Blob Detection using

OpenCV

cv2.SimpleBlobDetector()
cv2.HoughCircles()
cv2.threshold()

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James Chen

Blob Detection Using Opencv Python C Learn Opencv:

Hands-on ML Projects with OpenCV: Master Computer Vision and Machine Learning using OpenCV and Python Mugesh S.,2023-08-09 Be at your A game in building Intelligent systems by leveraging Computer vision and Machine Learning Key Features Step by step instructions and code snippets for real world ML projects Covers entire spectrum from basics to advanced concepts such as deep learning transfer learning and model optimization Loaded with practical tips and best practices for implementing machine learning with OpenCV for optimising your workflow Book Description This book is an in depth guide that merges machine learning techniques with OpenCV the most popular computer vision library using Python The book introduces fundamental concepts in machine learning and computer vision progressing to practical implementation with OpenCV Concepts related to image preprocessing contour and thresholding techniques motion detection and tracking are explained in a step by step manner using code and output snippets Hands on projects with real world datasets will offer you an invaluable experience in solving OpenCV challenges with machine learning It s an ultimate guide to explore areas like deep learning transfer learning and model optimization empowering readers to tackle complex tasks Every chapter offers practical tips and tricks to build effective ML models By the end you would have mastered and applied ML concepts confidently to real world computer vision problems and will be able to develop robust and accurate machine learning models for diverse applications Whether you are new to machine learning or seeking to enhance your computer vision skills This book is an invaluable resource for mastering the integration of machine learning and computer vision using OpenCV and Python What you will learn Learn how to work with images and perform basic image processing tasks using OpenCV Implement machine learning techniques to computer vision tasks such as image classification object detection and image segmentation Work on real world projects and datasets to gain hands on experience in applying machine learning techniques with OpenCV Explore the concepts of deep learning using Tensorflow and Keras and how it can be used for computer vision tasks Who is this book for This book is for everyone with a basic understanding of programming and who wants to apply machine learning in computer vision using OpenCV and Python Whether you re a student researcher or developer this book will equip you with practical skills for machine learning projects Some familiarity with Python and machine learning concepts is assumed Table of ContentsChapter 1 Getting Started With OpenCV Chapter 2 Basic Image Video Analytics in OpenCV Chapter 3 Image Processing 1 using OpenCV Chapter 4 Image Processing 2 using OpenCV Chapter 5 Thresholding and Contour Techniques Using OpenCV Chapter 6 Detect Corners and Road Lane using OpenCV Chapter 7 Object And Motion Detection Using Opencv Chapter 8 Image Segmentation and Detecting Faces Using OpenCV Chapter 9 Introduction to Deep Learning with OpenCV Chapter 10 Advance Deep Learning Projects with OpenCV Chapter 11 Deployment of OpenCV projects   **Learning OpenCV 4 Computer Vision with Python 3** Joseph Howse,Joe Minichino,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   Python Image Processing Cookbook Sandipan Dey,2020-04-17 Explore Keras scikit image open source computer vision OpenCV Matplotlib and a wide range of other Python tools and frameworks to solve real world image processing problems Key FeaturesDiscover solutions to complex image processing tasks using Python tools such as scikit image and KerasLearn popular concepts such as machine learning deep learning and neural networks for image processingExplore common and not so common challenges faced in image processingBook Description With the advancements in wireless devices and mobile technology there s increasing demand for people with digital image processing skills in order to extract useful information from the ever growing volume of images This book provides comprehensive coverage of the relevant tools and algorithms and

guides you through analysis and visualization for image processing With the help of over 60 cutting edge recipes you ll address common challenges in image processing and learn how to perform complex tasks such as object detection image segmentation and image reconstruction using large hybrid datasets Dedicated sections will also take you through implementing various image enhancement and image restoration techniques such as cartooning gradient blending and sparse dictionary learning As you advance you ll get to grips with face morphing and image segmentation techniques With an emphasis on practical solutions this book will help you apply deep learning techniques such as transfer learning and fine tuning to solve real world problems By the end of this book you ll be proficient in utilizing the capabilities of the Python ecosystem to implement various image processing techniques effectively What you will learnImplement supervised and unsupervised machine learning algorithms for image processingUse deep neural network models for advanced image processing tasksPerform image classification object detection and face recognitionApply image segmentation and registration techniques on medical images to assist doctorsUse classical image processing and deep learning methods for image restorationImplement text detection in images using Tesseract the optical character recognition OCR engineUnderstand image enhancement techniques such as gradient blendingWho this book is for This book is for image processing engineers computer vision engineers software developers machine learning engineers or anyone who wants to become well versed with image processing techniques and methods using a recipe based approach Although no image processing knowledge is expected prior Python coding experience is necessary to understand key concepts covered in the book   **Essential Robotic Development For Beginners A Hands-On Guide To Learning Robotic Fundamentals, Kinematics, Dynamics, Control System, Sensors And Programming With Real World Projects** , Essential Robotic Development for Beginners Unlock the Secrets to Building Your First Robot with Hands On Projects Are you fascinated by robotics and eager to dive into the world of automation and intelligent systems but don t know where to start Essential Robotic Development for Beginners is the ultimate guide to kickstarting your journey into the world of robotics programming control systems and sensors with no prior experience required This practical easy to follow handbook is designed for anyone curious about industrial robotics autonomous systems or mechatronics whether you re a complete beginner or already have some foundational knowledge and want to take your skills to the next level Inside you ll discover Robotics Fundamentals Get a solid understanding of core concepts such as kinematics dynamics and robot mechanics which are the backbone of every robotic system Hands On Programming Learn how to code and program your robots including Python programming and machine learning techniques to create dynamic responsive systems Sensors Actuators Explore how sensor technology allows robots to perceive their environment and how you can integrate them into your projects to build smarter more autonomous robots Real World Projects Apply your new skills to build practical real world projects from mobile robotics to robot design that bring theory to life with hands on experience Control Systems Understand how to implement process control and system

integration in your robotic projects making them capable of performing complex tasks autonomously Whether you re interested in creating robots for fun school projects or planning to dive deeper into industrial automation this book offers the perfect blend of theory and hands on practice By the end you ll have the knowledge and skills to build and program your own robotic systems from basic bots to more advanced collaborative robots Key Features Clear Beginner Friendly Language No technical jargon just practical advice and clear explanations tailored to beginners Comprehensive Coverage Learn everything from basic robotics programming to advanced robot control systems and integration with machine learning Real World Applications Each chapter is filled with practical exercises and projects designed to help you build real working robots you can test in the real world Get ready to step into the exciting world of robotics engineering and start building your future today Essential Robotic Development for Beginners is your gateway to becoming a robotics expert and launching your journey in robotics education robotics research and beyond   Smart Cities Sergio Nesmachnow,Luis Hernández Callejo,2019-02-20 This book constitutes the thoroughly refereed proceedings of the First Ibero American Congress ICSC CITIES 2018 held in Soria Spain in May 2018 The 15 full papers presented were carefully reviewed and selected from 101 submissions The papers cover wide research fields including smart cities energy efficiency and sustainability infrastructures smart mobility intelligent transportation systems Internet of Things governance and citizenship   Mastering Computer Vision with TensorFlow 2.x Krishnendu Kar,2020-05-15 Apply neural network architectures to build state of the art computer vision applications using the Python programming language Key FeaturesGain a fundamental understanding of advanced computer vision and neural network models in use todayCover tasks such as low level vision image classification and object detectionDevelop deep learning models on cloud platforms and optimize them using TensorFlow Lite and the OpenVINO toolkitBook Description Computer vision allows machines to gain human level understanding to visualize process and analyze images and videos This book focuses on using TensorFlow to help you learn advanced computer vision tasks such as image acquisition processing and analysis You ll start with the key principles of computer vision and deep learning to build a solid foundation before covering neural network architectures and understanding how they work rather than using them as a black box Next you ll explore architectures such as VGG ResNet Inception R CNN SSD YOLO and MobileNet As you advance you ll learn to use visual search methods using transfer learning You ll also cover advanced computer vision concepts such as semantic segmentation image inpainting with GAN s object tracking video segmentation and action recognition Later the book focuses on how machine learning and deep learning concepts can be used to perform tasks such as edge detection and face recognition You ll then discover how to develop powerful neural network models on your PC and on various cloud platforms Finally you ll learn to perform model optimization methods to deploy models on edge devices for real time inference By the end of this book you ll have a solid understanding of computer vision and be able to confidently develop models to automate tasks What you will learnExplore methods of feature extraction and image retrieval and visualize

different layers of the neural network modelUse TensorFlow for various visual search methods for real world scenariosBuild neural networks or adjust parameters to optimize the performance of modelsUnderstand TensorFlow DeepLab to perform semantic segmentation on images and DCGAN for image inpaintingEvaluate your model and optimize and integrate it into your application to operate at scaleGet up to speed with techniques for performing manual and automated image annotationWho this book is for This book is for computer vision professionals image processing professionals machine learning engineers and AI developers who have some knowledge of machine learning and deep learning and want to build expert level computer vision applications In addition to familiarity with TensorFlow Python knowledge will be required to get started with this book   *Deep Learning for Internet of Things Infrastructure* Uttam Ghosh,Mamoun Alazab,Ali Kashif Bashir,Al-Sakib Khan Pathan,2021-09-30 This book promotes and facilitates exchanges of research knowledge and findings across different disciplines on the design and investigation of deep learning DL based data analytics of IoT Internet of Things infrastructures Deep Learning for Internet of Things Infrastructure addresses emerging trends and issues on IoT systems and services across various application domains The book investigates the challenges posed by the implementation of deep learning on IoT networking models and services It provides fundamental theory model and methodology in interpreting aggregating processing and analyzing data for intelligent DL enabled IoT The book also explores new functions and technologies to provide adaptive services and intelligent applications for different end users FEATURES Promotes and facilitates exchanges of research knowledge and findings across different disciplines on the design and investigation of DL based data analytics of IoT infrastructures Addresses emerging trends and issues on IoT systems and services across various application domains Investigates the challenges posed by the implementation of deep learning on IoT networking models and services Provides fundamental theory model and methodology in interpreting aggregating processing and analyzing data for intelligent DL enabled IoT Explores new functions and technologies to provide adaptive services and intelligent applications for different end users Uttam Ghosh is an Assistant Professor in the Department of Electrical Engineering and Computer Science Vanderbilt University Nashville Tennessee USA Mamoun Alazab is an Associate Professor in the College of Engineering IT and Environment at Charles Darwin University Australia Ali Kashif Bashir is a Senior Lecturer Associate Professor and Program Leader of BSc H Computer Forensics and Security at the Department of Computing and Mathematics Manchester Metropolitan University United Kingdom Al Sakib Khan Pathan is an Adjunct Professor of Computer Science and Engineering at the Independent University Bangladesh   **Machine Learning in Information and Communication Technology** Hiren Kumar Deva Sarma,Vincenzo Piuri,Arun Kumar Pujari,2022-11-09 This book presents collection of research papers presented at International Conference on Information and Communication Technology ICICT 2021 organized by Department of Information Technology Sikkim Manipal Institute of Technology Sikkim India during 23 24 December 2021 The book includes papers in the research area of communication networks data science healthcare informatics bio medical

image processing security of information including cryptography machine learning applications and AI applications

Advanced Computational Intelligence and Intelligent Informatics Bin Xin,Naoyuki Kubota,Kewei Chen,Fangyan Dong,2023-10-29 This two volume set constitutes the refereed proceedings of the 8th International Workshop on Advanced Computational Intelligence and Intelligent Informatics IWACIII 2023 held in Beijing China in November 2023 The 56 papers presented were thoroughly reviewed and selected from the 118 qualifies submissions They are organized in the topical sections on intelligent information processing intelligent optimization and decision making pattern recognition and computer vision advanced control multi agent systems robotics   **OpenCV with Python Blueprints** Michael Beyeler,2015-10-19 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 peceptrons 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 Aditya Sharma,Vishwesh Ravi Shrimali,Michael Beyeler,2019-09-06 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 FeaturesGain insights into machine learning algorithms and implement them using OpenCV 4 and scikit learnGet up to speed with Intel OpenVINO and its integration with OpenCV 4Implement high performance machine learning models with helpful tips and best practicesBook 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 learnUnderstand the core machine learning concepts for image processingExplore the theory behind machine learning and deep learning algorithm designDiscover effective techniques to train your deep learning modelsEvaluate machine learning models to improve the performance of your modelsIntegrate algorithms such as support vector machines and Bayes classifier in your computer vision applicationsUse OpenVINO with OpenCV 4 to speed up model inferenceWho 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   *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   Learn OpenCV with Python by Examples James Chen,2023-05 This book is a comprehensive guide to learning the basics of computer vision and machine learning using the powerful OpenCV library and the Python programming language The book offers a practical hands on approach to learn the concepts and techniques of computer vision through practical example All codes in this book are available at Github Through a series of examples the book covers a wide range of topics including image and video processing feature detection

object detection and recognition machine learning and deep neural networks Each chapter includes detailed explanations of the concepts and techniques involved as well as practical examples and code snippets that demonstrate how to implement them in Python Throughout the book readers will work through hands on examples and projects learning how to build image processing applications from scratch Whether you are a beginner or an experienced programmer this book provides a valuable resource for learning computer vision with OpenCV and Python The clear and concise writing style makes it easy for readers to follow along and the numerous examples ensure that readers can practice and apply what they have learned By the end of the book readers will have a solid understanding of the fundamentals of computer vision and be able to build their own computer vision applications with confidence This book is an excellent resource for anyone looking to learn computer vision and machine learning using the OpenCV library and Python programming language Table of Contents 1 Introduction 5 2 Installation 13 2 1 Install on Windows 14 2 2 Install Python on Ubuntu 16 2 3 Configure PyCharm and Install OpenCV 18 3 OpenCV Basics 25 3 1 Load and Display Images 26 3 2 Load and Display Videos 30 3 3 Display Webcam 32 3 4 Image Fundamentals 35 3 5 Draw Shapes 42 3 6 Draw Texts 48 3 7 Draw an OpenCV like Icon 50 4 User Interaction 52 4 1 Mouse Operations 53 4 2 Draw Circles with Mouse 56 4 3 Draw Polygon with Mouse 60 4 4 Crop an Image with Mouse 62 4 5 Input Values with Trackbars 64 5 Image Processing 70 5 1 Conversion of Color Spaces 72 5 2 Resize Crop and Rotate an Image 77 5 3 Adjust Contrast and Brightness of an Image 83 5 4 Adjust Hue Saturation and Value 87 5 5 Blend Image 91 5 6 Bitwise Operation 94 5 7 Warp Image 101 5 8 Blur Image 107 5 9 Histogram 114 6 Object Detection 120 6 1 Canny Edge Detection 122 6 2 Dilation and Erosion 125 6 3 Shape Detection 129 6 4 Color Detection 139 6 5 Text Recognition with Tesseract 150 6 6 Human Detection 161 6 7 Face and Eye Detection 165 6 8 Remove Background 170 6 9 Blur Background 189 7 Machine Learning 196 7 1 K Means Clustering 200 7 2 K Nearest Neighbors 216 7 3 Support Vector Machine 237 7 4 Artificial Neural Network ANN 254 7 5 Convolutional Neural Network CNN 276 Index 305 References 308 About the Author 310

Hands-on ML Projects with OpenCV Mugesh S.,2023-08-10 Be at your A game in building Intelligent systems by leveraging Computer vision and Machine Learning KEY FEATURES Step by step instructions and code snippets for real world ML projects Covers entire spectrum from basics to advanced concepts such as deep learning transfer learning and model optimization Loaded with practical tips and best practices for implementing machine learning with OpenCV for optimising your workflow DESCRIPTION This book is an in depth guide that merges machine learning techniques with OpenCV the most popular computer vision library using Python The book introduces fundamental concepts in machine learning and computer vision progressing to practical implementation with OpenCV Concepts related to image preprocessing contour and thresholding techniques motion detection and tracking are explained in a step by step manner using code and output snippets Hands on projects with real world datasets will offer you an invaluable experience in solving OpenCV challenges with machine learning It s an ultimate guide to explore areas like deep learning transfer learning and model

optimization empowering readers to tackle complex tasks Every chapter offers practical tips and tricks to build effective ML models By the end you would have mastered and applied ML concepts confidently to real world computer vision problems and will be able to develop robust and accurate machine learning models for diverse applications Whether you are new to machine learning or seeking to enhance your computer vision skills This book is an invaluable resource for mastering the integration of machine learning and computer vision using OpenCV and Python WHAT WILL YOU LEARN Learn how to work with images and perform basic image processing tasks using OpenCV Implement machine learning techniques to computer vision tasks such as image classification object detection and image segmentation Work on real world projects and datasets to gain hands on experience in applying machine learning techniques with OpenCV Explore the concepts of deep learning using Tensorflow and Keras and how it can be used for computer vision tasks Understand the concept of transfer learning and how pre trained models can be leveraged for new tasks Utilize techniques for model optimization and deployment in resource constrained environments Implement end to end solutions and address challenges encountered in practical scenarios WHO IS THIS BOOK FOR This book is for everyone with a basic understanding of programming and who wants to apply machine learning in computer vision using OpenCV and Python Whether you re a student researcher or developer this book will equip you with practical skills for machine learning projects Some familiarity with Python and machine learning concepts is assumed Beginners too will find this book valuable as it offers clear examples and explanations for every concept TABLE OF CONTENTS Chapter 1 Getting Started With OpenCV Chapter 2 Basic Image Video Analytics in OpenCV Chapter 3 Image Processing 1 using OpenCV Chapter 4 Image Processing 2 using OpenCV Chapter 5 Thresholding and Contour Techniques Using OpenCV Chapter 6 Detect Corners and Road Lane using OpenCV Chapter 7 Object And Motion Detection Using Opencv Chapter 8 Image Segmentation and Detecting Faces Using OpenCV Chapter 9 Introduction to Deep Learning with OpenCV Chapter 10 Advance Deep Learning Projects with OpenCV Chapter 11 Deployment of OpenCV projects

Learn OpenCV with Python by Examples James Chen,2023-03-27 This book is a comprehensive guide to learning the basics of computer vision and machine learning using the powerful OpenCV library and the Python programming language The book offers a practical hands on approach to learning the concepts and techniques of computer vision through practical examples All codes in this book are available on Github Through a series of examples the book covers a wide range of topics including image and video processing feature detection object detection and recognition machine learning and deep neural networks Each chapter includes detailed explanations of the concepts and techniques involved as well as practical examples and code snippets demonstrating how to implement them in Python Throughout the book readers will work through hands on examples and projects learning how to build image processing applications from scratch Whether you are a beginner or an experienced programmer this book provides a valuable resource for learning computer vision with OpenCV and Python The clear and concise writing style makes it easy for readers to follow along and the numerous examples ensure that readers can

practice and apply what they have learned By the end of the book readers will have a solid understanding of the fundamentals of computer vision and be able to build their own computer vision applications with confidence This book is an excellent resource for anyone looking to learn computer vision and machine learning using the OpenCV library and Python programming language

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 FeaturesDevelop your computer vision skills by mastering algorithms in Open Source Computer Vision 4 OpenCV 4 and PythonApply machine learning and deep learning techniques with TensorFlow and KerasDiscover the modern design patterns you should avoid when developing efficient computer vision applicationsBook 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 learnHandle files and images and explore various image processing techniquesExplore image transformations including translation resizing and croppingGain insights into building histogramsBrush up on contour detection filtering and drawingWork with Augmented Reality to build marker based and markerless applicationsWork with the main machine learning algorithms in OpenCVExplore the deep learning Python libraries and OpenCV deep learning capabilitiesCreate computer vision and deep learning web applicationsWho 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 **Learning OpenCV 3 Computer Vision with Python** Joe Minichino,2015 Unleash the power of computer vision with Python using OpenCVAbout 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 guideWho This Book Is ForIntended 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 applicationIn DetailOpenCV 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 approachThis book is a comprehensive guide to the brand new OpenCV 3 with Python to develop real life computer vision applications **Machine Learning for**

OpenCV Michael Beyeler,2017-07-14 Expand your OpenCV knowledge and master key concepts of machine learning using this practical hands on guide About This Book Load store edit and visualize data using OpenCV and Python Grasp the fundamental concepts of classification regression and clustering Understand perform and experiment with machine learning techniques using this easy to follow guide Evaluate compare and choose the right algorithm for any task Who This Book Is For This book targets Python programmers who are already familiar with OpenCV this book will give you the tools and understanding required to build your own machine learning systems tailored to practical real world tasks What You Will Learn Explore and make effective use of OpenCV s machine learning module Learn deep learning for computer vision with Python Master linear regression and regularization techniques Classify objects such as flower species handwritten digits and pedestrians Explore the effective use of support vector machines boosted decision trees and random forests Get acquainted with neural networks and Deep Learning to address real world problems Discover hidden structures in your data using k means clustering Get to grips with data pre processing and feature engineering In Detail Machine learning is no longer just a buzzword it is all around us from protecting your email to automatically tagging friends in pictures to predicting what movies you like Computer vision is one of today s most exciting application fields of machine learning with Deep Learning driving innovative systems such as self driving cars and Google s DeepMind OpenCV lies at the intersection of these topics providing a comprehensive open source library for classic as well as state of the art computer vision and machine learning algorithms In combination with Python Anaconda you will have access to all the open source computing libraries you could possibly ask for Machine learning for OpenCV begins by introducing you to the essential concepts of statistical learning such as classification and regression Once all the basics are covered you will start exploring various algorithms such as decision trees support vector machines and Bayesian networks and learn how to combine them with other OpenCV functionality As the book progresses so will your machine learning skills until you are ready to take on today s hottest topic in the field Deep Learning By the end of this book you will be ready to take on your own machine learning problems either by building on the existing source code or developing your own algorithm from scratch Style and approach OpenCV machine learning connects the fundamental theoretical principles behind machine learning to their practical applications in a way that focuses on asking and answering the right questions This book walks you through the key elements of OpenCV and its powerful machine learning classes while demonstrating how to get to grips with a range of models   Learning OpenCV 3 Computer Vision with Python Joe Minichino,Joseph Howse,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 **Open Source Computer Vision for Beginners** Nuruzzaman Faruqui,2017-08-27 The best book to learn OpenCV Open Source Computer Vision using C in fastest possible way A complete book on OpenCV focused on applications rather than description Every application provided in this book has ready to use c code and line by line explanation of those codes with visual support In a nutshell this book is the best book for beginners who want to work with OpenCV using C

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