

EXPERT INSIGHT

Learning OpenCV 5 Computer Vision with Python

Tackle computer vision and machine learning
with the newest tools, techniques and algorithms

Fourth Edition

**Joseph Howse
Joe Minichino**



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Opencv Computer Vision With Python Howse Joseph

Joseph Howse



Opencv Computer Vision With Python Howse Joseph:

OpenCV Computer Vision with Python Joseph Howse, 2013 A practical project based tutorial for Python developers and hobbyists who want to get started with computer vision with OpenCV and Python OpenCV Computer Vision with Python is written for Python developers who are new to computer vision and want a practical guide to teach them the essentials Some understanding of image data for example pixels and color channels would be beneficial At a minimum you will need access to at least one webcam Certain exercises require additional hardware like a second webcam a Microsoft Kinect or an OpenNI compliant depth sensor such as the Asus Xtion PRO *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 OpenCV: Computer Vision Projects with Python Joseph Howse, Prateek Joshi, Michael Beyeler, 2016-10-24 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 *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 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

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.

[OpenCV: Computer Vision Projects with Python](#) Joseph Howse, Prateek Joshi, Michael Beyeler, 2016-10-24

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 applications 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

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 [OpenCV 3 Blueprints](#) Joseph Howse,Steven Puttemans,Quan Hua,Utkarsh Sinha,2015-11-10 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

Learning OpenCV 5 Computer Vision with Python Joseph Howse, Joe Minichino, 2023-03 Updated for OpenCV 5 this book covers the latest on depth cameras 3D navigation deep neural networks and Cloud computing helping you solve real world computer vision problems with practical code

Key Features Build powerful computer vision applications in concise code with OpenCV 5 and Python 3 Learn the fundamental concepts of image processing object classification and 2D and 3D tracking Train use and understand machine learning models and deploy them in the Cloud

Book Description Computer vision is a rapidly evolving science in the field of artificial intelligence encompassing diverse use cases 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 5 and Python 3 You ll start by setting up OpenCV 5 with Python 3 on various platforms Next you ll learn how to perform basic operations such as reading writing manipulating and displaying images videos and camera feeds From taking you through image processing video analysis 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 You ll tackle two popular challenges face detection and face recognition You ll also learn about object classification and machine learning which will enable you to create and use object detectors and even track moving objects in real time Later you ll develop your skills in augmented reality and real world 3D navigation Finally you ll cover ANNs and DNNs learning how to develop apps for recognizing handwritten digits and classifying a person s gender and age and you ll deploy your solutions to the Cloud 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 5's Python 3 bindings Understand image processing and video analysis 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 augmented reality applications and navigate the real 3D world Train neural networks and deploy them as Cloud based solutions Who This Book Is For This OpenCV book is a good fit for Python programmers who want to get started with computer vision and machine learning This book will also be useful for Computer vision and AI ML developers who want to expand their OpenCV skills as well as experts who want to stay up to date with OpenCV 5

OpenCV Computer Vision with Python Joseph Howse, 2013 A practical project based tutorial for Python developers and hobbyists who want to get started with computer vision with OpenCV and Python OpenCV Computer Vision with Python is written for Python developers who are new to computer vision and want a practical guide to teach them the essentials Some understanding of image data for example pixels and color channels would be beneficial At a minimum you will need access to at least one webcam Certain exercises require additional hardware like a second webcam a Microsoft Kinect or an OpenNI compliant depth sensor such as the Asus Xtion PRO

iOS Application Development with OpenCV 3 Joseph Howse, 2016-06-30 Create four mobile apps and explore the world through photography and computer vision About This Book Efficiently harness iOS and OpenCV to capture and process high quality images at high speed Develop photographic apps and augmented reality apps quickly and easily Detect recognize and morph faces and objects Who This Book Is For If you want to do computational photography and computer vision on Apple's mobile devices then this book is for you No previous experience with app development or OpenCV is required However basic knowledge of C or Objective C is recommended What You Will Learn Use Xcode and Interface Builder to develop iOS apps Obtain OpenCV's standard modules and build extra modules from source Control all the parameters of the iOS device's camera Capture save and share photos and videos Analyze colors shapes and textures in ordinary and specialized photographs Blend and compare images to create special photographic effects and augmented reality tools Detect faces and morph facial features Classify coins and other objects In Detail iOS Application Development with OpenCV 3 enables you to turn your smartphone camera into an advanced tool for photography and computer vision Using the highly optimized OpenCV library you will process high resolution images in real time You will locate and classify objects and create models of their geometry As you develop photo and augmented reality apps you will gain a general understanding of iOS frameworks and developer tools plus a deeper understanding of the camera and image APIs After completing the book's four projects you will be a well rounded iOS developer with valuable experience in OpenCV Style and approach The book is practical creative and precise It shows you the steps to create and customize five projects that solve important problems for beginners in mobile app development and computer vision Complete source code and numerous

visual aids are included in each chapter Experimentation is an important part of the book You will use computer vision to explore the real world and then you will refine the projects based on your findings

Python Game Programming By Example Alejandro Rodas de Paz, Joseph Howse, 2015-09-28 A pragmatic guide for developing your own games with Python About This Book Strengthen your fundamentals of game programming with Python language Seven hands on games to create 2D and 3D games rapidly from scratch Illustrative guide to explore the different GUI libraries for building your games Who This Book Is For If you have ever wanted to create casual games in Python and you would like to explore various GUI technologies that this language offers this is the book for you This title is intended for beginners to Python with little or no knowledge of game development and it covers step by step how to build seven different games from the well known Space Invaders to a classical 3D platformer What You Will Learn Take advantage of Python's clean syntax to build games quickly Discover distinct frameworks for developing graphical applications Implement non player characters NPCs with autonomous and seemingly intelligent behaviors Design and code some popular games like Pong and tower defense Compose maps and levels for your sprite based games in an easy manner Modularize and apply object oriented principles during the design of your games Exploit libraries like Chimpunk2D cocos2d and Tkinter Create natural user interfaces NUIs using a camera and computer vision algorithms to interpret the player's real world actions In Detail With a growing interest in learning to program game development is an appealing topic for getting started with coding From geometry to basic Artificial Intelligence algorithms there are plenty of concepts that can be applied in almost every game Python is a widely used general purpose high level programming language It provides constructs intended to enable clear programs on both a small and large scale It is the third most popular language whose grammatical syntax is not predominantly based on C Python is also very easy to code and is also highly flexible which is exactly what is required for game development The user friendliness of this language allows beginners to code games without too much effort or training Python also works with very little code and in most cases uses the use cases approach reserving lengthy explicit coding for outliers and exceptions making game development an achievable feat Python Game Programming by Example enables readers to develop cool and popular games in Python without having in depth programming knowledge of Python The book includes seven hands on projects developed with several well known Python packages as well as a comprehensive explanation about the theory and design of each game It will teach readers about the techniques of game design and coding of some popular games like Pong and tower defense Thereafter it will allow readers to add levels of complexities to make the games more fun and realistic using 3D At the end of the book you will have added several GUI libraries like Chimpunk2D cocos2d and Tkinter in your tool belt as well as a handful of recipes and algorithms for developing games with Python Style and approach This book is an example based guide that will teach you to build games using Python This book follows a step by step approach as it is aimed at beginners who would like to get started with basic game development By the end of this book you will be competent game developers with

good knowledge of programming in Python **OpenCV 4 for Secret Agents** Joseph Howse,2019-04-30 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

Machine Learning in OpenCV Adrian Tam,Stefania Cristina,2024-01-09 This ebook is written in an engaging and approachable style you re familiar with from the Machine Learning Mastery series Discover exactly how to get started and use the machine learning capability in OpenCV that many people often overlook **OpenCV with Python By Example** Prateek Joshi,2015-09-22 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

[Android Application Programming with OpenCV](#) Joseph Howse,2013-09-25 A step by step tutorial to help you master computer vision and mobile app development This book is for Java developers who are new to computer vision and who would like to learn about how it is used in relation to application development It is assumed that you have previous experience in Java but not necessarily Android A basic understanding of image data for example pixels and color channels would be helpful too You are expected to have a mobile device running Android 2.2 Froyo or greater and it must have a camera

[OpenCV By Example](#) Prateek Joshi,David Millan Escriva,Vinicius Godoy,2016-01-22 Enhance your understanding of Computer Vision and image processing by developing real world projects in OpenCV 3 About This Book Get to grips with the basics of Computer Vision and image processing This is a step by step guide to developing several real world Computer Vision projects using OpenCV 3 This book takes a special focus on working with Tesseract OCR a free open source library to

recognize text in images Who This Book Is For If you are a software developer with a basic understanding of Computer Vision and image processing and want to develop interesting Computer Vision applications with Open CV this is the book for you Knowledge of C is required What You Will Learn Install OpenCV 3 on your operating system Create the required CMake scripts to compile the C application and manage its dependencies Get to grips with the Computer Vision workflows and understand the basic image matrix format and filters Understand the segmentation and feature extraction techniques Remove backgrounds from a static scene to identify moving objects for video surveillance Track different objects in a live video using various techniques Use the new OpenCV functions for text detection and recognition with Tesseract In Detail Open CV is a cross platform free for use library that is primarily used for real time Computer Vision and image processing It is considered to be one of the best open source libraries that helps developers focus on constructing complete projects on image processing motion detection and image segmentation Whether you are completely new to the concept of Computer Vision or have a basic understanding of it this book will be your guide to understanding the basic OpenCV concepts and algorithms through amazing real world examples and projects Starting from the installation of OpenCV on your system and understanding the basics of image processing we swiftly move on to creating optical flow video analysis or text recognition in complex scenes and will take you through the commonly used Computer Vision techniques to build your own Open CV projects from scratch By the end of this book you will be familiar with the basics of Open CV such as matrix operations filters and histograms as well as more advanced concepts such as segmentation machine learning complex video analysis and text recognition Style and approach This book is a practical guide with lots of tips and is closely focused on developing Computer vision applications with OpenCV Beginning with the fundamentals the complexity increases with each chapter Sample applications are developed throughout the book that you can execute and use in your own projects [Python Data Analysis Cookbook](#) Ivan Idris, 2016-07-22 Over 140 practical recipes to help you make sense of your data with ease and build production ready data apps About This Book Analyze Big Data sets create attractive visualizations and manipulate and process various data types Packed with rich recipes to help you learn and explore amazing algorithms for statistics and machine learning Authored by Ivan Idris expert in python programming and proud author of eight highly reviewed books Who This Book Is For This book teaches Python data analysis at an intermediate level with the goal of transforming you from journeyman to master Basic Python and data analysis skills and affinity are assumed What You Will Learn Set up reproducible data analysis Clean and transform data Apply advanced statistical analysis Create attractive data visualizations Web scrape and work with databases Hadoop and Spark Analyze images and time series data Mine text and analyze social networks Use machine learning and evaluate the results Take advantage of parallelism and concurrency In Detail Data analysis is a rapidly evolving field and Python is a multi paradigm programming language suitable for object oriented application development and functional design patterns As Python offers a range of tools and libraries for all purposes it has

slowly evolved as the primary language for data science including topics on data analysis visualization and machine learning Python Data Analysis Cookbook focuses on reproducibility and creating production ready systems You will start with recipes that set the foundation for data analysis with libraries such as matplotlib NumPy and pandas You will learn to create visualizations by choosing color maps and palettes then dive into statistical data analysis using distribution algorithms and correlations You ll then help you find your way around different data and numerical problems get to grips with Spark and HDFS and then set up migration scripts for web mining In this book you will dive deeper into recipes on spectral analysis smoothing and bootstrapping methods Moving on you will learn to rank stocks and check market efficiency then work with metrics and clusters You will achieve parallelism to improve system performance by using multiple threads and speeding up your code By the end of the book you will be capable of handling various data analysis techniques in Python and devising solutions for problem scenarios Style and Approach The book is written in cookbook style striving for high realism in data analysis Through the recipe based format you can read each recipe separately as required and immediately apply the knowledge gained

[Computer Vision for the Web](#) Foat Akhmadeev,2015-10-14 Unleash the power of the Computer Vision algorithms in JavaScript to develop vision enabled web content About This Book Explore the exciting world of image processing and face and gesture recognition and implement them in your website Develop wonderful web projects to implement Computer Vision algorithms in an effective way A fast paced guide to help you deal with real world Computer Vision applications using JavaScript libraries Who This Book Is For If you have an interest in Computer Vision or wish to apply Computer Vision algorithms such as face custom object and gesture recognition for an online application then this book is ideal for you Prior understanding of the JavaScript language and core mathematical concepts is recommended What You Will Learn Apply complex Computer Vision algorithms in your applications using JavaScript Put together different JavaScript libraries to discover objects in photos Get to grips with developing simple computer vision applications on your own Understand when and why you should use different computer vision methods Apply various image filters to images and videos Recognize and track many different objects including face and face particles using powerful face recognition algorithms Explore ways to control your browser without touching the mouse or keyboard In Detail JavaScript is a dynamic and prototype based programming language supported by every browser today JavaScript libraries boast outstanding functionalities that enable you to furnish your own Computer Vision projects making it easier to develop JavaScript based applications especially for web centric technologies It makes the implementation of Computer Vision algorithms easier as it supports scheme based functional programming This book will give you an insight into controlling your applications with gestures and head motion and readying them for the web Packed with real world tasks it begins with a walkthrough of the basic concepts of Computer Vision that the JavaScript world offers us and you ll implement various powerful algorithms in your own online application Then we move on to a comprehensive analysis of JavaScript functions and their applications

Furthermore the book will show you how to implement filters and image segmentation and use tracking.js and jsfeat libraries to convert your browser into Photoshop. Subjects such as object and custom detection, feature extraction and object matching are covered to help you find an object in a photo. You will see how a complex object such as a face can be recognized by a browser as you move toward the end of the book. Finally you will focus on algorithms to create a human interface. By the end of this book you will be familiarized with the application of complex Computer Vision algorithms to develop your own applications without spending much time learning sophisticated theory. Style and approach This book is an easy to follow project based guide that throws you directly into the excitement of the Computer Vision theme. A more in less approach is followed by important concepts explained in a to the point easy to understand manner.

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 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

Unveiling the Power of Verbal Art: An Emotional Sojourn through **Opencv Computer Vision With Python Howse Joseph**

In some sort of inundated with displays and the cacophony of fast connection, the profound energy and emotional resonance of verbal beauty often disappear in to obscurity, eclipsed by the constant onslaught of noise and distractions. Yet, set within the musical pages of **Opencv Computer Vision With Python Howse Joseph**, a fascinating work of fictional brilliance that impulses with organic feelings, lies an memorable trip waiting to be embarked upon. Penned by a virtuoso wordsmith, this interesting opus guides viewers on an emotional odyssey, lightly exposing the latent possible and profound impact embedded within the delicate internet of language. Within the heart-wrenching expanse of this evocative examination, we shall embark upon an introspective exploration of the book is central themes, dissect their captivating writing design, and immerse ourselves in the indelible impression it leaves upon the depths of readers souls.

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