Mountain View, CA. He is the creator of the Keras deep-learning library, as well as a contributor to the TensorFlow machine-learning framework. He also does deep-learning research, with a focus on computer vision and the application of machine learning to formal reasoning. His papers have been published at major conferences in the field, including the Conference on Computer Vision and Pattern Recognition (CVPR), the Conference and Workshop on Neural Information Processing Systems (NIPS), the International Conference on Learning Representations (ICLR), and others. Table of Contents PART 1 - FUNDAMENTALS OF DEEP LEARNING What is deep learning? Before we begin: the mathematical building blocks of neural networks Getting started with neural networks Fundamentals of machine

learning PART 2 - DEEP LEARNING IN PRACTICE Deep learning for computer vision Deep learning for text and sequences Advanced deep-learning best practices Generative deep learning Conclusions appendix A - Installing Keras and its dependencies on Ubuntu appendix B - Running Jupyter notebooks on an EC2 GPU instance

Learning OpenCV 4 Computer Vision with Python 3 - Joseph Howse 2020-02-20

Updated for OpenCV 4 and Python 3, this book covers the latest on depth cameras, 3D tracking, augmented reality, and deep neural networks, helping you solve real-world computer vision problems with practical code Key Features Build powerful computer vision applications in concise code with OpenCV 4 and Python 3 Learn the fundamental concepts of image processing, object classification, and 2D and 3D tracking Train, use, and understand machine learning models such as Support Vector Machines (SVMs) and neural networks Book Description Computer

vision is a rapidly evolving science, encompassing diverse applications and techniques. This book will not only help those who are getting started with computer vision but also experts in the domain. You'll be able to put theory into practice by building apps with OpenCV 4 and Python 3. You'll start by understanding OpenCV 4 and how to set it up with Python 3 on various platforms. Next, you'll learn how to perform basic operations such as reading, writing, manipulating, and displaying still images, videos, and camera feeds. From taking you through image processing, video analysis, and depth estimation and segmentation, to helping you gain practice by building a GUI app, this book ensures you'll have opportunities for hands-on activities. Next, you'll tackle two popular challenges: face detection and face recognition. You'll also learn about object classification and machine learning concepts, which will enable you to create and use object detectors and classifiers, and even

track objects in movies or video camera feed. Later, you'll develop your skills in 3D tracking and augmented reality. Finally, you'll cover ANNs and DNNs, learning how to develop apps for recognizing handwritten digits and classifying a person's gender and age. By the end of this book, you'll have the skills you need to execute real-world computer vision projects. What you will learn
Install and familiarize yourself with OpenCV 4's Python 3 bindings
Understand image processing and video analysis basics
Use a depth camera to distinguish foreground and background regions
Detect and identify objects, and track their motion in videos
Train and use your own models to match images and classify objects
Detect and recognize faces, and classify their gender and age
Build an augmented reality application to track an image in 3D
Work with machine learning models, including SVMs, artificial neural networks (ANNs), and deep neural networks (DNNs)
Who this book is for
If you are interested in learning

computer vision, machine learning, and OpenCV in the context of practical real-world applications, then this book is for you. This OpenCV book will also be useful for anyone getting started with computer vision as well as experts who want to stay up-to-date with OpenCV 4 and Python 3. Although no prior knowledge of image processing, computer vision or machine learning is required, familiarity with basic Python programming is a must.

Learning OpenCV 3 Application

Development - Samyak Datta 2016-12-19

Build, create, and deploy your own computer vision applications with the power of OpenCV
About This Book This book provides hands-on examples that cover the major features that are part of any important Computer Vision application It explores important algorithms that allow you to recognize faces, identify objects, extract features from images, help your system make meaningful predictions from visual data, and much more All the code examples in the

book are based on OpenCV 3.1 - the latest version Who This Book Is For This is the perfect book for anyone who wants to dive into the exciting world of image processing and computer vision. This book is aimed at programmers with a working knowledge of C++. Prior knowledge of OpenCV or Computer Vision/Machine Learning is not required. What You Will Learn Explore the steps involved in building a typical computer vision/machine learning application Understand the relevance of OpenCV at every stage of building an application Harness the vast amount of information that lies hidden in images into the apps you build Incorporate visual information in your apps to create more appealing software Get acquainted with how large-scale and popular image editing apps such as Instagram work behind the scenes by getting a glimpse of how the image filters in apps can be recreated using simple operations in OpenCV Appreciate how difficult it is for a computer program to perform tasks that are

trivial for human beings Get to know how to develop applications that perform face detection, gender detection from facial images, and handwritten character (digit) recognition In Detail Computer vision and machine learning concepts are frequently used in practical computer vision based projects. If you're a novice, this book provides the steps to build and deploy an end-to-end application in the domain of computer vision using OpenCV/C++. At the outset, we explain how to install OpenCV and demonstrate how to run some simple programs. You will start with images (the building blocks of image processing applications), and see how they are stored and processed by OpenCV. You'll get comfortable with OpenCV-specific jargon (Mat Point, Scalar, and more), and get to know how to traverse images and perform basic pixel-wise operations. Building upon this, we introduce slightly more advanced image processing concepts such as filtering, thresholding, and edge detection. In the latter

parts, the book touches upon more complex and ubiquitous concepts such as face detection (using Haar cascade classifiers), interest point detection algorithms, and feature descriptors. You will now begin to appreciate the true power of the library in how it reduces mathematically non-trivial algorithms to a single line of code! The concluding sections touch upon OpenCV's Machine Learning module. You will witness not only how OpenCV helps you pre-process and extract features from images that are relevant to the problems you are trying to solve, but also how to use Machine Learning algorithms that work on these features to make intelligent predictions from visual data! Style and approach This book takes a very hands-on approach to developing an end-to-end application with OpenCV. To avoid being too theoretical, the description of concepts are accompanied simultaneously by the development of applications. Throughout the course of the book, the projects and practical, real-life examples are

explained and developed step by step in sync with the theory.

Programming Computer Vision with Python - Jan Erik Solem 2012-06-19

If you want a basic understanding of computer vision's underlying theory and algorithms, this hands-on introduction is the ideal place to start. You'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 won'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 you'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 applications Work with image mappings and transforms, such as texture warping and panorama creation Compute 3D reconstructions from several images of the same scene Organize images based on similarity or content, using clustering methods Build efficient image retrieval techniques to search for images based on visual content Use algorithms to classify image content and recognize objects Access the popular OpenCV library through a Python interface

Deep Learning for Computer Vision - Jason Brownlee 2019-04-04

Step-by-step tutorials on deep learning neural networks for computer vision in python with Keras.

Black Hat Python - Justin Seitz 2014-12-21

When it comes to creating powerful and effective hacking tools, Python is the language of choice for most security analysts. But just how does the magic happen? In *Black Hat Python*, the latest from Justin Seitz (author of the best-selling *Gray*

Hat Python), you'll explore the darker side of Python's capabilities—writing network sniffers, manipulating packets, infecting virtual machines, creating stealthy trojans, and more. You'll learn how to: -Create a trojan command-and-control using GitHub -Detect sandboxing and automate common malware tasks, like keylogging and screenshotting -Escalate Windows privileges with creative process control -Use offensive memory forensics tricks to retrieve password hashes and inject shellcode into a virtual machine -Extend the popular Burp Suite web-hacking tool -Abuse Windows COM automation to perform a man-in-the-browser attack -Exfiltrate data from a network most sneakily Insider techniques and creative challenges throughout show you how to extend the hacks and how to write your own exploits. When it comes to offensive security, your ability to create powerful tools on the fly is indispensable. Learn how in Black Hat Python. Uses Python 2

Mastering OpenCV 4 with Python - Alberto Fernández Villán 2019-03-29

Create advanced applications with Python and OpenCV, exploring the potential of facial recognition, machine learning, deep learning, web computing and augmented reality. Key Features Develop your computer vision skills by mastering algorithms in Open Source Computer Vision 4 (OpenCV 4) and Python Apply machine learning and deep learning techniques with TensorFlow and Keras Discover the modern design patterns you should avoid when developing efficient computer vision applications Book Description OpenCV is considered to be one of the best open source computer vision and machine learning software libraries. It helps developers build complete projects in relation to image processing, motion detection, or image segmentation, among many others. OpenCV for Python enables you to run computer vision algorithms smoothly in real time, combining the best of the OpenCV C++ API and the Python

language. In this book, you'll get started by setting up OpenCV and delving into the key concepts of computer vision. You'll then proceed to study more advanced concepts and discover the full potential of OpenCV. The book will also introduce you to the creation of advanced applications using Python and OpenCV, enabling you to develop applications that include facial recognition, target tracking, or augmented reality. Next, you'll learn machine learning techniques and concepts, understand how to apply them in real-world examples, and also explore their benefits, including real-time data production and faster data processing. You'll also discover how to translate the functionality provided by OpenCV into optimized application code projects using Python bindings. Toward the concluding chapters, you'll explore the application of artificial intelligence and deep learning techniques using the popular Python libraries TensorFlow, and Keras. By the end of this book, you'll be able to develop advanced

computer vision applications to meet your customers' demands. What you will learn Handle files and images, and explore various image processing techniques Explore image transformations, including translation, resizing, and cropping Gain insights into building histograms Brush up on contour detection, filtering, and drawing Work with Augmented Reality to build marker-based and markerless applications Work with the main machine learning algorithms in OpenCV Explore the deep learning Python libraries and OpenCV deep learning capabilities Create computer vision and deep learning web applications Who this book is for This book is designed for computer vision developers, engineers, and researchers who want to develop modern computer vision applications. Basic experience of OpenCV and Python programming is a must.

[OpenCV By Example](#) - Prateek Joshi 2016-01-22
Enhance your understanding of Computer Vision and image processing by developing real-world

projects in OpenCV 3 About This Book Get to grips with the basics of Computer Vision and image processing This is a step-by-step guide to developing several real-world Computer Vision projects using OpenCV 3 This book takes a special focus on working with Tesseract OCR, a free, open-source library to recognize text in images Who This Book Is For If you are a software developer with a basic understanding of Computer Vision and image processing and want to develop interesting Computer Vision applications with Open CV, this is the book for you. Knowledge of C++ is required. What You Will Learn Install OpenCV 3 on your operating system Create the required CMake scripts to compile the C++ application and manage its dependencies Get to grips with the Computer Vision workflows and understand the basic image matrix format and filters Understand the segmentation and feature extraction techniques Remove backgrounds from a static scene to identify moving objects for video surveillance

Track different objects in a live video using various techniques Use the new OpenCV functions for text detection and recognition with Tesseract In Detail Open CV is a cross-platform, free-for-use library that is primarily used for real-time Computer Vision and image processing. It is considered to be one of the best open source libraries that helps developers focus on constructing complete projects on image processing, motion detection, and image segmentation. Whether you are completely new to the concept of Computer Vision or have a basic understanding of it, this book will be your guide to understanding the basic OpenCV concepts and algorithms through amazing real-world examples and projects. Starting from the installation of OpenCV on your system and understanding the basics of image processing, we swiftly move on to creating optical flow video analysis or text recognition in complex scenes, and will take you through the commonly used Computer Vision techniques to build your own

Open CV projects from scratch. By the end of this book, you will be familiar with the basics of Open CV such as matrix operations, filters, and histograms, as well as more advanced concepts such as segmentation, machine learning, complex video analysis, and text recognition. Style and approach This book is a practical guide with lots of tips, and is closely focused on developing Computer vision applications with OpenCV. Beginning with the fundamentals, the complexity increases with each chapter. Sample applications are developed throughout the book that you can execute and use in your own projects.

OpenCV 3 Computer Vision Application Programming Cookbook - Robert Laganiere
2017-02-09

Recipes to help you build computer vision applications that make the most of the popular C++ library OpenCV 3 About This Book Written to the latest, gold-standard specification of OpenCV 3 Master OpenCV, the open source

library of the computer vision community Master fundamental concepts in computer vision and image processing Learn about the important classes and functions of OpenCV with complete working examples applied to real images Who This Book Is For OpenCV 3 Computer Vision Application Programming Cookbook Third Edition is appropriate for novice C++ programmers who want to learn how to use the OpenCV library to build computer vision applications. It is also suitable for professional software developers who wish to be introduced to the concepts of computer vision programming. It can also be used as a companion book for university-level computer vision courses. It constitutes an excellent reference for graduate students and researchers in image processing and computer vision. What You Will Learn Install and create a program using the OpenCV library Process an image by manipulating its pixels Analyze an image using histograms Segment images into homogenous

regions and extract meaningful objects Apply image filters to enhance image content Exploit the image geometry in order to relay different views of a pictured scene Calibrate the camera from different image observations Detect people and objects in images using machine learning techniques Reconstruct a 3D scene from images In Detail Making your applications see has never been easier with OpenCV. With it, you can teach your robot how to follow your cat, write a program to correctly identify the members of One Direction, or even help you find the right colors for your redecoration. OpenCV 3 Computer Vision Application Programming Cookbook Third Edition provides a complete introduction to the OpenCV library and explains how to build your first computer vision program. You will be presented with a variety of computer vision algorithms and exposed to important concepts in image and video analysis that will enable you to build your own computer vision applications. This book helps you to get started

with the library, and shows you how to install and deploy the OpenCV library to write effective computer vision applications following good programming practices. You will learn how to read and write images and manipulate their pixels. Different techniques for image enhancement and shape analysis will be presented. You will learn how to detect specific image features such as lines, circles or corners. You will be introduced to the concepts of mathematical morphology and image filtering. The most recent methods for image matching and object recognition are described, and you'll discover how to process video from files or cameras, as well as how to detect and track moving objects. Techniques to achieve camera calibration and perform multiple-view analysis will also be explained. Finally, you'll also get acquainted with recent approaches in machine learning and object classification. Style and approach This book will arm you with the basics you need to start writing world-aware

applications right from a pixel level all the way through to processing video sequences.

[Using Asyncio in Python](#) - Caleb Hattingh

2020-01-30

If you're among the Python developers put off by asyncio's complexity, it's time to take another look. Asyncio is complicated because it aims to solve problems in concurrent network programming for both framework and end-user developers. The features you need to consider are a small subset of the whole asyncio API, but picking out the right features is the tricky part. That's where this practical book comes in.

Veteran Python developer Caleb Hattingh helps you gain a basic understanding of asyncio's building blocks—enough to get started writing simple event-based programs. You'll learn why asyncio offers a safer alternative to preemptive multitasking (threading) and how this API provides a simple way to support thousands of simultaneous socket connections. Get a critical comparison of asyncio and threading for

concurrent network programming Take an asyncio walk-through, including a quickstart guide for hitting the ground looping with event-based programming Learn the difference between asyncio features for end-user developers and those for framework developers Understand asyncio's new async/await language syntax, including coroutines and task and future APIs Get detailed case studies (with code) of some popular asyncio-compatible third-party libraries

OpenCV Computer Vision with Python - Joseph Howse 2013

A practical, project-based tutorial for Python developers and hobbyists who want to get started with computer vision with OpenCV and Python. OpenCV Computer Vision with Python is written for Python developers who are new to computer vision and want a practical guide to teach them the essentials. Some understanding of image data (for example, pixels and color channels) would be beneficial. At a minimum you

will need access to at least one webcam. Certain exercises require additional hardware like a second webcam, a Microsoft Kinect or an OpenNI-compliant depth sensor such as the Asus Xtion PRO.

Practical OpenCV - Samarth Brahmhatt
2013-11-30

Practical OpenCV is a hands-on project book that shows you how to get the best results from OpenCV, the open-source computer vision library. Computer vision is key to technologies like object recognition, shape detection, and depth estimation. OpenCV is an open-source library with over 2500 algorithms that you can use to do all of these, as well as track moving objects, extract 3D models, and overlay augmented reality. It's used by major companies like Google (in its autonomous car), Intel, and Sony; and it is the backbone of the Robot Operating System's computer vision capability. In short, if you're working with computer vision at all, you need to know OpenCV. With Practical

OpenCV, you'll be able to: Get OpenCV up and running on Windows or Linux. Use OpenCV to control the camera board and run vision algorithms on Raspberry Pi. Understand what goes on behind the scenes in computer vision applications like object detection, image stitching, filtering, stereo vision, and more. Code complex computer vision projects for your class/hobby/robot/job, many of which can execute in real time on off-the-shelf processors. Combine different modules that you develop to create your own interactive computer vision app.

Learning OpenCV 3 Computer Vision with Python - Joe Minichino 2015-09-29

Unleash the power of computer vision with Python using OpenCV About This Book Create impressive applications with OpenCV and Python Familiarize yourself with advanced machine learning concepts Harness the power of computer vision with this easy-to-follow guide Who This Book Is For Intended for novices to the world of OpenCV and computer vision, as well as

OpenCV veterans that want to learn about what's new in OpenCV 3, this book is useful as a reference for experts and a training manual for beginners, or for anybody who wants to familiarize themselves with the concepts of object classification and detection in simple and understandable terms. Basic knowledge about Python and programming concepts is required, although the book has an easy learning curve both from a theoretical and coding point of view.

What You Will Learn
Install and familiarize yourself with OpenCV 3's Python API
Grasp the basics of image processing and video analysis
Identify and recognize objects in images and videos
Detect and recognize faces using OpenCV
Train and use your own object classifiers
Learn about machine learning concepts in a computer vision context
Work with artificial neural networks using OpenCV
Develop your own computer vision real-life application
In Detail

OpenCV 3 is a state-of-the-art computer vision library that allows a great variety of image and

video processing operations. Some of the more spectacular and futuristic features such as face recognition or object tracking are easily achievable with OpenCV 3. Learning the basic concepts behind computer vision algorithms, models, and OpenCV's API will enable the development of all sorts of real-world applications, including security and surveillance. Starting with basic image processing operations, the book will take you through to advanced computer vision concepts. Computer vision is a rapidly evolving science whose applications in the real world are exploding, so this book will appeal to computer vision novices as well as experts of the subject wanting to learn the brand new OpenCV 3.0.0. You will build a theoretical foundation of image processing and video analysis, and progress to the concepts of classification through machine learning, acquiring the technical know-how that will allow you to create and use object detectors and classifiers, and even track objects in movies or

video camera feeds. Finally, the journey will end in the world of artificial neural networks, along with the development of a hand-written digits recognition application. Style and approach This book is a comprehensive guide to the brand new OpenCV 3 with Python to develop real-life computer vision applications.

Python Cookbook - David Beazley 2013-05-10

If you need help writing programs in Python 3, or want to update older Python 2 code, this book is just the ticket. Packed with practical recipes written and tested with Python 3.3, this unique cookbook is for experienced Python programmers who want to focus on modern tools and idioms. Inside, you'll find complete recipes for more than a dozen topics, covering the core Python language as well as tasks common to a wide variety of application domains. Each recipe contains code samples you can use in your projects right away, along with a discussion about how and why the solution works. Topics include: Data Structures and

Algorithms Strings and Text Numbers, Dates, and Times Iterators and Generators Files and I/O Data Encoding and Processing Functions Classes and Objects Metaprogramming Modules and Packages Network and Web Programming Concurrency Utility Scripting and System Administration Testing, Debugging, and Exceptions C Extensions

Python Machine Learning - Wei-Meng Lee 2019-04-04

Python makes machine learning easy for beginners and experienced developers With computing power increasing exponentially and costs decreasing at the same time, there is no better time to learn machine learning using Python. Machine learning tasks that once required enormous processing power are now possible on desktop machines. However, machine learning is not for the faint of heart—it requires a good foundation in statistics, as well as programming knowledge. Python Machine Learning will help coders of all levels master one

of the most in-demand programming skillsets in use today. Readers will get started by following fundamental topics such as an introduction to Machine Learning and Data Science. For each learning algorithm, readers will use a real-life scenario to show how Python is used to solve the problem at hand. • Python data science—manipulating data and data visualization • Data cleansing • Understanding Machine learning algorithms • Supervised learning algorithms • Unsupervised learning algorithms • Deploying machine learning models Python Machine Learning is essential reading for students, developers, or anyone with a keen interest in taking their coding skills to the next level.

Computer Vision - Richard Szeliski 2010-09-30
Computer Vision: Algorithms and Applications explores the variety of techniques commonly used to analyze and interpret images. It also describes challenging real-world applications where vision is being successfully used, both for

specialized applications such as medical imaging, and for fun, consumer-level tasks such as image editing and stitching, which students can apply to their own personal photos and videos. More than just a source of “recipes,” this exceptionally authoritative and comprehensive textbook/reference also takes a scientific approach to basic vision problems, formulating physical models of the imaging process before inverting them to produce descriptions of a scene. These problems are also analyzed using statistical models and solved using rigorous engineering techniques. Topics and features: structured to support active curricula and project-oriented courses, with tips in the Introduction for using the book in a variety of customized courses; presents exercises at the end of each chapter with a heavy emphasis on testing algorithms and containing numerous suggestions for small mid-term projects; provides additional material and more detailed mathematical topics in the Appendices, which

cover linear algebra, numerical techniques, and Bayesian estimation theory; suggests additional reading at the end of each chapter, including the latest research in each sub-field, in addition to a full Bibliography at the end of the book; supplies supplementary course material for students at the associated website, <http://szeliski.org/Book/>. Suitable for an upper-level undergraduate or graduate-level course in computer science or engineering, this textbook focuses on basic techniques that work under real-world conditions and encourages students to push their creative boundaries. Its design and exposition also make it eminently suitable as a unique reference to the fundamental techniques and current research literature in computer vision.

End of the Megafauna: The Fate of the World's Hugest, Fiercest, and Strangest Animals - Ross D E MacPhee 2018-11-13

The fascinating lives and puzzling demise of some of the largest animals on earth. Until a few

thousand years ago, creatures that could have been from a sci-fi thriller—including gorilla-sized lemurs, 500-pound birds, and crocodiles that weighed a ton or more—roamed the earth. These great beasts, or “megafauna,” lived on every habitable continent and on many islands. With a handful of exceptions, all are now gone. What caused the disappearance of these prehistoric behemoths? No one event can be pinpointed as a specific cause, but several factors may have played a role. Paleomammalogist Ross D. E. MacPhee explores them all, examining the leading extinction theories, weighing the evidence, and presenting his own conclusions. He shows how theories of human overhunting and catastrophic climate change fail to account for critical features of these extinctions, and how new thinking is needed to elucidate these mysterious losses. Along the way, we learn how time is determined in earth history; how DNA is used to explain the genomics and phylogenetic history of megafauna—and how synthetic biology

and genetic engineering may be able to reintroduce these giants of the past. Until then,

gorgeous four-color illustrations by Peter Schouten re-create these megabeasts here in vivid detail.