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KEY=COMPUTER - JUAREZ KASSANDRA

OpenCV Computer Vision with Python *Packt Pub Limited* **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. **Computer Vision Projects with OpenCV and Python 3 Six end-to-end projects built using machine learning with OpenCV, Python, and TensorFlow** *Packt Publishing Ltd* **Gain a working knowledge of advanced machine learning and explore Python's powerful tools for extracting data from images and videos** **Key Features** Implement image classification and object detection using machine learning and deep learning Perform image classification, object detection, image segmentation, and other Computer Vision tasks **Crisp content with a practical approach to solving real-world**

problems in Computer Vision

Book Description Python is the ideal programming language for rapidly prototyping and developing production-grade codes for image processing and Computer Vision with its robust syntax and wealth of powerful libraries. This book will help you design and develop production-grade Computer Vision projects tackling real-world problems. With the help of this book, you will learn how to set up Anaconda and Python for the major OSes with cutting-edge third-party libraries for Computer Vision. You'll learn state-of-the-art techniques for classifying images, finding and identifying human postures, and detecting faces within videos. You will use powerful machine learning tools such as OpenCV, Dlib, and TensorFlow to build exciting projects such as classifying handwritten digits, detecting facial features, and much more. The book also covers some advanced projects, such as reading text from license plates from real-world images using Google's Tesseract software, and tracking human body poses using DeeperCut within TensorFlow. By the end of this book, you will have the expertise required to build your own Computer Vision projects using Python and its associated libraries. What you will learn

Install and run major Computer Vision packages within Python

Apply powerful support vector machines for simple digit classification

Understand deep learning with TensorFlow

Build a deep learning classifier for general images

Use LSTMs for automated image captioning

Read text from real-world images

Extract human pose data from images

Who this book is for

Python programmers and machine learning developers who wish to build exciting Computer Vision projects using the power of machine learning and OpenCV will find this book useful. The only prerequisite for this book is that you should have a sound knowledge of Python programming. **Learn Computer Vision Using OpenCV With Deep Learning CNNs and RNNs** *Apress*

Build practical applications of computer vision using the OpenCV library with Python. This book discusses different facets of computer vision such as image and object detection, tracking and motion analysis and their applications with examples. The author starts with an introduction to computer vision followed by setting up OpenCV from scratch using Python. The next section discusses specialized image processing and segmentation and how images are stored and processed by a computer. This involves pattern recognition and image tagging using the OpenCV library. Next, you'll work with object detection, video storage and interpretation, and human detection using OpenCV. Tracking and motion is also discussed in detail. The book also discusses creating complex deep learning models with CNN and RNN. The author finally concludes with recent applications and trends in computer vision. After reading this book, you will be able to understand and implement computer vision and its applications with OpenCV using Python. You will also be able to create deep learning models with CNN and RNN and understand how these cutting-edge deep learning architectures work. What You Will Learn

Understand what computer vision is, and its overall application in intelligent automation systems

Discover the deep learning techniques required to build computer vision

applications Build complex computer vision applications using the latest techniques in OpenCV, Python, and NumPy Create practical applications and implementations such as face detection and recognition, handwriting recognition, object detection, and tracking and motion analysis Who This Book Is For Those who have a basic understanding of machine learning and Python and are looking to learn computer vision and its applications. Learning OpenCV 4 Computer Vision with Python 3 Get to grips with tools, techniques, and algorithms for computer vision and machine learning, 3rd Edition *Packt Publishing Ltd* 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. **OpenCV 3 Computer Vision with Python Cookbook** Leverage the power of OpenCV 3 and Python to build computer vision applications *Packt Publishing Ltd* Recipe-based approach to tackle the most common problems in Computer Vision by leveraging the functionality of OpenCV using Python APIs **Key Features** ●Build computer vision applications with OpenCV functionality via Python API ●Get to grips with image processing, multiple view geometry, and machine learning ●Learn to use deep learning models for image classification, object detection, and face recognition **Book Description** OpenCV 3 is a native cross-platform library for computer vision, machine learning, and image processing. OpenCV's convenient high-level APIs hide very powerful internals designed for computational efficiency that can take advantage of multicore and GPU processing. This book will help you tackle increasingly challenging computer vision problems by providing a number of recipes that you can use to improve your applications. In this book, you will learn how to process an image by manipulating pixels and analyze an image using histograms. Then, we'll show you how to apply image filters to enhance image content and exploit the image geometry in order to relay different views of a pictured scene. We'll explore techniques to achieve camera calibration and perform a multiple-view analysis. Later, you'll work on reconstructing a 3D scene from images, converting low-level pixel information to high-level concepts for applications such as object detection and recognition. You'll also discover how to process video from files or cameras and how to detect and track moving objects. Finally, you'll get acquainted with recent approaches in deep learning and neural networks. By the end of the book, you'll be able to apply your skills in OpenCV to create computer vision applications in various domains. **What you will learn** ●Get familiar with low-level image processing methods ●See the common linear algebra tools needed in computer vision ●Work with different camera models and epipolar geometry ●Find out how to detect interesting points in images and compare them ●Binarize images and mask out regions of interest ●Detect objects and track them in videos **Who this book is for** This book is for developers who have a basic knowledge of Python. If you are aware of the basics of OpenCV and are ready to build computer vision systems that are smarter, faster, more complex, and more practical than the competition, then this book is for you. **Learning OpenCV 3 Computer Vision in C++ with the OpenCV Library** "O'Reilly Media, Inc." "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. **Learning OpenCV 3 Computer Vision with Python** *Packt Publishing Ltd* **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. OpenCV 4 with Python Blueprints Build creative computer vision projects with the latest version of OpenCV 4 and Python 3, 2nd Edition *Packt Publishing Ltd* Get to grips with traditional computer vision algorithms and deep learning approaches, and build real-world applications with OpenCV and other machine learning frameworks Key Features Understand how to capture high-quality image data, detect and track objects, and process the actions of animals or humans Implement your learning in different areas of computer vision Explore advanced concepts in OpenCV such as machine learning, artificial neural network, and augmented reality Book Description OpenCV is a native cross-platform C++ library for computer vision, machine

learning, and image processing. It is increasingly being adopted in Python for development. This book will get you hands-on with a wide range of intermediate to advanced projects using the latest version of the framework and language, OpenCV 4 and Python 3.8, instead of only covering the core concepts of OpenCV in theoretical lessons. This updated second edition will guide you through working on independent hands-on projects that focus on essential OpenCV concepts such as image processing, object detection, image manipulation, object tracking, and 3D scene reconstruction, in addition to statistical learning and neural networks. You'll begin with concepts such as image filters, Kinect depth sensor, and feature matching. As you advance, you'll not only get hands-on with reconstructing and visualizing a scene in 3D but also learn to track visually salient objects. The book will help you further build on your skills by demonstrating how to recognize traffic signs and emotions on faces. Later, you'll understand how to align images, and detect and track objects using neural networks. By the end of this OpenCV Python book, you'll have gained hands-on experience and become proficient at developing advanced computer vision apps according to specific business needs. What you will learn

- Generate real-time visual effects using filters and image manipulation techniques such as dodging and burning
- Recognize hand gestures in real-time and perform hand-shape analysis based on the output of a Microsoft Kinect sensor
- Learn feature extraction and feature matching to track arbitrary objects of interest
- Reconstruct a 3D real-world scene using 2D camera motion and camera reprojection techniques
- Detect faces using a cascade classifier and identify emotions in human faces using multilayer perceptrons
- Classify, localize, and detect objects with deep neural networks

Who this book is for This book is for intermediate-level OpenCV users who are looking to enhance their skills by developing advanced applications. Familiarity with OpenCV concepts and Python libraries, and basic knowledge of the Python programming language are assumed.

OpenCV: Computer Vision Projects with Python Get savvy with OpenCV and actualize cool computer vision applications

About This Book- Use OpenCV's Python bindings to capture video, manipulate images, and track objects- Learn about the different functions of OpenCV and their actual implementations.- Develop a series of intermediate to advanced projects using OpenCV and Python

Who This Book Is For This learning path is for someone who has a working knowledge of Python and wants to try out OpenCV. This Learning Path will take you from a beginner to an expert in computer vision applications using OpenCV. OpenCV's application are humongous and this Learning Path is the best resource to get yourself acquainted thoroughly with OpenCV.

What You Will Learn- Install OpenCV and related software such as Python, NumPy, SciPy, OpenNI, and SensorKinect - all on Windows, Mac or Ubuntu- Apply "curves" and other color transformations to simulate the look of old photos, movies, or video games- Apply geometric transformations to images, perform image filtering, and convert an image into a cartoon-like image- Recognize hand

gestures in real time and perform hand-shape analysis based on the output of a Microsoft Kinect sensor- Reconstruct a 3D real-world scene from 2D camera motion and common camera reprojection techniques- Detect and recognize street signs using a cascade classifier and support vector machines (SVMs)- Identify emotional expressions in human faces using convolutional neural networks (CNNs) and SVMs- Strengthen your OpenCV2 skills and learn how to use new OpenCV3 featuresIn DetailOpenCV is a state-of-art computer vision library that allows a great variety of image and video processing operations. OpenCV for Python enables us to run computer vision algorithms in real time. This learning path proposes to teach the following topics. First, we will learn how to get started with OpenCV and OpenCV3's Python API, and develop a computer vision application that tracks body parts. Then, we will build amazing intermediate-level computer vision applications such as making an object disappear from an image, identifying different shapes, reconstructing a 3D map from images , and building an augmented reality application, Finally, we'll move to more advanced projects such as hand gesture recognition, tracking visually salient objects, as well as recognizing traffic signs and emotions on faces using support vector machines and multi-layer perceptrons respectively. This Learning Path combines some of the best that Packt has to offer in one complete, curated package. It includes content from the following Packt products:- OpenCV Computer Vision with Python by Joseph Howse - OpenCV with Python By Example by Prateek Joshi- OpenCV with Python Blueprints by Michael BeyelerStyle and approachThis course aims to create a smooth learning path that will teach you how to get started with will learn how to get started with OpenCV and OpenCV 3's Python API, and develop superb computer vision applications. Through this comprehensive course, you'll learn to create computer vision applications from scratch to finish and more!. Learn Computer Vision Using OpenCV With Deep Learning CNNs and RNNs Build practical applications of computer vision using the OpenCV library with Python. This book discusses different facets of computer vision such as image and object detection, tracking and motion analysis and their applications with examples. The author starts with an introduction to computer vision followed by setting up OpenCV from scratch using Python. The next section discusses specialized image processing and segmentation and how images are stored and processed by a computer. This involves pattern recognition and image tagging using the OpenCV library. Next, you'll work with object detection, video storage and interpretation, and human detection using OpenCV. Tracking and motion is also discussed in detail. The book also discusses creating complex deep learning models with CNN and RNN. The author finally concludes with recent applications and trends in computer vision. After reading this book, you will be able to understand and implement computer vision and its applications with OpenCV using Python. You will also be able to create deep learning models with CNN and RNN and understand how these cutting-edge deep learning architectures work.

What You Will Learn Understand what computer vision is, and its overall application in intelligent automation systems Discover the deep learning techniques required to build computer vision applications Build complex computer vision applications using the latest techniques in OpenCV, Python, and NumPy Create practical applications and implementations such as face detection and recognition, handwriting recognition, object detection, and tracking and motion analysis **Who This Book Is For** Those who have a basic understanding of machine learning and Python and are looking to learn computer vision and its applications. **OpenCV: Computer Vision Projects with Python** *Packt Publishing Ltd* Get savvy with OpenCV and actualize cool computer vision applications **About This Book** Use OpenCV's Python bindings to capture video, manipulate images, and track objects Learn about the different functions of OpenCV and their actual implementations. Develop a series of intermediate to advanced projects using OpenCV and Python **Who This Book Is For** This learning path is for someone who has a working knowledge of Python and wants to try out OpenCV. This Learning Path will take you from a beginner to an expert in computer vision applications using OpenCV. OpenCV's application are humongous and this Learning Path is the best resource to get yourself acquainted thoroughly with OpenCV. **What You Will Learn** Install OpenCV and related software such as Python, NumPy, SciPy, OpenNI, and SensorKinect - all on Windows, Mac or Ubuntu Apply "curves" and other color transformations to simulate the look of old photos, movies, or video games Apply geometric transformations to images, perform image filtering, and convert an image into a cartoon-like image Recognize hand gestures in real time and perform hand-shape analysis based on the output of a Microsoft Kinect sensor Reconstruct a 3D real-world scene from 2D camera motion and common camera reprojection techniques Detect and recognize street signs using a cascade classifier and support vector machines (SVMs) Identify emotional expressions in human faces using convolutional neural networks (CNNs) and SVMs Strengthen your OpenCV2 skills and learn how to use new OpenCV3 features **In Detail** OpenCV is a state-of-art computer vision library that allows a great variety of image and video processing operations. OpenCV for Python enables us to run computer vision algorithms in real time. This learning path proposes to teach the following topics. First, we will learn how to get started with OpenCV and OpenCV3's Python API, and develop a computer vision application that tracks body parts. Then, we will build amazing intermediate-level computer vision applications such as making an object disappear from an image, identifying different shapes, reconstructing a 3D map from images , and building an augmented reality application, Finally, we'll move to more advanced projects such as hand gesture recognition, tracking visually salient objects, as well as recognizing traffic signs and emotions on faces using support vector machines and multi-layer perceptrons respectively. This Learning Path combines some of the best that Packt has to offer in one complete, curated package. It includes

content from the following Packt products: **OpenCV Computer Vision with Python** by Joseph Howse **OpenCV with Python By Example** by Prateek Joshi **OpenCV with Python Blueprints** by Michael Beyeler **Style and approach** This course aims to create a smooth learning path that will teach you how to get started with will learn how to get started with OpenCV and OpenCV 3's Python API, and develop superb computer vision applications. Through this comprehensive course, you'll learn to create computer vision applications from scratch to finish and more!. **Mastering OpenCV 4 with Python A practical guide covering topics from image processing, augmented reality to deep learning with OpenCV 4 and Python 3.7** *Packt Publishing Ltd* **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. Hands-On GPU-Accelerated Computer Vision with OpenCV and CUDA Effective techniques for processing complex image data in real time using GPUs *Packt Publishing Ltd* Discover how CUDA allows OpenCV to handle complex and rapidly growing image data processing in computer and machine vision by accessing the power of GPU Key Features Explore examples to leverage the GPU processing power with OpenCV and CUDA Enhance the performance of algorithms on embedded hardware platforms Discover C++ and Python libraries for GPU acceleration Book Description Computer vision has been revolutionizing a wide range of industries, and OpenCV is the most widely chosen tool for computer vision with its ability to work in multiple programming languages. Nowadays, in computer vision, there is a need to process large images in real time, which is difficult to handle for OpenCV on its own. This is where CUDA comes into the picture, allowing OpenCV to leverage powerful NVIDIA GPUs. This book provides a detailed overview of integrating OpenCV with CUDA for practical applications. To start with, you'll understand GPU programming with CUDA, an essential aspect for computer vision developers who have never worked with GPUs. You'll then move on to exploring OpenCV acceleration with GPUs and CUDA by walking through some practical examples. Once you have got to grips with the core concepts, you'll familiarize yourself with deploying OpenCV applications on NVIDIA Jetson TX1, which is popular for computer vision and deep learning applications. The last chapters of the book explain PyCUDA, a Python library that leverages the power of CUDA and GPUs for accelerations and can be used by computer vision developers who use OpenCV with Python. By the end of this book, you'll have enhanced computer vision applications with the help of this book's hands-on approach. What you will learn Understand how to access GPU device properties and capabilities from CUDA programs Learn how to accelerate searching and sorting algorithms Detect shapes such as lines and circles in images Explore object tracking and detection with algorithms Process videos using different video analysis techniques in Jetson TX1 Access GPU device properties from the PyCUDA program Understand how kernel execution works Who this book is for This book is a go-to guide for you if you are a developer working with OpenCV and want to learn how to process more complex image data by exploiting GPU processing. A thorough understanding of computer vision concepts and programming languages such as C++ or Python is expected. OpenCV Computer Vision with Python Learn to Capture Videos, Manipulate Images, and Track Objects with Python Using the OpenCV Library 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. Programming Computer Vision with Python Tools and algorithms for analyzing images "O'Reilly Media, Inc." 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 Raspberry Pi Computer Vision Programming -Second Edition Design and Implement Computer Vision Applications with Raspberry Pi, OpenCV, and Python 3 OpenCV Computer Vision with Python *CreateSpace* Learn to capture videos, manipulate images, and track objects with Python using the OpenCV Library Overview Set up OpenCV, its Python bindings, and optional Kinect drivers on Windows, Mac or Ubuntu Create an application that tracks and manipulates faces Identify face regions using normal color images and depth images In Detail Computer Vision can reach consumers in various contexts via webcams, camera phones and gaming sensors like Kinect. OpenCV's Python bindings can help developers meet these consumer demands for applications that capture images, change their appearance and extract information from them, in a high-level language and in a standardized data format that is interoperable with scientific libraries such as NumPy and SciPy. "OpenCV Computer Vision with Python" is a practical, hands-on guide that covers the fundamental tasks of computer vision-capturing, filtering and analyzing images-with step-by-step instructions for writing both an application and reusable library classes. "OpenCV Computer Vision with Python" shows you how to use the Python bindings for OpenCV. By following clear and concise examples you will develop a computer vision application that tracks faces in live video and applies special effects to them. If you have always wanted to learn which version of these bindings to use, how to integrate with cross-platform Kinect drivers and and how to efficiently process image data with NumPy and SciPy then this book is for you. What you will learn from

this book Install OpenCV and related software such as Python, NumPy, SciPy, OpenNI, and SensorKinect-all on Windows, Mac or Ubuntu Capture, display, and save photos and real-time videos Handle window events and input events using OpenCV's HighGui module or Pygame Understand OpenCV's image format and how to perform efficient operations on OpenCV images with NumPy and SciPy Apply "curves" and other color transformations to simulate the look of old photos, movies or video games Apply an effect only to edges in an image Copy and resize segments of an image Apply an effect only to certain depths in an image by using data from a depth sensor such as Kinect Track faces, eyes, noses and mouths by using prebuilt datasets Track arbitrary objects by creating original datasets Approach A practical, project-based tutorial for Python developers and hobbyists who want to get started with computer vision with OpenCV and Python. Who this book is written for 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. Learning OpenCV 3 Computer Vision with Python Unleash the Power of Computer Vision with Python Using OpenCV 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. **OpenCV Computer Vision Examples with Python A Complete Guide for Dummies** "Computer Vision is an AI based, that is, artificial intelligence-based technology that allows computers to understand and label images. So, learning and mastering this fantastic world of computer vision-based technology is surely up-market. It will make you proficient in competing with the swiftly changing image processing technology arena. And this course is designed in such a way that even the very beginner to programming can master the computer vision-based technology. So, overall this is a complete package in which you can learn computer vision-based technology, deep learning-based face detection, then face recognition and optical character recognition. And by the end of this course, we will provide you with a course completion certificate which you can keep with you and mention it in your portfolio so that you will be having more weight when you are dealing with jobs based on computer vision technology."--Resource description page. **The Python Bible Volume 7 Computer Vision (OpenCV, Object Recognition) Impressive Computer Vision with Python!** The Computer Vision field is one of the most interesting and exciting subjects of computer science. This field focuses on how computers perceive and process image and video data. The technologies of this field are essential for our future. With computer vision we are able to make unreadable texts readable. We are also able to recognize faces and other objects in real time. We can apply filters, transformations and lots of effects. If you want to be a part of this movement instead of being overrun by it, you should learn these skills as fast as possible! In this seventh volume of The Python Bible, we will build on the skills and knowledge of the previous volumes. You will receive a well-written and detailed book that will help you to become a computer vision expert in Python. You will learn to do many impressive things like making poorly lit texts readable, movement detection in videos and professional object recognition. In this book you will learn step-by-step, how to realize these projects. **After Reading This Book You Will Have The Following Skills:** - Understanding computer vision and visual computing- Understanding color schemes (RGB, BGR, HSV)- Making unreadable texts readable again with thresholding-

Extracting essential information out of images and videos- Edge detection- Template matching and feature matching- Movement detection in videos- Professional object recognition with OpenCV Master Computer Vision with Python and OpenCV! OpenCV 3.x with Python By Example Make the most of OpenCV and Python to build applications for object recognition and augmented reality, 2nd Edition Packt Publishing Ltd Learn the techniques for object recognition, 3D reconstruction, stereo imaging, and other computer vision applications using examples on different functions of OpenCV. Key Features Learn how to apply complex visual effects to images with OpenCV 3.x and Python Extract features from an image and use them to develop advanced applications Build algorithms to help you understand image content and perform visual searches Get to grips with advanced techniques in OpenCV such as machine learning, artificial neural network, 3D reconstruction, and augmented reality Book Description Computer vision is found everywhere in modern technology. OpenCV for Python enables us to run computer vision algorithms in real time. With the advent of powerful machines, we have more processing power to work with. Using this technology, we can seamlessly integrate our computer vision applications into the cloud. Focusing on OpenCV 3.x and Python 3.6, this book will walk you through all the building blocks needed to build amazing computer vision applications with ease. We start off by manipulating images using simple filtering and geometric transformations. We then discuss affine and projective transformations and see how we can use them to apply cool advanced manipulations to your photos like resizing them while keeping the content intact or smoothly removing undesired elements. We will then cover techniques of object tracking, body part recognition, and object recognition using advanced techniques of machine learning such as artificial neural network. 3D reconstruction and augmented reality techniques are also included. The book covers popular OpenCV libraries with the help of examples. This book is a practical tutorial that covers various examples at different levels, teaching you about the different functions of OpenCV and their actual implementation. By the end of this book, you will have acquired the skills to use OpenCV and Python to develop real-world computer vision applications. What you will learn Detect shapes and edges from images and videos How to apply filters on images and videos Use different techniques to manipulate and improve images Extract and manipulate particular parts of images and videos Track objects or colors from videos Recognize specific object or faces from images and videos How to create Augmented Reality applications Apply artificial neural networks and machine learning to improve object recognition Who this book is for This book is intended for Python developers who are new to OpenCV and want to develop computer vision applications with OpenCV and Python. This book is also useful for generic software developers who want to deploy computer vision applications on the cloud. It would be helpful to have some familiarity with basic mathematical concepts such as vectors, matrices, and so on. OpenCV with Python By Example Packt

Publishing Ltd **Build real-world computer vision applications and develop cool demos using OpenCV for Python About This Book Learn how to apply complex visual effects to images using geometric transformations and image filters Extract features from an image and use them to develop advanced applications Build algorithms to help you understand the image content and perform visual searches Who This Book Is For This book is intended for Python developers who are new to OpenCV and want to develop computer vision applications with OpenCV-Python. This book is also useful for generic software developers who want to deploy computer vision applications on the cloud. It would be helpful to have some familiarity with basic mathematical concepts such as vectors, matrices, and so on. What You Will Learn Apply geometric transformations to images, perform image filtering, and convert an image into a cartoon-like image Detect and track various body parts such as the face, nose, eyes, ears, and mouth Stitch multiple images of a scene together to create a panoramic image Make an object disappear from an image Identify different shapes, segment an image, and track an object in a live video Recognize an object in an image and build a visual search engine Reconstruct a 3D map from images Build an augmented reality application In Detail Computer vision is found everywhere in modern technology. OpenCV for Python enables us to run computer vision algorithms in real time. With the advent of powerful machines, we are getting more processing power to work with. Using this technology, we can seamlessly integrate our computer vision applications into the cloud. Web developers can develop complex applications without having to reinvent the wheel. This book will walk you through all the building blocks needed to build amazing computer vision applications with ease. We start off with applying geometric transformations to images. We then discuss affine and projective transformations and see how we can use them to apply cool geometric effects to photos. We will then cover techniques used for object recognition, 3D reconstruction, stereo imaging, and other computer vision applications. This book will also provide clear examples written in Python to build OpenCV applications. The book starts off with simple beginner's level tasks such as basic processing and handling images, image mapping, and detecting images. It also covers popular OpenCV libraries with the help of examples. The book is a practical tutorial that covers various examples at different levels, teaching you about the different functions of OpenCV and their actual implementation. Style and approach This is a conversational-style book filled with hands-on examples that are really easy to understand. Each topic is explained very clearly and is followed by a programmatic implementation so that the concept is solidified. Each topic contributes to something bigger in the following chapters, which helps you understand how to piece things together to build something big and complex. Hands-On Computer Vision with OpenCV 4, Keras, and TensorFlow 2 Build your own computer vision deep learning classifiers About This Video Gain a solid understanding of core computer vision concepts using OpenCV, and utilize deep learning to**

create advanced computer vision models Learn quickly without being bogged down by complex mathematical theory Use the latest libraries including the latest version of OpenCV 4, Keras, and TensorFlow 2.0-all running on Python 3.8 In Detail Do you want to understand how computers see images and videos? Using artificial intelligence, we can enable computers and smart devices to interpret what is in an image (computer vision). This can provide massive benefits when it comes to automating tasks for which images are vital, such as examining medical images or enabling self-driving cars to see. Already, these applications are creating a massive industry around computer vision-one that is set to grow rapidly, with some sources predicting that it will be worth over \$43 billion by 2023. This course provides you with a perfect foundation from which to understand computer vision and supports your professional development in this fast-growing arena. We first learn the basic concepts and explore these using OpenCV4, the most popular open-source computer vision library. Next, we explore using Machine Learning in computer vision, including the use of deep learning (using TensorFlow 2.0 and Keras) to implement advanced image classifiers. This course is designed to help data scientists, and those who already have some familiarity with ML and DL (and experience with Python, Keras, and TensorFlow), to gain a solid understanding of OpenCV and train their own computer vision deep learning models. OpenCV 3 Blueprints *Packt Publishing Ltd* Expand your knowledge of computer vision by building amazing projects with OpenCV 3 About This Book Build computer vision projects to capture high-quality image data, detect and track objects, process the actions of humans or animals, and much more Discover practical and interesting innovations in computer vision while building atop a mature open-source library, OpenCV 3 Familiarize yourself with multiple approaches and theories wherever critical decisions need to be made Who This Book Is For This book is ideal for you if you aspire to build computer vision systems that are smarter, faster, more complex, and more practical than the competition. This is an advanced book intended for those who already have some experience in setting up an OpenCV development environment and building applications with OpenCV. You should be comfortable with computer vision concepts, object-oriented programming, graphics programming, IDEs, and the command line. What You Will Learn Select and configure camera systems to see invisible light, fast motion, and distant objects Build a “camera trap”, as used by nature photographers, and process photos to create beautiful effects Develop a facial expression recognition system with various feature extraction techniques and machine learning methods Build a panorama Android application using the OpenCV stitching module in C++ with NDK support Optimize your object detection model, make it rotation invariant, and apply scene-specific constraints to make it faster and more robust Create a person identification and registration system based on biometric properties of that person, such as their fingerprint, iris, and face Fuse data from videos and gyroscopes to stabilize videos shot from your

mobile phone and create hyperlapse style videos In Detail Computer vision is becoming accessible to a large audience of software developers who can leverage mature libraries such as OpenCV. However, as they move beyond their first experiments in computer vision, developers may struggle to ensure that their solutions are sufficiently well optimized, well trained, robust, and adaptive in real-world conditions. With sufficient knowledge of OpenCV, these developers will have enough confidence to go about creating projects in the field of computer vision. This book will help you tackle increasingly challenging computer vision problems that you may face in your careers. It makes use of OpenCV 3 to work around some interesting projects. Inside these pages, you will find practical and innovative approaches that are battle-tested in the authors' industry experience and research. Each chapter covers the theory and practice of multiple complementary approaches so that you will be able to choose wisely in your future projects. You will also gain insights into the architecture and algorithms that underpin OpenCV's functionality. We begin by taking a critical look at inputs in order to decide which kinds of light, cameras, lenses, and image formats are best suited to a given purpose. We proceed to consider the finer aspects of computational photography as we build an automated camera to assist nature photographers. You will gain a deep understanding of some of the most widely applicable and reliable techniques in object detection, feature selection, tracking, and even biometric recognition. We will also build Android projects in which we explore the complexities of camera motion: first in panoramic image stitching and then in video stabilization. By the end of the book, you will have a much richer understanding of imaging, motion, machine learning, and the architecture of computer vision libraries and applications! Style and approach This book covers a combination of theory and practice. We examine blueprints for specific projects and discuss the principles behind these blueprints, in detail. Raspberry Pi Computer Vision Programming Design and implement computer vision applications with Raspberry Pi, OpenCV, and Python 3, 2nd Edition *Packt Publishing Ltd* Perform a wide variety of computer vision tasks such as image processing and manipulation, feature and object detection, and image restoration to build real-life computer vision applications Key Features Explore the potential of computer vision with Raspberry Pi and Python programming Perform computer vision tasks such as image processing and manipulation using OpenCV and Raspberry Pi Discover easy-to-follow examples and screenshots to implement popular computer vision techniques and applications Book Description Raspberry Pi is one of the popular single-board computers of our generation. All the major image processing and computer vision algorithms and operations can be implemented easily with OpenCV on Raspberry Pi. This updated second edition is packed with cutting-edge examples and new topics, and covers the latest versions of key technologies such as Python 3, Raspberry Pi, and OpenCV. This book will equip you with the skills required to successfully

design and implement your own OpenCV, Raspberry Pi, and Python-based computer vision projects. At the start, you'll learn the basics of Python 3, and the fundamentals of single-board computers and NumPy. Next, you'll discover how to install OpenCV 4 for Python 3 on Raspberry Pi, before covering major techniques and algorithms in image processing, manipulation, and computer vision. By working through the steps in each chapter, you'll understand essential OpenCV features. Later sections will take you through creating graphical user interface (GUI) apps with GPIO and OpenCV. You'll also learn to use the new computer vision library, Mahotas, to perform various image processing operations. Finally, you'll explore the Jupyter Notebook and how to set up a Windows computer and Ubuntu for computer vision. By the end of this book, you'll be able to confidently build and deploy computer vision apps. What you will learn

Set up a Raspberry Pi for computer vision applications
 Perform basic image processing with libraries such as NumPy, Matplotlib, and OpenCV
 Demonstrate arithmetical, logical, and other operations on images
 Work with a USB webcam and the Raspberry Pi Camera Module
 Implement low-pass and high-pass filters and understand their applications in image processing
 Cover advanced techniques such as histogram equalization and morphological transformations
 Create GUI apps with Python 3 and OpenCV
 Perform machine learning with K-means clustering and image quantization

Who this book is for This book is for beginners as well as experienced Raspberry Pi and Python 3 enthusiasts who are looking to explore the amazing world of computer vision. Working knowledge of the Python 3 programming language is assumed.

Building Computer Vision Projects with OpenCV 4 and C++
 Implement Complex Computer Vision Algorithms and Explore Deep Learning and Face Detection

Delve into practical computer vision and image processing projects and get up to speed with advanced object detection techniques and machine learning algorithms

Key Features
 Discover best practices for engineering and maintaining OpenCV projects
 Explore important deep learning tools for image classification
 Understand basic image matrix formats and filters

Book Description
 OpenCV is one of the best open source libraries available and can help you focus on constructing complete projects on image processing, motion detection, and image segmentation. This Learning Path is your guide to understanding OpenCV concepts and algorithms through real-world examples and activities. Through various projects, you'll also discover how to use complex computer vision and machine learning algorithms and face detection to extract the maximum amount of information from images and videos. In later chapters, you'll learn to enhance your videos and images with optical flow analysis and background subtraction. Sections in the Learning Path will help you get to grips with text segmentation and recognition, in addition to guiding you through the basics of the new and improved deep learning modules. By the end of this Learning Path, you will have mastered commonly used computer vision techniques to build OpenCV projects from scratch. This Learning Path

includes content from the following Packt books: **Mastering OpenCV 4 - Third Edition** by Roy Shilkrot and David Millán Escrivá **Learn OpenCV 4 By Building Projects - Second Edition** by David Millán Escrivá, Vinícius G. Mendonça, and Prateek Joshi **What you will learn Stay up-to-date with algorithmic design approaches for complex computer vision tasks Work with OpenCV's most up-to-date API through various projects Understand 3D scene reconstruction and Structure from Motion (SfM) Study camera calibration and overlay augmented reality (AR) using the ArUco module Create CMake scripts to compile your C++ application Explore segmentation and feature extraction techniques Remove backgrounds from static scenes to identify moving objects for surveillance Work with new OpenCV functions to detect and recognize text with Tesseract 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 OpenCV, this Learning Path is for you. Prior knowledge of C++ and familiarity with mathematical concepts will help you better understand the concepts in this Learning Path. OpenCV By Example Packt Publishing Ltd **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 4 for Secret Agents Use OpenCV 4 in secret projects to classify cats, reveal the unseen, and react to rogue drivers, 2nd Edition *Packt Publishing Ltd* Turn futuristic ideas about computer vision and machine learning into demonstrations that are both functional and entertaining

Key Features Build OpenCV 4 apps with Python 2 and 3 on desktops and Raspberry Pi, Java on Android, and C# in Unity Detect, classify, recognize, and measure real-world objects in real-time Work with images from diverse sources, including the web, research datasets, and various cameras

Book Description OpenCV 4 is a collection of image processing functions and computer vision algorithms. It is open source, supports many programming languages and platforms, and is fast enough for many real-time applications. With this handy library, you'll be able to build a variety of impressive gadgets.

OpenCV 4 for Secret Agents features a broad selection of projects based on computer vision, machine learning, and several application frameworks. To enable you to build apps for diverse desktop systems and Raspberry Pi, the book supports multiple Python versions, from 2.7 to 3.7. For Android app development, the book also supports Java in Android Studio, and C# in the Unity game engine.

Taking inspiration from the world of James Bond, this book will add a touch of adventure and computer vision to your daily routine. You'll be able to protect your home and car with intelligent camera systems that analyze obstacles, people, and even cats. In addition to this, you'll also learn how to train a search engine to praise or criticize the images that it finds, and build a mobile app that speaks to you and responds to your body language.

By the end of this book, you will be equipped with the knowledge you need to advance your skills as an app developer and a computer vision specialist. What you will learn

- Detect motion and recognize gestures to control a smartphone game
- Detect car headlights and estimate their distance
- Detect and recognize human and cat faces to trigger an alarm
- Amplify motion in a real-time video to show heartbeats and breaths
- Make a physics simulation that detects shapes in a real-world drawing

Build OpenCV 4 projects in Python 3 for desktops and Raspberry Pi

Develop OpenCV 4 Android applications in Android Studio and Unity

Who this book is for If you are an experienced software developer who is new to computer vision or machine learning, and wants to study these topics through creative projects, then this book is for you. The book will also help existing OpenCV users who want upgrade their projects to OpenCV 4 and new versions of other libraries, languages, tools, and operating systems.

General familiarity with object-oriented programming, application development, and usage of operating systems (OS), developer tools, and the command line is required. Learn OpenCV 4.5 with Python 3.7 by Examples *James Chen* What This Book is About When you searched for this book, you have already known the importance of the OpenCV/Python in the fields of computer vision, image processing and machine learning. This book begins with step-by-step instructions of installation as well as a simple Hello World, then gets into the OpenCV Basics, Image Processing, Object Detection and finally Machine Learning. Key Features Example for every topic, all the source codes are available in Github. Line by line explanation of the source codes. Focus mainly on implementation of algorithms, rather than mathematical theories. Whom This Book Is For This book is for people with a variety of computer programming levels, from those with very limited knowledge of computer vision to the experienced ones. The readers do not need to have previous experiences of Python/OpenCV. No matter you are a beginner or experienced programmer, as long as you want to learn OpenCV with Python, you will benefit from this book. Table of Contents 1. Introduction 1.1 What Is OpenCV 1.2 Whom This Book Is For 1.3 How to Get the Source Codes for This Book 1.4 Hardware Requirements and Software Versions 1.5 How This Book Is Organized 2. Installation 2.1 Install on Windows 2.2 Install Python on Ubuntu 2.3 Configure PyCharm and Install OpenCV 3. OpenCV Basics 3.1 Load and Display Images 3.2 Load and Display Videos 3.3 Display Webcam 3.4 Play Youtube Video 3.5 Image Fundamentals 3.6 Draw Shapes 3.7 Draw Texts 3.8 Draw an OpenCV-like Icon 4. User Interaction 4.1 Mouse Operations 4.2 Draw Circles with Mouse 4.3 Draw Polygon with Mouse 4.4 Crop an Image with Mouse 4.5 Input Values with Trackbars 5. Image Processing 5.1 Change Color Spaces 5.2 Resize, Crop and Rotate an Image 5.3 Adjust Contrast and Brightness of an Image 5.4 Adjust Hue, Saturation and Value 5.5 Blend Image 5.6 Bitwise Operation 5.7 Warp Image 5.8 Blur Image 5.9 Histogram 6. Object Detection 6.1 Canny Edge Detection 6.2 Dilation and Erosion 6.3 Shape Detection 6.4 Color Detection 6.5 Text Recognition with Tesseract 6.6 Human Detection 6.7 Face and Eye Detection 6.8 Remove Background 6.9 Blur Background 7. Machine Learning 7.1 K-Means Clustering 7.2 K-Nearest Neighbors 7.3 Support Vector Machine 7.4 Artificial Neural Network (ANN) About the Author Index OpenCV with Python Blueprints: Design and Develop Advanced Computer Vision Projects Using OpenCV with Python OpenCV with Python Blueprints *Packt Publishing Ltd* Design and develop advanced computer vision projects using OpenCV with Python About This Book Program advanced computer vision applications in Python using different features of the OpenCV library Practical end-to-end project covering an important computer vision problem All projects in the book include a step-by-step guide to create computer vision applications Who This Book Is For This book is for intermediate users of OpenCV who aim to master their skills by developing advanced practical applications. Readers are expected to be familiar with

OpenCV's concepts and Python libraries. Basic knowledge of Python programming is expected and assumed. What You Will Learn Generate real-time visual effects using different filters and image manipulation techniques such as dodging and burning Recognize hand gestures in real time and perform hand-shape analysis based on the output of a Microsoft Kinect sensor Learn feature extraction and feature matching for tracking arbitrary objects of interest Reconstruct a 3D real-world scene from 2D camera motion and common camera reprojection techniques Track visually salient objects by searching for and focusing on important regions of an image Detect faces using a cascade classifier and recognize emotional expressions in human faces using multi-layer perceptrons (MLPs) Recognize street signs using a multi-class adaptation of support vector machines (SVMs) Strengthen your OpenCV2 skills and learn how to use new OpenCV3 features In Detail OpenCV is a native cross platform C++ Library for computer vision, machine learning, and image processing. It is increasingly being adopted in Python for development. OpenCV has C++/C, Python, and Java interfaces with support for Windows, Linux, Mac, iOS, and Android. Developers using OpenCV build applications to process visual data; this can include live streaming data from a device like a camera, such as photographs or videos. OpenCV offers extensive libraries with over 500 functions This book demonstrates how to develop a series of intermediate to advanced projects using OpenCV and Python, rather than teaching the core concepts of OpenCV in theoretical lessons. Instead, the working projects developed in this book teach the reader how to apply their theoretical knowledge to topics such as image manipulation, augmented reality, object tracking, 3D scene reconstruction, statistical learning, and object categorization. By the end of this book, readers will be OpenCV experts whose newly gained experience allows them to develop their own advanced computer vision applications. Style and approach This book covers independent hands-on projects that teach important computer vision concepts like image processing and machine learning for OpenCV with multiple examples. Machine Learning for OpenCV 4 Intelligent algorithms for building image processing apps using OpenCV 4, Python, and scikit-learn, 2nd Edition *Packt Publishing Ltd* A practical guide to understanding the core machine learning and deep learning algorithms, and implementing them to create intelligent image processing systems using OpenCV 4 Key Features Gain insights into machine learning algorithms, and implement them using OpenCV 4 and scikit-learn Get up to speed with Intel OpenVINO and its integration with OpenCV 4 Implement high-performance machine learning models with helpful tips and best practices Book Description OpenCV is an opensource library for building computer vision apps. The latest release, OpenCV 4, offers a plethora of features and platform improvements that are covered comprehensively in this up-to-date second edition. You'll start by understanding the new features and setting up OpenCV 4 to build your computer vision applications. You will explore the fundamentals of machine learning and

even learn to design different algorithms that can be used for image processing. Gradually, the book will take you through supervised and unsupervised machine learning. You will gain hands-on experience using scikit-learn in Python for a variety of machine learning applications. Later chapters will focus on different machine learning algorithms, such as a decision tree, support vector machines (SVM), and Bayesian learning, and how they can be used for object detection computer vision operations. You will then delve into deep learning and ensemble learning, and discover their real-world applications, such as handwritten digit classification and gesture recognition. Finally, you'll get to grips with the latest Intel OpenVINO for building an image processing system. By the end of this book, you will have developed the skills you need to use machine learning for building intelligent computer vision applications with OpenCV 4. What you will learn

Understand the core machine learning concepts for image processing
Explore the theory behind machine learning and deep learning algorithm design
Discover effective techniques to train your deep learning models
Evaluate machine learning models to improve the performance of your models
Integrate algorithms such as support vector machines and Bayes classifier in your computer vision applications
Use OpenVINO with OpenCV 4 to speed up model inference

Who this book is for This book is for Computer Vision professionals, machine learning developers, or anyone who wants to learn machine learning algorithms and implement them using OpenCV 4. If you want to build real-world Computer Vision and image processing applications powered by machine learning, then this book is for you. Working knowledge of Python programming is required to get the most out of this book.

Practical Computer Vision Extract insightful information from images using TensorFlow, Keras, and OpenCV *Packt Publishing Ltd*

A practical guide designed to get you from basics to current state of art in computer vision systems.

Key Features Master the different tasks associated with Computer Vision and develop your own Computer Vision applications with ease Leverage the power of Python, Tensorflow, Keras, and OpenCV to perform image processing, object detection, feature detection and more With real-world datasets and fully functional code, this book is your one-stop guide to understanding Computer Vision

Book Description In this book, you will find several recently proposed methods in various domains of computer vision. You will start by setting up the proper Python environment to work on practical applications. This includes setting up libraries such as OpenCV, TensorFlow, and Keras using Anaconda. Using these libraries, you'll start to understand the concepts of image transformation and filtering. You will find a detailed explanation of feature detectors such as FAST and ORB; you'll use them to find similar-looking objects. With an introduction to convolutional neural nets, you will learn how to build a deep neural net using Keras and how to use it to classify the Fashion-MNIST dataset. With regard to object detection, you will learn the implementation of a simple face detector as well as the workings of complex deep-learning-based object detectors such as Faster R-CNN and

SSD using TensorFlow. You'll get started with semantic segmentation using FCN models and track objects with Deep SORT. Not only this, you will also use Visual SLAM techniques such as ORB-SLAM on a standard dataset. By the end of this book, you will have a firm understanding of the different computer vision techniques and how to apply them in your applications.

What you will learn

- Learn the basics of image manipulation with OpenCV
- Implement and visualize image filters such as smoothing, dilation, histogram equalization, and more
- Set up various libraries and platforms, such as OpenCV, Keras, and Tensorflow, in order to start using computer vision, along with appropriate datasets for each chapter, such as MSCOCO, MOT, and Fashion-MNIST
- Understand image transformation and downsampling with practical implementations.
- Explore neural networks for computer vision and convolutional neural networks using Keras
- Understand working on deep-learning-based object detection such as Faster-R-CNN, SSD, and more
- Explore deep-learning-based object tracking in action
- Understand Visual SLAM techniques such as ORB-SLAM

Who this book is for

This book is for machine learning practitioners and deep learning enthusiasts who want to understand and implement various tasks associated with Computer Vision and image processing in the most practical manner possible. Some programming experience would be beneficial while knowing Python would be an added bonus.

Robotics Process Automation

KHANNA PUBLISHING HOUSE

This Robotics Process Automation book describes the RPA platform for the future of business process automation. More precisely this RPA book has tried to innumerate the followings:

1. RPA that brings speed to your digital transformation.
2. RPA helps to get rid of resource burden and it's consequences.
3. This emphasizes Business process automation must be in the hands forntline.
4. Only Automation Anywhere Enterprise combines consumer-like usability with enterprise-class reliability, and security for RPA that empowers the workforce to automate on their own, in real time.
5. What does RPA mean for business?
 - Optimize labour investment
 - Increase capacity on demand
 - Increase speed and productivity
 - Maximize availability
 - Improve business process compliance
 - Improve controls
 - Improve auditability
 - Enhance security
 - deliver business intelligence
 - Enable digital transformation
 - Improve employee morale
6. Putting RPA to work and deploy your digital workforce in your businesses like insurance, finance, manufacturing and health care and also other. Deploy, manage and audit your Digital Workforce through a highly-intuitive RPA central command center, on-premise or in the cloud.

This RPA book also enable you to learn more about AI and machine language also factory automation, safeguard your data, analyze ald predict business performance, streamline your blended anywhere, big data ready for analytics. This book is made for BS/B,TECH and MS/M.TECH/MCA/MBA student who will have in-depth knowledge about RPA and its associated technologies falls in the same platform.

Computer Vision with Python 3

Unleash the power of computer vision with Python to carry out image processing and computer vision techniques

About This Book* Learn how to

build a full-fledged image processing application using free tools and libraries* Perform basic to advanced image and video stream processing with OpenCV's Python APIs* Understand and optimize various features of OpenCV with the help of easy-to-grasp examplesWho This Book Is ForThis book is for Python developers who want to perform image processing. It's ideal for those who want to explore the field of computer vision, and design and develop computer vision applications using Python. The reader is expected to have basic knowledge of Python.What You Will Learn* Working with open source libraries such Pillow, Scikit-image, and OpenCV* Writing programs such as edge detection, color processing, image feature extraction, and more* Implementing feature detection algorithms like LBP and ORB* Tracking objects using an external camera or a video file* Optical Character Recognition using Machine Learning.* Understanding Convolutional Neural Networks to learn patterns in images* Leveraging Cloud Infrastructure to provide Computer Vision as a ServiceIn DetailThis book is a thorough guide for developers who want to get started with building computer vision applications using Python 3. The book is divided into five sections: The Fundamentals of Image Processing, Applied Computer Vision, Making Applications Smarter, Extending your Capabilities using OpenCV, and Getting Hands on. Throughout this book, three image processing libraries Pillow, Scikit-Image, and OpenCV will be used to implement different computer vision algorithms.The book aims to equip readers to build Computer Vision applications that are capable of working in real-world scenarios effectively. Some of the applications that we will look at in the book are Optical Character Recognition, Object Tracking and building a Computer Vision as a Service platform that works over the internet.Style and approachEach stage of the book elaborates on various concepts and algorithms in image processing/computer vision using Python. This step-by-step guide can be used both as a tutorial and as a reference. Elements of Deep Learning for Computer Vision Explore Deep Neural Network Architectures, PyTorch, Object Detection Algorithms, and Computer Vision Applications for Python Coders (English Edition) *BPB Publications* Conceptualizing deep learning in computer vision applications using PyTorch and Python libraries. **KEY FEATURES** ● Covers a variety of computer vision projects, including face recognition and object recognition such as Yolo, Faster R-CNN. ● Includes graphical representations and illustrations of neural networks and teaches how to program them. ● Includes deep learning techniques and architectures introduced by Microsoft, Google, and the University of Oxford. **DESCRIPTION** Elements of Deep Learning for Computer Vision gives a thorough understanding of deep learning and provides highly accurate computer vision solutions while using libraries like PyTorch. This book introduces you to Deep Learning and explains all the concepts required to understand the basic working, development, and tuning of a neural network using Pytorch. The book then addresses the field of computer vision using two libraries, including the Python wrapper/version of OpenCV and PIL. After establishing and

understanding both the primary concepts, the book addresses them together by explaining Convolutional Neural Networks(CNNs). CNNs are further elaborated using top industry standards and research to explain how they provide complicated Object Detection in images and videos, while also explaining their evaluation. Towards the end, the book explains how to develop a fully functional object detection model, including its deployment over APIs. By the end of this book, you are well-equipped with the role of deep learning in the field of computer vision along with a guided process to design deep learning solutions. **WHAT YOU WILL LEARN** ● Get to know the mechanism of deep learning and how neural networks operate. ● Learn to develop a highly accurate neural network model. ● Access to rich Python libraries to address computer vision challenges. ● Build deep learning models using PyTorch and learn how to deploy using the API. ● Learn to develop Object Detection and Face Recognition models along with their deployment. **WHO THIS BOOK IS FOR** This book is for the readers who aspire to gain a strong fundamental understanding of how to infuse deep learning into computer vision and image processing applications. Readers are expected to have intermediate Python skills. No previous knowledge of PyTorch and Computer Vision is required. **TABLE OF CONTENTS** 1. An Introduction to Deep Learning 2. Supervised Learning 3. Gradient Descent 4. OpenCV with Python 5. Python Imaging Library and Pillow 6. Introduction to Convolutional Neural Networks 7. GoogLeNet, VGGNet, and ResNet 8. Understanding Object Detection 9. Popular Algorithms for Object Detection 10. Faster RCNN with PyTorch and YoloV4 with Darknet 11. Comparing Algorithms and API Deployment with Flask 12. Applications in Real World Building Computer Vision Applications Using Artificial Neural Networks With Step-by-Step Examples in OpenCV and TensorFlow with Python *Apress* Apply computer vision and machine learning concepts in developing business and industrial applications using a practical, step-by-step approach. The book comprises four main sections starting with setting up your programming environment and configuring your computer with all the prerequisites to run the code examples. Section 1 covers the basics of image and video processing with code examples of how to manipulate and extract useful information from the images. You will mainly use OpenCV with Python to work with examples in this section. Section 2 describes machine learning and neural network concepts as applied to computer vision. You will learn different algorithms of the neural network, such as convolutional neural network (CNN), region-based convolutional neural network (R-CNN), and YOLO. In this section, you will also learn how to train, tune, and manage neural networks for computer vision. Section 3 provides step-by-step examples of developing business and industrial applications, such as facial recognition in video surveillance and surface defect detection in manufacturing. The final section is about training neural networks involving a large number of images on cloud infrastructure, such as Amazon AWS, Google Cloud Platform, and Microsoft Azure. It walks you through the process of training distributed neural

networks for computer vision on GPU-based cloud infrastructure. By the time you finish reading *Building Computer Vision Applications Using Artificial Neural Networks* and working through the code examples, you will have developed some real-world use cases of computer vision with deep learning. What You Will Learn · Employ image processing, manipulation, and feature extraction techniques · Work with various deep learning algorithms for computer vision · Train, manage, and tune hyperparameters of CNNs and object detection models, such as R-CNN, SSD, and YOLO · Build neural network models using Keras and TensorFlow · Discover best practices when implementing computer vision applications in business and industry · Train distributed models on GPU-based cloud infrastructure Who This Book Is For Data scientists, analysts, and machine learning and software engineering professionals with Python programming knowledge. Learning Robotics using Python Design, simulate, program, and prototype an autonomous mobile robot using ROS, OpenCV, PCL, and Python, 2nd Edition *Packt Publishing Ltd* Design, simulate, and program interactive robots Key Features Design, simulate, build, and program an interactive autonomous mobile robot Leverage the power of ROS, Gazebo, and Python to enhance your robotic skills A hands-on guide to creating an autonomous mobile robot with the help of ROS and Python Book Description Robot Operating System (ROS) is one of the most popular robotics software frameworks in research and industry. It has various features for implementing different capabilities in a robot without implementing them from scratch. This book starts by showing you the fundamentals of ROS so you understand the basics of differential robots. Then, you'll learn about robot modeling and how to design and simulate it using ROS. Moving on, we'll design robot hardware and interfacing actuators. Then, you'll learn to configure and program depth sensors and LIDARs using ROS. Finally, you'll create a GUI for your robot using the Qt framework. By the end of this tutorial, you'll have a clear idea of how to integrate and assemble everything into a robot and how to bundle the software package. What you will learn Design a differential robot from scratch Model a differential robot using ROS and URDF Simulate a differential robot using ROS and Gazebo Design robot hardware electronics Interface robot actuators with embedded boards Explore the interfacing of different 3D depth cameras in ROS Implement autonomous navigation in ChefBot Create a GUI for robot control Who this book is for This book is for those who are conducting research in mobile robotics and autonomous navigation. As well as the robotics research domain, this book is also for the robot hobbyist community. You're expected to have a basic understanding of Linux commands and Python. Mastering OpenCV with Practical Computer Vision Projects *Packt Publishing Ltd* 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. Computer Vision with OpenCV 3 and Qt5 Build visually appealing, multithreaded, cross-platform computer vision applications *Packt Publishing Ltd* Blend the power of Qt with OpenCV to build cross-platform computer vision applications Key Features

- Start creating robust applications with the power of OpenCV and Qt combined
- Learn from scratch how to develop cross-platform computer vision applications
- Accentuate your OpenCV applications by developing them with Qt

Book Description Developers have been using OpenCV library to develop computer vision applications for a long time. However, they now need a more effective tool to get the job done and in a much better and modern way. Qt is one of the major frameworks available for this task at the moment. This book will teach you to develop applications with the combination of OpenCV 3 and Qt5, and how to create cross-platform computer vision applications. We'll begin by introducing Qt, its IDE, and its SDK. Next you'll learn how to use the OpenCV API to integrate both tools, and see how to configure Qt to use OpenCV. You'll go on to build a full-fledged computer vision application throughout the book. Later, you'll create a stunning UI application using the Qt widgets technology, where you'll display the images after they are processed in an efficient way. At the end of the book, you'll learn how to convert OpenCV Mat to Qt QImage. You'll also see how to efficiently process images to filter them, transform them, detect or track objects as well as analyze video. You'll become better at developing OpenCV applications. What you will learn

- Get an introduction to Qt IDE and SDK
- Be introduced to OpenCV and see how to communicate between OpenCV and Qt
- Understand how to create UI using Qt Widgets
- Learn to develop cross-platform applications using OpenCV 3 and Qt 5
- Explore the multithreaded application development features of Qt5
- Improve OpenCV 3 application development using Qt5
- Build, test, and deploy Qt and OpenCV apps, either dynamically or statically
- See Computer Vision technologies such as filtering and transformation of images, detecting and matching objects, template matching, object tracking, video and motion analysis, and much more
- Be introduced to QML and Qt Quick for iOS and Android application development

Who this book is for This book is for readers interested in building computer vision applications. Intermediate knowledge of C++ programming is expected. Even though no knowledge of Qt5 and OpenCV 3 is assumed, if you're familiar with these frameworks, you'll benefit.