

Contour Detection using OpenCV



Opencv C Vs Python Vs Matlab For Computer Vision

Y Pai



Opencv C Vs Python Vs Matlab For Computer Vision:

Robotics Process Automation S. Muhkerjee, 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 its 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: Concepts, Methodologies, Tools, and Applications

Management Association, Information Resources,2018-02-02 The fields of computer vision and image processing are constantly evolving as new research and applications in these areas emerge Staying abreast of the most up to date developments in this field is necessary in order to promote further research and apply these developments in real world settings Computer Vision Concepts Methodologies Tools and Applications is an innovative reference source for the latest academic material on development of computers for gaining understanding about videos and digital images Highlighting a range of topics such as computational models machine learning and image processing this multi volume book is ideally designed for academicians technology professionals students and researchers interested in uncovering the latest innovations in the field

Advanced Technologies in Modern Robotic Applications Chenguang Yang,Hongbin Ma,Mengyin Fu,2016-05-18 This book presents in a systematic manner the advanced technologies used for various modern robot applications By bringing fresh ideas new concepts novel methods and tools into robot control robot vision human robot interaction teleoperation of robot and multiple robots system we are to provide a state of the art and comprehensive treatment of the advanced technologies for a wide range of robotic applications Particularly we focus on the topics of advanced control and obstacle avoidance techniques for robot to deal with unknown perturbations of visual servoing techniques which enable robot to autonomously operate in a dynamic environment and of advanced techniques involved in human robot interaction The book is primarily intended for researchers and engineers in the robotic and control community

It can also serve as complementary reading for robotics at the both graduate and undergraduate levels

Cyber Security in Intelligent Computing and Communications Rajeev Agrawal, Jing He, Emmanuel Shubhakar Pilli, Sanjeev Kumar, 2022-03-11 This book looks at cyber security challenges with topical advancements in computational intelligence and communication technologies This book includes invited peer reviewed chapters on the emerging intelligent computing and communication technology research advancements experimental outcomes and cyber security practices threats and attacks with challenges The book begins with a state of the art survey and reviews of cyber security trends and issues It further covers areas such as developments in intelligent computing and communication smart healthcare agriculture transportation online education and many more real life applications using IoT big data cloud computing artificial intelligence data science and machine learning This book is of interest to graduate postgraduate students researchers and academicians This book will be a valuable resource for practitioners and professionals working in smart city visualization through secure and intelligent application design development deployment to foster digital revolution and reliable integration of advanced computing and communication technologies with global significance

Innovations in Smart Cities Applications Volume 6 Mohamed Ben Ahmed, Anouar Abdelhakim Boudhir, Domingos Santos, Rogerio Dionisio, Nabil Benaya, 2023-03-01 This book highlights original research and recent advances in various fields related to smart cities and their applications Bringing together new contributions by prominent researchers from around the globe the book is a rich pedagogical tool and an inspiring research support for courses on computer science electrical engineering and urban sciences The book gathers papers presented at the 7th International Conference on Smart City Applications SCA 2022 held on October 19 21 2022 in Castelo Branco Portugal The technical program of SCA 2022 consisted of 80 papers The keynote speakers were Eng Loide Monteiro Foundation Smart City Cape Verde Prof Teodora Vuckovic University of Novi Sad Prof Susana Sargento University of Aveiro Prof Andy Van Den Dobbelen TU Delft and Prof Juan Corchado University of Salamanca SCA 2022 provided a good forum for all researchers to discuss all aspects of science and technology that are relevant to smart city applications

Proceedings of the 1st International Conference on New Materials, Machinery and Vehicle Engineering Jinyang Xu, Yukui Cai, Mohamed El Mansori, 2022-05-15 New materials are constantly being developed which may improve or transform many aspects of our lives and nowhere is this more exciting than in the fields of vehicle and machinery technology This book presents the proceedings of the 2022 International Conference on New Materials Machinery and Vehicle Engineering NMMVE 2022 held as a virtual event due to the COVID 19 pandemic and travel restrictions from 18 20 March 2022 NMMVE 2022 provides an international forum for researchers and engineers to present and discuss recent advances new techniques and applications in the fields of new materials machinery and vehicle engineering and attracts academics scientists engineers postgraduates and other professionals from a wide range of universities and institutions A total of 121 submissions were received from which 48 were accepted for inclusion in the conference and proceeding after a rigorous standard single blind reviewing process The

papers are grouped into 3 sections machinery 30 papers new materials 11 papers and vehicle engineering 7 papers Providing an overview of the latest developments in these fields the book will be of interest to all those wishing to know more about new materials and machine and vehicle engineering

Create, Share, and Save Money Using Open-Source Projects Joshua M. Pearce, 2020-10-29 Live a more sustainable and economical life using open source technology Designed for beginning hobbyists and makers this engaging guide is filled with ways to save money by making use of free and open source technologies on a wide and impressive range of products Written by a leader in the field of open source technology the book reveals the potential of at home manufacturing and recycling projects and even how to score free big ticket items including housing and electricity All the projects have big money saving in mind but also big fun Create Share and Save Money Using Open Source Projects lays out the many ways in which you can employ these resources on a small scale to live a more economical and sustainable lifestyle You ll find tons of DIY projects that demonstrate how to use open source software and hardware to save money on Digital photographs and videos Music software and instruments Scientific equipment Paper and audio books Maps and GIS data Patterns for clothing Security systems Cars Electricity

Broadband Communications, Networks, and Systems Xiaochun Cheng, 2025-02-06 This two volume set LNICST 601 and LNICST 602 constitutes the refereed post conference proceedings of the 14th International Conference on Broadband Communications Networks and Systems BROADNETS 2024 held in Hyderabad India in February 16 17 2024 The 49 full papers presented here were carefully reviewed and selected from 122 submissions These papers have been organized under the following topical sections in the two volumes Part I Communications Networks and Architectures Smart City Smart Grid Communication inspired Machine Learning ML for 5G 6G Part II Wireless Network Security and Privacy AI applications for 5G 6G

Computer Vision Projects with OpenCV and Python 3 Matthew Rever, 2018-12-28 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

[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

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 4 with Python Blueprints Dr. Menua Gevorgyan,Arsen Mamikonyan,Michael Beyeler,2020-03-20 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 FeaturesUnderstand how to capture high quality image data detect and track objects and process the actions of animals or humansImplement your learning in different areas of computer visionExplore advanced concepts in OpenCV such as machine learning artificial neural network and augmented realityBook

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 learnGenerate real time visual effects using filters and image manipulation techniques such as dodging and burningRecognize hand gestures in real time and perform hand shape analysis based on the output of a Microsoft Kinect sensorLearn feature extraction and feature matching to track arbitrary objects of interestReconstruct a 3D real world scene using 2D camera motion and camera reprojection techniquesDetect faces using a cascade classifier and identify emotions in human faces using multilayer perceptronsClassify localize and detect objects with deep neural networksWho 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 Joseph Howse, Prateek Joshi, Michael Beyeler, 2016-10-24 Get savvy with OpenCV and actualize cool computer vision applicationsAbout 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 PythonWho This Book Is ForThis 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

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

Mastering OpenCV 4 with Python Alberto Fernández Villán, 2019-03-29 Create advanced applications with Python and OpenCV exploring the potential of facial recognition machine learning deep learning web computing and augmented reality

Key Features Develop your computer vision skills by mastering algorithms in Open Source Computer Vision 4 OpenCV 4 and Python Apply machine learning and deep learning techniques with TensorFlow and Keras Discover the modern design patterns you should avoid when developing efficient computer vision applications

Book Description OpenCV is considered to be one of the best open source computer vision and machine learning software libraries It helps developers build complete projects in relation to image processing motion detection or image segmentation among many others OpenCV for Python enables you to run computer vision algorithms smoothly in real time combining the best of the OpenCV C API and the Python language In this book you ll get started by setting up OpenCV and delving into the key concepts of computer vision You ll then proceed to study more advanced concepts and discover the full potential of OpenCV The book will also introduce you to the creation of advanced applications using Python and OpenCV enabling you to develop applications that include facial recognition target tracking or augmented reality Next you ll learn machine learning techniques and concepts understand how to apply them in real world examples and also explore their benefits including real time data production and faster data processing You ll also discover how to translate the functionality provided by OpenCV into optimized application code projects using Python bindings

Toward the concluding chapters you ll explore the application of artificial intelligence and deep learning techniques using the popular Python libraries TensorFlow and Keras By the end of this book you ll be able to develop advanced computer vision applications to meet your customers demands What you will learn

Handle files and images and explore various image processing techniques Explore image transformations including translation resizing and cropping Gain insights into building histograms Brush up on contour detection filtering and drawing Work with Augmented Reality to build marker based and markerless applications Work with the main machine learning algorithms in OpenCV Explore the deep learning Python libraries and OpenCV deep learning capabilities Create computer vision and deep learning web applications

Who this book is for This book is designed for computer vision developers

engineers and researchers who want to develop modern computer vision applications Basic experience of OpenCV and Python programming is a must *Learning OpenCV 3 Computer Vision with Python* Joe Minichino,2015 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 3 Computer Vision with Python Cookbook** Aleksei Spizhevoi,Aleksandr Rybnikov,2018-03-23 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 *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

[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 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

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

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