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Proceedings of CECNet 2022 - A.J. Tallón-Ballesteros
2022-12-29

Electronics, communication and networks coexist, and it is not possible to conceive of our current society without them. Within the next decade we will probably see the consolidation of 6G-based technology, accompanied by many compatible devices, and fiber-optic is already an advanced technology with many applications. This book presents the proceedings of CECNet 2022, the 12th International Conference on Electronics, Communications and Networks, held as a virtual event with no face-to-face participation in Xiamen, China, from 4 to 7 November 2022. CECNet is held annually, and covers many interrelated groups of topics such as electronics technology, communication engineering and technology, wireless communications engineering and technology and computer engineering and technology. This year the conference committee received 313 submissions. All papers were carefully reviewed by program committee members, taking into consideration the breadth and depth of research topics falling within the scope of the conference, and after further discussion, 79 papers were selected for presentation at the conference and for publication in this book. This represents an acceptance rate of about 25%. The book offers an overview of the latest research and developments in these rapidly evolving fields, and will be of interest to all those working with electronics, communication and networks.

3D Imaging Technologies—Multi-dimensional Signal Processing and Deep Learning - Lakhmi C. Jain 2021-10-01
This book presents high-quality research in the field of 3D imaging technology. The second edition of International Conference on 3D Imaging Technology (3DDIT-MSP&DL) continues the good traditions already established by the first 3DIT conference (IC3DIT2019) to provide a wide scientific forum for researchers, academia and practitioners to exchange newest ideas and recent achievements in all aspects of image processing and analysis, together with their contemporary applications. The conference proceedings are published in 2 volumes. The main topics of the papers comprise famous trends as: 3D image representation, 3D image technology, 3D images and graphics, and computing and 3D information technology. In these proceedings, special attention is paid at the 3D tensor image representation, the 3D content generation technologies, big data analysis, and also deep learning, artificial intelligence, the 3D image analysis and video understanding, the 3D virtual and augmented reality, and many related areas. The first volume contains papers in 3D image processing, transforms and technologies. The second volume is about computing and information technologies, computer images and graphics and related applications. The two volumes of the book cover a wide area of the aspects of the contemporary multidimensional imaging and the related future trends from data acquisition to real-world applications based on various techniques and theoretical approaches.

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

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

OpenCV 3 Computer Vision with Python Cookbook - Aleksei Spizhevoi 2018-03-23

Recipe-based approach to tackle the most common problems

in Computer Vision by leveraging the functionality of OpenCV using Python APIs Key Features ●Build computer vision applications with OpenCV functionality via Python API ●Get to grips with image processing, multiple view geometry, and machine learning ●Learn to use deep learning models for image classification, object detection, and face recognition Book Description OpenCV 3 is a native cross-platform library for computer vision, machine learning, and image processing. OpenCV's convenient high-level APIs hide very powerful internals designed for computational efficiency that can take advantage of multicore and GPU processing. This book will help you tackle increasingly challenging computer vision problems by providing a number of recipes that you can use to improve your applications. In this book, you will learn how to process an image by manipulating pixels and analyze an image using histograms. Then, we'll show you how to apply image filters to enhance image content and exploit the image geometry in order to relay different views of a pictured scene. We'll explore techniques to achieve camera calibration and perform a multiple-view analysis. Later, you'll work on reconstructing a 3D scene from images, converting low-level pixel information to high-level concepts for applications such as object detection and recognition. You'll also discover how to process video from files or cameras and how to detect and track moving objects. Finally, you'll get acquainted with recent approaches in deep learning and neural networks. By the end of the book, you'll be able to apply your skills in OpenCV to create computer vision applications in various domains. What you will learn ●Get familiar with low-level image processing methods ●See the common linear algebra tools needed in computer vision ●Work with different camera models and epipolar geometry ●Find out how to detect interesting points in images and compare them ●Binarize images and mask out regions of interest ●Detect objects and track them in videos Who this book is for This book is for developers who have a basic knowledge of Python. If you are aware of the basics of OpenCV and are ready to build computer vision systems that are smarter, faster, more complex, and more practical than the competition, then this book is for you.

Proceedings of the 2nd International Conference on Computational and Bio Engineering - S. Jyothi 2021-09-27

This book presents the peer-reviewed proceedings of the 2nd International Conference on Computational and Bioengineering (CBE 2020) jointly organized in virtual mode by the Department of Computer Science and the Department of BioScience & Sericulture, Sri Padmavati Mahila Visvavidyalayam (Women's University), Tirupati, Andhra Pradesh, India, during 4-5 December 2020. The book includes the latest research on advanced computational methodologies such as artificial intelligence, data mining and data warehousing, cloud computing, computational intelligence, soft computing, image processing, Internet of things, cognitive computing, wireless networks, social networks, big data analytics, machine learning, network security, computer networks and communications, bioinformatics, biocomputing/biometrics, computational biology, biomaterials, bioengineering, and medical and biomedical informatics.

Learning TensorFlow - Tom Hope 2017-08-09

Roughly inspired by the human brain, deep neural networks trained with large amounts of data can solve complex tasks with unprecedented accuracy. This practical book provides an end-to-end guide to TensorFlow, the leading open source software library that helps you build and train neural networks for computer vision, natural language processing (NLP), speech recognition, and general predictive analytics.

Authors Tom Hope, Yehezkel Resheff, and Itay Lieder provide a hands-on approach to TensorFlow fundamentals for a broad technical audience—from data scientists and engineers to students and researchers. You'll begin by working through some basic examples in TensorFlow before diving deeper into topics such as neural network architectures, TensorBoard visualization, TensorFlow abstraction libraries, and multithreaded input pipelines. Once you finish this book, you'll know how to build and deploy production-ready deep learning systems in TensorFlow. Get up and running with TensorFlow, rapidly and painlessly Learn how to use TensorFlow to build deep learning models from the ground up Train popular deep learning models for computer vision and NLP Use extensive abstraction libraries to make development easier and faster Learn how to scale TensorFlow, and use clusters to distribute model training Deploy TensorFlow in a production setting

Convergence and Hybrid Information Technology - Geuk Lee 2012-08-21

This book constitutes the refereed proceedings of the 6th International Conference on Convergence and Hybrid Information Technology, ICHIT 2012, held in Daejeon, Korea, in August 2012. The 102 revised full papers presented were carefully reviewed and selected from 196 submissions. The papers are organized in topical sections on communications and networking; soft computing and intelligent systems; medical information and bioinformatics; security and safety systems; HCI and data mining; software and hardware engineering; image processing and pattern recognition; robotics and RFID technologies; convergence in information technology; workshop on advanced smart convergence (IWASC).

Picture Processing by Computer - Azriel Rosenfeld 1969

The field of picture processing by computer is reviewed from a technique-oriented standpoint. Only the processing of given pictures (as opposed to computer-synthesized pictures) is considered. Specific areas covered include: (a) Pictures as information sources and their efficient encoding; (b) Approximation of pictures - sampling and quantization techniques; (c) Position-invariant operations on pictures and their implementation (digital, electro-optical, optical); applications to matched filtering (template matching), spatial frequency filtering and image restoration, measurement of image quality, and image enhancement ('smoothing' and 'sharpening'); (d) Picture properties (linear; local and 'textural'; random) useful for pictorial pattern recognition; (e) 'Figure extraction' from pictures; figure properties (topology, size, shape); (f) Picture description and 'picture languages.' (Author).

Real-World Python - Lee Vaughan 2020-11-05

A project-based approach to learning Python programming for beginners. Intriguing projects teach you how to tackle challenging problems with code. You've mastered the basics. Now you're ready to explore some of Python's more powerful tools. Real-World Python will show you how. Through a series of hands-on projects, you'll investigate and solve real-world problems using sophisticated computer vision, machine learning, data analysis, and language processing tools. You'll be introduced to important modules like OpenCV, NumPy, Pandas, NLTK, Bokeh, Beautiful Soup, Requests, HoloViews, Tkinter, turtle, matplotlib, and more. You'll create complete, working programs and think through intriguing projects that show you how to: Save shipwrecked sailors with an algorithm designed to prove the existence of God Detect asteroids and comets moving against a starfield Program a sentry gun to shoot your enemies and spare your friends Select landing sites for a Mars probe using real NASA maps Send unbreakable messages based on a book code Survive a zombie outbreak using data science Discover exoplanets and alien megastructures orbiting distant stars Test the hypothesis that we're all living in a computer simulation And more! If you're tired of learning the bare essentials of Python Programming with isolated snippets of code, you'll relish the relevant and geeky fun of Real-World Python!

Building Computer Vision Projects with OpenCV 4 and C++ - David Millán Escrivá 2019-03-26

Delve into practical computer vision and image processing projects and get up to speed with advanced object detection techniques and machine learning algorithms Key Features Discover best practices for engineering and maintaining OpenCV projects Explore

important deep learning tools for image classification Understand basic image matrix formats and filters Book Description OpenCV is one of the best open source libraries available and can help you focus on constructing complete projects on image processing, motion detection, and image segmentation. This Learning Path is your guide to understanding OpenCV concepts and algorithms through real-world examples and activities. Through various projects, you'll also discover how to use complex computer vision and machine learning algorithms and face detection to extract the maximum amount of information from images and videos. In later chapters, you'll learn to enhance your videos and images with optical flow analysis and background subtraction. Sections in the Learning Path will help you get to grips with text segmentation and recognition, in addition to guiding you through the basics of the new and improved deep learning modules. By the end of this Learning Path, you will have mastered commonly used computer vision techniques to build OpenCV projects from scratch. This Learning Path includes content from the following Packt books: Mastering OpenCV 4 - Third Edition by Roy Shilkrot and David Millán Escrivá Learn OpenCV 4 By Building Projects - Second Edition by David Millán Escrivá, Vinícius G. Mendonça, and Prateek Joshi What you will learn Stay up-to-date with algorithmic design approaches for complex computer vision tasks Work with OpenCV's most up-to-date API through various projects Understand 3D scene reconstruction and Structure from Motion (SfM) Study camera calibration and overlay augmented reality (AR) using the ArUco module Create CMake scripts to compile your C++ application Explore segmentation and feature extraction techniques Remove backgrounds from static scenes to identify moving objects for surveillance Work with new OpenCV functions to detect and recognize text with Tesseract Who this book is for If you are a software developer with a basic understanding of computer vision and image processing and want to develop interesting computer vision applications with OpenCV, this Learning Path is for you. Prior knowledge of C++ and familiarity with mathematical concepts will help you better understand the concepts in this Learning Path.

In-Depth Tutorials: Deep Learning Using Scikit-Learn, Keras, and TensorFlow with Python GUI - Vivian Siahaan 2021-06-05

BOOK 1: LEARN FROM SCRATCH MACHINE LEARNING WITH PYTHON GUI In this book, you will learn how to use NumPy, Pandas, OpenCV, Scikit-Learn and other libraries to how to plot graph and to process digital image. Then, you will learn how to classify features using Perceptron, Adaline, Logistic Regression (LR), Support Vector Machine (SVM), Decision Tree (DT), Random Forest (RF), and K-Nearest Neighbor (KNN) models. You will also learn how to extract features using Principal Component Analysis (PCA), Linear Discriminant Analysis (LDA), Kernel Principal Component Analysis (KPCA) algorithms and use them in machine learning. In Chapter 1, you will learn: Tutorial Steps To Create A Simple GUI Application, Tutorial Steps to Use Radio Button, Tutorial Steps to Group Radio Buttons, Tutorial Steps to Use CheckBox Widget, Tutorial Steps to Use Two CheckBox Groups, Tutorial Steps to Understand Signals and Slots, Tutorial Steps to Convert Data Types, Tutorial Steps to Use Spin Box Widget, Tutorial Steps to Use ScrollBar and Slider, Tutorial Steps to Use List Widget, Tutorial Steps to Select Multiple List Items in One List Widget and Display It in Another List Widget, Tutorial Steps to Insert Item into List Widget, Tutorial Steps to Use Operations on Widget List, Tutorial Steps to Use Combo Box, Tutorial Steps to Use Calendar Widget and Date Edit, and Tutorial Steps to Use Table Widget. In Chapter 2, you will learn: Tutorial Steps To Create A Simple Line Graph, Tutorial Steps To Create A Simple Line Graph in Python GUI, Tutorial Steps To Create A Simple Line Graph in Python GUI: Part 2, Tutorial Steps To Create Two or More Graphs in the Same Axis, Tutorial Steps To Create Two Axes in One Canvas, Tutorial Steps to Use Two Widgets, Tutorial Steps to Use Two Widgets, Each of Which Has Two Axes, Tutorial Steps to Use Axes With Certain Opacity Levels, Tutorial Steps to Choose Line Color From Combo Box, Tutorial Steps to Calculate Fast Fourier Transform, Tutorial Steps to Create GUI For FFT, Tutorial Steps to Create GUI For FFT With Some Other Input Signals, Tutorial Steps to Create GUI For Noisy Signal, Tutorial Steps to Create GUI For Noisy Signal Filtering, and Tutorial Steps To Create GUI For Wav

Signal Filtering. In Chapter 3, you will learn: Tutorial Steps To Convert RGB Image Into Grayscale, Tutorial Steps To Convert RGB Image Into YUV Image, Tutorial Steps To Convert RGB Image Into HSV Image, Tutorial Steps To Filter Image, Tutorial Steps To Display Image Histogram, Tutorial Steps To Display Filtered Image Histogram, Tutorial Steps To Filter Image With CheckBoxes, Tutorial Steps To Implement Image Thresholding, and Tutorial Steps To Implement Adaptive Image Thresholding. You will also learn: Tutorial Steps To Generate And Display Noisy Image, Tutorial Steps To Implement Edge Detection On Image, Tutorial Steps To Implement Image Segmentation Using Multiple Thresholding and K-Means Algorithm, Tutorial Steps To Implement Image Denoising, Tutorial Steps To Detect Face, Eye, and Mouth Using Haar Cascades, Tutorial Steps To Detect Face Using Haar Cascades with PyQt, Tutorial Steps To Detect Eye, and Mouth Using Haar Cascades with PyQt, Tutorial Steps To Extract Detected Objects, Tutorial Steps To Detect Image Features Using Harris Corner Detection, Tutorial Steps To Detect Image Features Using Shi-Tomasi Corner Detection, Tutorial Steps To Detect Features Using Scale-Invariant Feature Transform (SIFT), and Tutorial Steps To Detect Features Using Features from Accelerated Segment Test (FAST). In Chapter 4, In this tutorial, you will learn how to use Pandas, NumPy and other libraries to perform simple classification using perceptron and Adaline (adaptive linear neuron). The dataset used is Iris dataset directly from the UCI Machine Learning Repository. You will learn: Tutorial Steps To Implement Perceptron, Tutorial Steps To Implement Perceptron with PyQt, Tutorial Steps To Implement Adaline (ADaptive LInear NEuron), and Tutorial Steps To Implement Adaline with PyQt. In Chapter 5, you will learn how to use the scikit-learn machine learning library, which provides a wide variety of machine learning algorithms via a user-friendly Python API and to perform classification using perceptron, Adaline (adaptive linear neuron), and other models. The dataset used is Iris dataset directly from the UCI Machine Learning Repository. You will learn: Tutorial Steps To Implement Perceptron Using Scikit-Learn, Tutorial Steps To Implement Perceptron Using Scikit-Learn with PyQt, Tutorial Steps To Implement Logistic Regression Model, Tutorial Steps To Implement Logistic Regression Model with PyQt, Tutorial Steps To Implement Logistic Regression Model Using Scikit-Learn with PyQt, Tutorial Steps To Implement Support Vector Machine (SVM) Using Scikit-Learn, Tutorial Steps To Implement Decision Tree (DT) Using Scikit-Learn, Tutorial Steps To Implement Random Forest (RF) Using Scikit-Learn, and Tutorial Steps To Implement K-Nearest Neighbor (KNN) Using Scikit-Learn. In Chapter 6, you will learn how to use Pandas, NumPy, Scikit-Learn, and other libraries to implement different approaches for reducing the dimensionality of a dataset using different feature selection techniques. You will learn about three fundamental techniques that will help us to summarize the information content of a dataset by transforming it onto a new feature subspace of lower dimensionality than the original one. Data compression is an important topic in machine learning, and it helps us to store and analyze the increasing amounts of data that are produced and collected in the modern age of technology. You will learn the following topics: Principal Component Analysis (PCA) for unsupervised data compression, Linear Discriminant Analysis (LDA) as a supervised dimensionality reduction technique for maximizing class separability, Nonlinear dimensionality reduction via Kernel Principal Component Analysis (KPCA). You will learn: Tutorial Steps To Implement Principal Component Analysis (PCA), Tutorial Steps To Implement Principal Component Analysis (PCA) Using Scikit-Learn, Tutorial Steps To Implement Principal Component Analysis (PCA) Using Scikit-Learn with PyQt, Tutorial Steps To Implement Linear Discriminant Analysis (LDA), Tutorial Steps To Implement Linear Discriminant Analysis (LDA) with Scikit-Learn, Tutorial Steps To Implement Linear Discriminant Analysis (LDA) Using Scikit-Learn with PyQt, Tutorial Steps To Implement Kernel Principal Component Analysis (KPCA) Using Scikit-Learn, and Tutorial Steps To Implement Kernel Principal Component Analysis (KPCA) Using Scikit-Learn with PyQt. In Chapter 7, you will learn how to use Keras, Scikit-Learn, Pandas, NumPy and other libraries to perform prediction on handwritten digits using MNIST dataset. You will learn: Tutorial Steps To Load MNIST Dataset, Tutorial Steps To Load MNIST Dataset with PyQt, Tutorial Steps To

Implement Perceptron With PCA Feature Extractor on MNIST Dataset Using PyQt, Tutorial Steps To Implement Perceptron With LDA Feature Extractor on MNIST Dataset Using PyQt, Tutorial Steps To Implement Perceptron With KPCA Feature Extractor on MNIST Dataset Using PyQt, Tutorial Steps To Implement Logistic Regression (LR) Model With PCA Feature Extractor on MNIST Dataset Using PyQt, Tutorial Steps To Implement Logistic Regression (LR) Model With LDA Feature Extractor on MNIST Dataset Using PyQt, Tutorial Steps To Implement Logistic Regression (LR) Model With KPCA Feature Extractor on MNIST Dataset Using PyQt, Tutorial Steps To Implement , Tutorial Steps To Implement Support Vector Machine (SVM) Model With LDA Feature Extractor on MNIST Dataset Using PyQt, Tutorial Steps To Implement Support Vector Machine (SVM) Model With KPCA Feature Extractor on MNIST Dataset Using PyQt, Tutorial Steps To Implement Decision Tree (DT) Model With PCA Feature Extractor on MNIST Dataset Using PyQt, Tutorial Steps To Implement Decision Tree (DT) Model With LDA Feature Extractor on MNIST Dataset Using PyQt, Tutorial Steps To Implement Decision Tree (DT) Model With KPCA Feature Extractor on MNIST Dataset Using PyQt, Tutorial Steps To Implement Random Forest (RF) Model With PCA Feature Extractor on MNIST Dataset Using PyQt, Tutorial Steps To Implement Random Forest (RF) Model With LDA Feature Extractor on MNIST Dataset Using PyQt, Tutorial Steps To Implement Random Forest (RF) Model With KPCA Feature Extractor on MNIST Dataset Using PyQt, Tutorial Steps To Implement K-Nearest Neighbor (KNN) Model With PCA Feature Extractor on MNIST Dataset Using PyQt, Tutorial Steps To Implement K-Nearest Neighbor (KNN) Model With LDA Feature Extractor on MNIST Dataset Using PyQt, and Tutorial Steps To Implement K-Nearest Neighbor (KNN) Model With KPCA Feature Extractor on MNIST Dataset Using PyQt. BOOK 2: THE PRACTICAL GUIDES ON DEEP LEARNING USING SCIKIT-LEARN, KERAS, AND TENSORFLOW WITH PYTHON GUI In this book, you will learn how to use TensorFlow, Keras, Scikit-Learn, OpenCV, Pandas, NumPy and other libraries to implement deep learning on recognizing traffic signs using GTSRB dataset, detecting brain tumor using Brain Image MRI dataset, classifying gender, and recognizing facial expression using FER2013 dataset In Chapter 1, you will learn to create GUI applications to display line graph using PyQt. You will also learn how to display image and its histogram. In Chapter 2, you will learn how to use TensorFlow, Keras, Scikit-Learn, Pandas, NumPy and other libraries to perform prediction on handwritten digits using MNIST dataset with PyQt. You will build a GUI application for this purpose. In Chapter 3, you will learn how to perform recognizing traffic signs using GTSRB dataset from Kaggle. There are several different types of traffic signs like speed limits, no entry, traffic signals, turn left or right, children crossing, no passing of heavy vehicles, etc. Traffic signs classification is the process of identifying which class a traffic sign belongs to. In this Python project, you will build a deep neural network model that can classify traffic signs in image into different categories. With this model, you will be able to read and understand traffic signs which are a very important task for all autonomous vehicles. You will build a GUI application for this purpose. In Chapter 4, you will learn how to perform detecting brain tumor using Brain Image MRI dataset provided by Kaggle (<https://www.kaggle.com/navoneel/brain-mri-images-for-brain-tumor-detection>) using CNN model. You will build a GUI application for this purpose. In Chapter 5, you will learn how to perform classifying gender using dataset provided by Kaggle (<https://www.kaggle.com/cashutosh/gender-classification-dataset>) using MobileNetV2 and CNN models. You will build a GUI application for this purpose. In Chapter 6, you will learn how to perform recognizing facial expression using FER2013 dataset provided by Kaggle (<https://www.kaggle.com/nicolejyt/facialexpressionrecognition>) using CNN model. You will also build a GUI application for this purpose. BOOK 3: STEP BY STEP TUTORIALS ON DEEP LEARNING USING SCIKIT-LEARN, KERAS, AND TENSORFLOW WITH PYTHON GUI In this book, you will learn how to use TensorFlow, Keras, Scikit-Learn, OpenCV, Pandas, NumPy and other libraries to implement deep learning on classifying fruits, classifying cats/dogs, detecting furnitures, and classifying fashion. In Chapter 1, you will learn to create GUI applications to display line graph using PyQt. You will also learn how to display image and its histogram. Then,

you will learn how to use OpenCV, NumPy, and other libraries to perform feature extraction with Python GUI (PyQt). The feature detection techniques used in this chapter are Harris Corner Detection, Shi-Tomasi Corner Detector, and Scale-Invariant Feature Transform (SIFT). In Chapter 2, you will learn how to use TensorFlow, Keras, Scikit-Learn, OpenCV, Pandas, NumPy and other libraries to perform classifying fruits using Fruits 360 dataset provided by Kaggle (<https://www.kaggle.com/moltean/fruits/code>) using Transfer Learning and CNN models. You will build a GUI application for this purpose. In Chapter 3, you will learn how to use TensorFlow, Keras, Scikit-Learn, OpenCV, Pandas, NumPy and other libraries to perform classifying cats/dogs using dataset provided by Kaggle (<https://www.kaggle.com/chetankv/dogs-cats-images>) using CNN with Data Generator. You will build a GUI application for this purpose. In Chapter 4, you will learn how to use TensorFlow, Keras, Scikit-Learn, OpenCV, Pandas, NumPy and other libraries to perform detecting furnitures using Furniture Detector dataset provided by Kaggle (<https://www.kaggle.com/akkithetechie/furniture-detector>) using VGG16 model. You will build a GUI application for this purpose. In Chapter 5, you will learn how to use TensorFlow, Keras, Scikit-Learn, OpenCV, Pandas, NumPy and other libraries to perform classifying fashion using Fashion MNIST dataset provided by Kaggle (<https://www.kaggle.com/zalando-research/fashionmnist/code>) using CNN model. You will build a GUI application for this purpose.

BOOK 4: Project-Based Approach On DEEP LEARNING Using Scikit-Learn, Keras, And TensorFlow with Python GUI In this book, implement deep learning on detecting vehicle license plates, recognizing sign language, and detecting surface crack using TensorFlow, Keras, Scikit-Learn, OpenCV, Pandas, NumPy and other libraries. In Chapter 1, you will learn how to use TensorFlow, Keras, Scikit-Learn, OpenCV, Pandas, NumPy and other libraries to perform detecting vehicle license plates using Car License Plate Detection dataset provided by Kaggle (<https://www.kaggle.com/andrewmvd/car-plate-detection/download>). In Chapter 2, you will learn how to use TensorFlow, Keras, Scikit-Learn, OpenCV, Pandas, NumPy and other libraries to perform sign language recognition using Sign Language Digits Dataset provided by Kaggle (<https://www.kaggle.com/ardamavi/sign-language-digits-dataset/download>). In Chapter 3, you will learn how to use TensorFlow, Keras, Scikit-Learn, OpenCV, Pandas, NumPy and other libraries to perform detecting surface crack using Surface Crack Detection provided by Kaggle (<https://www.kaggle.com/arunrk7/surface-crack-detection/download>).

BOOK 5: Hands-On Guide To IMAGE CLASSIFICATION Using Scikit-Learn, Keras, And TensorFlow with PYTHON GUI In this book, implement deep learning-based image classification on detecting face mask, classifying weather, and recognizing flower using TensorFlow, Keras, Scikit-Learn, OpenCV, Pandas, NumPy and other libraries. In Chapter 1, you will learn how to use TensorFlow, Keras, Scikit-Learn, OpenCV, Pandas, NumPy and other libraries to perform detecting face mask using Face Mask Detection Dataset provided by Kaggle (<https://www.kaggle.com/omkargurav/face-mask-dataset/download>). In Chapter 2, you will learn how to use TensorFlow, Keras, Scikit-Learn, OpenCV, Pandas, NumPy and other libraries to perform how to classify weather using Multi-class Weather Dataset provided by Kaggle (<https://www.kaggle.com/pratik2901/multiclass-weather-dataset/download>). In Chapter 3, you will learn how to use TensorFlow, Keras, Scikit-Learn, OpenCV, Pandas, NumPy and other libraries to perform how to recognize flower using Flowers Recognition dataset provided by Kaggle (<https://www.kaggle.com/alxmamaev/flowers-recognition/download>).

BOOK 6: Step by Step Tutorial IMAGE CLASSIFICATION Using Scikit-Learn, Keras, And TensorFlow with PYTHON GUI In this book, implement deep learning-based image classification on classifying monkey species, recognizing rock, paper, and scissor, and classify airplane, car, and ship using TensorFlow, Keras, Scikit-Learn, OpenCV, Pandas, NumPy and other libraries. In Chapter 1, you will learn how to use TensorFlow, Keras, Scikit-Learn, OpenCV, Pandas, NumPy and other libraries to perform how to classify monkey species using 10 Monkey Species dataset provided by Kaggle (<https://www.kaggle.com/slothkong/10-monkey-species/download>). In Chapter 2, you will learn how to use

TensorFlow, Keras, Scikit-Learn, OpenCV, Pandas, NumPy and other libraries to perform how to recognize rock, paper, and scissor using 10 Monkey Species dataset provided by Kaggle (<https://www.kaggle.com/sanikamal/rock-paper-scissors-dataset/download>). In Chapter 3, you will learn how to use TensorFlow, Keras, Scikit-Learn, OpenCV, Pandas, NumPy and other libraries to perform how to classify airplane, car, and ship using Multiclass-image-dataset-airplane-car-ship dataset provided by Kaggle (<https://www.kaggle.com/abtabm/multiclassimagedatasetairplanecar>).

Raspberry Pi 3 Home Automation Projects - Shantanu Bhadoria 2017-11-06

"With futuristic homes on the rise, learn to control and automate the living space with intriguing IoT projects." About This Book Build exciting (six) end-to-end home automation projects with Raspberry Pi 3, Seamlessly communicate and control your existing devices and build your own home automation system, Automate tasks in your home through projects that are reliable and fun Who This Book Is For This book is for all those who are excited about building home automation systems with Raspberry Pi 3. It's also for electronic hobbyists and developers with some knowledge of electronics and programming. What You Will Learn Integrate different embedded microcontrollers and development boards like Arduino, ESP8266, Particle Photon and Raspberry Pi 3, creating real life solutions for day to day tasks and home automation Create your own magic mirror that lights up with useful information as you walk up to it Create a system that intelligently decides when to water your garden and then goes ahead and waters it for you Use the Wi-fi enabled Adafruit ESP8266 Huzzah to create your own networked festive display lights Create a simple machine learning application and build a parking automation system using Raspberry Pi Learn how to work with AWS cloud services and connect your home automation to the cloud Learn how to work with Windows IoT in Raspberry Pi 3 and build your own Windows IoT Face Recognition door locking system In Detail Raspberry Pi 3 Home Automation Projects addresses the challenge of applying real-world projects to automate your house using Raspberry Pi 3 and Arduino. You will learn how to customize and program the Raspberry Pi 3 and Arduino-based boards in several home automation projects around your house, in order to develop home devices that will really rejuvenate your home. This book aims to help you integrate different microcontrollers like Arduino, ESP8266 Wi-Fi module, Particle Photon and Raspberry Pi 3 into the real world, taking the best of these boards to develop some exciting home automation projects. You will be able to use these projects in everyday tasks, thus making life easier and comfortable. We will start with an interesting project creating a Raspberry Pi-Powered smart mirror and move on to Automated Gardening System, which will help you build a simple smart gardening system with plant-sensor devices and Arduino to keep your garden healthy with minimal effort. You will also learn to build projects such as CheerLights into a holiday display, a project to erase parking headaches with OpenCV and Raspberry Pi 3, create Netflix's "The Switch" for the living room and lock down your house like Fort Knox with a Windows IoT face recognition-based door lock system. By the end of the book, you will be able to build and automate the living space with intriguing IoT projects and bring a new degree of interconnectivity to your world. Style and approach End to end home automation projects with Raspberry Pi 3.

Learn OpenCV 4 by Building Projects - David Millán Escrivá 2018-11-30

Explore OpenCV 4 to create visually appealing cross-platform computer vision applications Key Features Understand basic OpenCV 4 concepts and algorithms Grasp advanced OpenCV techniques such as 3D reconstruction, machine learning, and artificial neural networks Work with Tesseract OCR, an open-source library to recognize text in images Book Description OpenCV is one of the best open source libraries available, and can help you focus on constructing complete projects on image processing, motion detection, and image segmentation. Whether you're completely new to computer vision, or have a basic understanding of its concepts, Learn OpenCV 4 by Building Projects - Second edition will be your guide to understanding OpenCV concepts and algorithms through real-world examples and projects. You'll begin with the installation of OpenCV and the

basics of image processing. Then, you'll cover user interfaces and get deeper into image processing. As you progress through the book, you'll learn complex computer vision algorithms and explore machine learning and face detection. The book then guides you in creating optical flow video analysis and background subtraction in complex scenes. In the concluding chapters, you'll also learn about text segmentation and recognition and understand the basics of the new and improved deep learning module. By the end of this book, you'll be familiar with the basics of Open CV, such as matrix operations, filters, and histograms, and you'll have mastered commonly used computer vision techniques to build OpenCV projects from scratch. What you will learn

Install OpenCV 4 on your operating system
Create CMake scripts to compile your C++ application
Understand basic image matrix formats and filters
Explore segmentation and feature extraction techniques
Remove backgrounds from static scenes to identify moving objects for surveillance
Employ various techniques to track objects in a live video
Work with new OpenCV functions for text detection and recognition with Tesseract
Get acquainted with important deep learning tools for image classification

Who this book is for
If you are a software developer with a basic understanding of computer vision and image processing and want to develop interesting computer vision applications with OpenCV, Learn OpenCV 4 by Building Projects for you. Prior knowledge of C++ will help you understand the concepts covered in this book.

Mastering OpenCV 3 - Second Edition - Daniel Lélis Baggio 2017-04-28

Practical Computer Vision Projects
About This Book* Updated for OpenCV 3, this book covers new features that will help you unlock the full potential of OpenCV 3* Written by a team of 7 experts, each chapter explores a new aspect of OpenCV to help you make amazing computer-vision aware applications* Project-based approach with each chapter being a complete tutorial, showing you how to apply OpenCV to solve complete problems
Who This Book Is For
This book is for those who have a basic knowledge of OpenCV and are competent C++ programmers. You need to have an understanding of some of the more theoretical/mathematical concepts, as we move quite quickly throughout the book.
What You Will Learn* Execute basic image processing operations and cartoonify an image* Build an OpenCV project natively with Raspberry Pi and cross-compile it for Raspberry Pi.
text* Extend the natural feature tracking algorithm to support the tracking of multiple image targets on a video* Use OpenCV 3's new 3D visualization framework to illustrate the 3D scene geometry* Create an application for Automatic Number Plate Recognition (ANPR) using a support vector machine and Artificial Neural Networks* Train and predict pattern-recognition algorithms to decide whether an image is a number plate* Use POSIT for the six degrees of freedom head pose* Train a face recognition database using deep learning and recognize faces from that database
In Detail
As we become more capable of handling data in every kind, we are becoming more reliant on visual input and what we can do with those self-driving cars, face recognition, and even augmented reality applications and games. This is all powered by Computer Vision. This book will put you straight to work in creating powerful and unique computer vision applications. Each chapter is structured around a central project and deep dives into an important aspect of OpenCV such as facial recognition, image target tracking, making augmented reality applications, the 3D visualization framework, and machine learning. You'll learn how to make AI that can remember and use neural networks to help your applications learn. By the end of the book, you will have created various working prototypes with the projects in the book and will be well versed with the new features of OpenCV3.
Style and approach
This book takes a project-based approach and helps you learn about the new features by putting them to work by implementing them in your own projects.

Progress in Computing, Analytics and Networking - Himansu Das 2020-03-26

This book focuses on new and original research ideas and findings in three broad areas: computing, analytics, and networking and their potential applications in the various domains of engineering - an emerging, interdisciplinary area in which a wide range of theories and methodologies are being investigated and developed

to tackle complex and challenging real-world problems. The book also features keynote presentations and papers from the International Conference on Computing Analytics and Networking (ICCAN 2019), which offers an open forum for scientists, researchers and technocrats in academia and industry from around the globe to present and share state-of-the-art concepts, prototypes, and innovative research ideas in diverse fields. Providing inspiration for postgraduate students and young researchers working in the field of computer science & engineering, the book also discusses hardware technologies and future communication technologies, making it useful for those in the field of electronics.

Pattern Recognition - Jesús Ariel Carrasco-Ochoa 2019-06-19

This book constitutes the proceedings of the 11th Mexican Conference on Pattern Recognition, MCPR 2019, held in Querétaro, Mexico, in June 2019. The 40 papers presented in this volume were carefully reviewed and selected from 86 submissions. They were organized in topical sections named: artificial intelligence techniques and recognition; computer vision; industrial and medical applications of pattern recognition; image processing and analysis; pattern recognition techniques; signal processing and analysis; natural language, and processing and recognition.

Head First Python - Paul Barry 2016-11-21

Want to learn the Python language without slogging your way through how-to manuals? With Head First Python, you'll quickly grasp Python's fundamentals, working with the built-in data structures and functions. Then you'll move on to building your very own webapp, exploring database management, exception handling, and data wrangling. If you're intrigued by what you can do with context managers, decorators, comprehensions, and generators, it's all here. This second edition is a complete learning experience that will help you become a bonafide Python programmer in no time. Why does this book look so different? Based on the latest research in cognitive science and learning theory, Head First Python uses a visually rich format to engage your mind, rather than a text-heavy approach that puts you to sleep. Why waste your time struggling with new concepts? This multi-sensory learning experience is designed for the way your brain really works.

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).

Modelling in Engineering 2020: Applied Mechanics - Arkadiusz Mężyk 2021-02-12

This book includes the outcomes of the 59th Symposium "Modelowanie w Mechanice" (Engineering Modelling in Mechanics) held in Ustroń from 22 February to 26 February 2020. The International Conference has an over 58-year-old history and is organized by the Department of Theoretical and Applied Mechanics of Silesian University of Technology under the patronage of the Polish Society of Theoretical and Applied Mechanics, Gliwice Branch. Subjects of the conference are modelling of mechatronic systems, machinery dynamics, control systems, sensitivity analysis and optimization, numerical modelling and experimental methods in mechanics, biomechanics, heat flow analysis, fluid mechanics, etc. The papers are dealing with interdisciplinary problems in which mechanical phenomena are of decisive importance. The potential reader of this book will find their set of papers concentrated on the use of computer-aided design, virtual modelling, numerical simulations, fast prototyping and experimental tests of mechanical systems. It is an area of versatile and interdisciplinary research trends with one of the mainstreams focusing on applied mechanics.

Data Engineering for Smart Systems - Priyadarsi Nanda 2021-11-13

This book features original papers from the 3rd International Conference on Smart IoT Systems: Innovations and Computing (SSIC 2021), organized by Manipal University, Jaipur, India, during January 22-23, 2021. It discusses scientific works related to data engineering in the context of computational collective intelligence consisted of interaction between smart devices for smart environments and interactions. Thanks to the high-quality content and the broad range of

topics covered, the book appeals to researchers pursuing advanced studies.

Progress in Pattern Recognition, Image Analysis, Computer Vision, and Applications - Eduardo Bayro-Corrochano 2014-10-23

This book constitutes the refereed proceedings of the 19th Iberoamerican Congress on Pattern Recognition, CIARP 2014, held in Puerto Vallarta, Jalisco, Mexico, in November 2014. The 115 papers presented were carefully reviewed and selected from 160 submissions. The papers are organized in topical sections on image coding, processing and analysis; segmentation, analysis of shape and texture; analysis of signal, speech and language; document processing and recognition; feature extraction, clustering and classification; pattern recognition and machine learning; neural networks for pattern recognition; computer vision and robot vision; video segmentation and tracking.

Deep Learning Approach for Natural Language Processing, Speech, and Computer Vision - L. Ashok Kumar 2023-05-22

Deep Learning Approach for Natural Language Processing, Speech, and Computer Vision provides an overview of general deep learning methodology and its applications of natural language processing (NLP), speech and computer vision tasks. It simplifies and presents the concepts of deep learning in a comprehensive manner, with suitable, full-fledged examples of deep learning models, with an aim to bridge the gap between the theory and the applications using case studies with code, experiments, and supporting analysis. Features: Covers latest developments in deep learning techniques as applied to audio analysis, computer vision, and NLP Introduces contemporary applications of deep learning techniques as applied to audio, textual, and visual processing Discovers deep learning frameworks and libraries for NLP, speech and computer vision in Python Gives insights into using the tools and libraries in Python for real-world applications. Provides easily accessible tutorials, and real-world case studies with codes to provide hands-on experience. This book is aimed at researchers and graduate students in computer engineering, image, speech, and text processing.

Algorithms for Image Processing and Computer Vision - J. R. Parker 2010-11-29

A cookbook of algorithms for common image processing applications Thanks to advances in computer hardware and software, algorithms have been developed that support sophisticated image processing without requiring an extensive background in mathematics. This bestselling book has been fully updated with the newest of these, including 2D vision methods in content-based searches and the use of graphics cards as image processing computational aids. It's an ideal reference for software engineers and developers, advanced programmers, graphics programmers, scientists, and other specialists who require highly specialized image processing. Algorithms now exist for a wide variety of sophisticated image processing applications required by software engineers and developers, advanced programmers, graphics programmers, scientists, and related specialists This bestselling book has been completely updated to include the latest algorithms, including 2D vision methods in content-based searches, details on modern classifier methods, and graphics cards used as image processing computational aids Saves hours of mathematical calculating by using distributed processing and GPU programming, and gives non-mathematicians the shortcuts needed to program relatively sophisticated applications. Algorithms for Image Processing and Computer Vision, 2nd Edition provides the tools to speed development of image processing applications.

Intelligent System Design - Vikrant Bhateja 2022-10-27

This book presents a collection of high-quality, peer-reviewed research papers from the 7th International Conference on Information System Design and Intelligent Applications (India 2022), held at BVRIT Hyderabad College of Engineering for Women, Hyderabad, Telangana, India, from February 25 to 26, 2022. It covers a wide range of topics in computer science and information technology, including data mining and data warehousing, high-performance computing, parallel and distributed computing, computational intelligence, soft computing, big data, cloud computing, grid computing and cognitive computing.

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

Updated for OpenCV 4 and Python 3, this book covers the

latest on depth cameras, 3D tracking, augmented reality, and deep neural networks, helping you solve real-world computer vision problems with practical code Key Features Build powerful computer vision applications in concise code with OpenCV 4 and Python 3 Learn the fundamental concepts of image processing, object classification, and 2D and 3D tracking Train, use, and understand machine learning models such as Support Vector Machines (SVMs) and neural networks Book Description Computer vision is a rapidly evolving science, encompassing diverse applications and techniques. This book will not only help those who are getting started with computer vision but also experts in the domain. You'll be able to put theory into practice by building apps with OpenCV 4 and Python 3. You'll start by understanding OpenCV 4 and how to set it up with Python 3 on various platforms. Next, you'll learn how to perform basic operations such as reading, writing, manipulating, and displaying still images, videos, and camera feeds. From taking you through image processing, video analysis, and depth estimation and segmentation, to helping you gain practice by building a GUI app, this book ensures you'll have opportunities for hands-on activities. Next, you'll tackle two popular challenges: face detection and face recognition. You'll also learn about object classification and machine learning concepts, which will enable you to create and use object detectors and classifiers, and even track objects in movies or video camera feed. Later, you'll develop your skills in 3D tracking and augmented reality. Finally, you'll cover ANNs and DNNs, learning how to develop apps for recognizing handwritten digits and classifying a person's gender and age. By the end of this book, you'll have the skills you need to execute real-world computer vision projects. What you will learn Install and familiarize yourself with OpenCV 4's Python 3 bindings Understand image processing and video analysis basics Use a depth camera to distinguish foreground and background regions Detect and identify objects, and track their motion in videos Train and use your own models to match images and classify objects Detect and recognize faces, and classify their gender and age Build an augmented reality application to track an image in 3D Work with machine learning models, including SVMs, artificial neural networks (ANNs), and deep neural networks (DNNs) Who this book is for If you are interested in learning computer vision, machine learning, and OpenCV in the context of practical real-world applications, then this book is for you. This OpenCV book will also be useful for anyone getting started with computer vision as well as experts who want to stay up-to-date with OpenCV 4 and Python 3. Although no prior knowledge of image processing, computer vision or machine learning is required, familiarity with basic Python programming is a must.

Mastering OpenCV 4 - Roy Shilkrot 2018-12-27

Work on practical computer vision projects covering advanced object detector techniques and modern deep learning and machine learning algorithms Key Features Learn about the new features that help unlock the full potential of OpenCV 4 Build face detection applications with a cascade classifier using face landmarks Create an optical character recognition (OCR) model using deep learning and convolutional neural networks Book Description Mastering OpenCV, now in its third edition, targets computer vision engineers taking their first steps toward mastering OpenCV. Keeping the mathematical formulations to a solid but bare minimum, the book delivers complete projects from ideation to running code, targeting current hot topics in computer vision such as face recognition, landmark detection and pose estimation, and number recognition with deep convolutional networks. You'll learn from experienced OpenCV experts how to implement computer vision products and projects both in academia and industry in a comfortable package. You'll get acquainted with API functionality and gain insights into design choices in a complete computer vision project. You'll also go beyond the basics of computer vision to implement solutions for complex image processing projects. By the end of the book, you will have created various working prototypes with the help of projects in the book and be well versed with the new features of OpenCV4. What you will learn Build real-world computer vision problems with working OpenCV code samples Uncover best practices in engineering and maintaining OpenCV projects Explore algorithmic design approaches for complex computer

vision tasks Work with OpenCV's most updated API (v4.0.0) through projects Understand 3D scene reconstruction and Structure from Motion (SfM) Study camera calibration and overlay AR using the ArUco Module Who this book is for This book is for those who have a basic knowledge of OpenCV and are competent C++ programmers. You need to have an understanding of some of the more theoretical/mathematical concepts, as we move quite quickly throughout the book.

Mastering OpenCV 3 - Daniel Lelis Baggio 2017-04-28
Practical Computer Vision Projects About This Book Updated for OpenCV 3, this book covers new features that will help you unlock the full potential of OpenCV 3 Written by a team of 7 experts, each chapter explores a new aspect of OpenCV to help you make amazing computer-vision aware applications Project-based approach with each chapter being a complete tutorial, showing you how to apply OpenCV to solve complete problems Who This Book Is For This book is for those who have a basic knowledge of OpenCV and are competent C++ programmers. You need to have an understanding of some of the more theoretical/mathematical concepts, as we move quite quickly throughout the book. What You Will Learn Execute basic image processing operations and cartoonify an image Build an OpenCV project natively with Raspberry Pi and cross-compile it for Raspberry Pi. text Extend the natural feature tracking algorithm to support the tracking of multiple image targets on a video Use OpenCV 3's new 3D visualization framework to illustrate the 3D scene geometry Create an application for Automatic Number Plate Recognition (ANPR) using a support vector machine and Artificial Neural Networks Train and predict pattern-recognition algorithms to decide whether an image is a number plate Use POSIT for the six degrees of freedom head pose Train a face recognition database using deep learning and recognize faces from that database In Detail As we become more capable of handling data in every kind, we are becoming more reliant on visual input and what we can do with those self-driving cars, face recognition, and even augmented reality applications and games. This is all powered by Computer Vision. This book will put you straight to work in creating powerful and unique computer vision applications. Each chapter is structured around a central project and deep dives into an important aspect of OpenCV such as facial recognition, image target tracking, making augmented reality applications, the 3D visualization framework, and machine learning. You'll learn how to make AI that can remember and use neural networks to help your applications learn. By the end of the book, you will have created various working prototypes with the projects in the book and will be well versed with the new features of OpenCV3. Style and approach This book takes a project-based approach and helps you learn about the new features by putting them to work by implementing them in your own projects.

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 Robotics Using Python** - Lentin Joseph 2015-05-27

If you are an engineer, a researcher, or a hobbyist, and you are interested in robotics and want to build your own robot, this book is for you. Readers are assumed to be new to robotics but should have experience with Python.

THREE BOOKS IN ONE: Deep Learning Using SCIKIT-LEARN, KERAS, and TENSORFLOW with Python GUI - Vivian Siahaan 2021-05-20

BOOK 1: THE PRACTICAL GUIDES ON DEEP LEARNING USING SCIKIT-LEARN, KERAS, AND TENSORFLOW WITH PYTHON GUI In this book, you will learn how to use TensorFlow, Keras, Scikit-Learn, OpenCV, Pandas, NumPy and other libraries to implement deep learning on recognizing traffic signs using GTSRB dataset, detecting brain tumor using Brain Image MRI dataset, classifying gender, and recognizing facial expression using FER2013 dataset In Chapter 1, you will learn to create GUI applications to display line graph using PyQt. You will also learn how to display image and its histogram. In Chapter 2, you will learn how to use TensorFlow, Keras, Scikit-Learn, Pandas, NumPy and other libraries to perform prediction on handwritten digits using MNIST dataset with PyQt. You will build a GUI application for this purpose. In Chapter 3, you will learn how to perform recognizing traffic signs using GTSRB dataset from Kaggle. There are several different types of traffic signs like speed limits, no entry, traffic signals, turn left or right, children crossing, no passing of heavy vehicles, etc. Traffic signs classification is the process of identifying which class a traffic sign belongs to. In this Python project, you will build a deep neural network model that can classify traffic signs in image into different categories. With this model, you will be able to read and understand traffic signs which are a very important task for all autonomous vehicles. You will build a GUI application for this purpose. In Chapter 4, you will learn how to perform detecting brain tumor using Brain Image MRI dataset provided by Kaggle (<https://www.kaggle.com/navoneel/brain-mri-images-for-brain-tumor-detection>) using CNN model. You will build a GUI application for this purpose. In Chapter 5, you will learn how to perform classifying gender using dataset provided by Kaggle

(<https://www.kaggle.com/cashutosh/gender-classification-dataset>) using MobileNetV2 and CNN models. You will build a GUI application for this purpose. In Chapter 6, you will learn how to perform recognizing facial expression using FER2013 dataset provided by Kaggle (<https://www.kaggle.com/nicolejyt/facialexpressionrecognition>) using CNN model. You will also build a GUI application for this purpose. BOOK 2: STEP BY STEP TUTORIALS ON DEEP LEARNING USING SCIKIT-LEARN, KERAS, AND TENSORFLOW WITH PYTHON GUI In this book, you will learn how to use TensorFlow, Keras, Scikit-Learn, OpenCV, Pandas, NumPy and other libraries to implement deep learning on classifying fruits, classifying cats/dogs, detecting furnitures, and classifying fashion. In Chapter 1, you will learn to create GUI applications to display line graph using PyQt. You will also learn how to display image and its histogram. Then, you will learn how to use OpenCV, NumPy, and other libraries to perform feature extraction with Python GUI (PyQt). The feature detection techniques used in this

chapter are Harris Corner Detection, Shi-Tomasi Corner Detector, and Scale-Invariant Feature Transform (SIFT). In Chapter 2, you will learn how to use TensorFlow, Keras, Scikit-Learn, OpenCV, Pandas, NumPy and other libraries to perform classifying fruits using Fruits 360 dataset provided by Kaggle (<https://www.kaggle.com/moltean/fruits/code>) using Transfer Learning and CNN models. You will build a GUI application for this purpose. In Chapter 3, you will learn how to use TensorFlow, Keras, Scikit-Learn, OpenCV, Pandas, NumPy and other libraries to perform classifying cats/dogs using dataset provided by Kaggle (<https://www.kaggle.com/chetankv/dogs-cats-images>) using Using CNN with Data Generator. You will build a GUI application for this purpose. In Chapter 4, you will learn how to use TensorFlow, Keras, Scikit-Learn, OpenCV, Pandas, NumPy and other libraries to perform detecting furnitures using Furniture Detector dataset provided by Kaggle (<https://www.kaggle.com/akkithetechie/furniture-detector>) using VGG16 model. You will build a GUI application for this purpose. In Chapter 5, you will learn how to use TensorFlow, Keras, Scikit-Learn, OpenCV, Pandas, NumPy and other libraries to perform classifying fashion using Fashion MNIST dataset provided by Kaggle (<https://www.kaggle.com/zalando-research/fashionmnist/code>) using CNN model. You will build a GUI application for this purpose.

BOOK 3: PROJECT-BASED APPROACH ON DEEP LEARNING USING SCIKIT-LEARN, KERAS, AND TENSORFLOW WITH PYTHON GUI In this book, implement deep learning on detecting vehicle license plates, recognizing sign language, and detecting surface crack using TensorFlow, Keras, Scikit-Learn, OpenCV, Pandas, NumPy and other libraries. In Chapter 1, you will learn how to use TensorFlow, Keras, Scikit-Learn, OpenCV, Pandas, NumPy and other libraries to perform detecting vehicle license plates using Car License Plate Detection dataset provided by Kaggle (<https://www.kaggle.com/andrewmvd/car-plate-detection/download>). In Chapter 2, you will learn how to use TensorFlow, Keras, Scikit-Learn, OpenCV, Pandas, NumPy and other libraries to perform sign language recognition using Sign Language Digits Dataset provided by Kaggle (<https://www.kaggle.com/ardamavi/sign-language-digits-dataset/download>). In Chapter 3, you will learn how to use TensorFlow, Keras, Scikit-Learn, OpenCV, Pandas, NumPy and other libraries to perform detecting surface crack using Surface Crack Detection provided by Kaggle (<https://www.kaggle.com/arunrk7/surface-crack-detection/download>).

A Practical Introduction to Computer Vision with OpenCV
- Kenneth Dawson-Howe 2014-03-20

Explains the theory behind basic computer vision and provides a bridge from the theory to practical implementation using the industry standard OpenCV libraries. Computer Vision is a rapidly expanding area and it is becoming progressively easier for developers to make use of this field due to the ready availability of high quality libraries (such as OpenCV2). This text is intended to facilitate the practical use of computer vision with the goal being to bridge the gap between the theory and the practical implementation of computer vision. The book will explain how to use the relevant OpenCV library routines and will be accompanied by a full working program including the code snippets from the text. This textbook is a heavily illustrated, practical introduction to an exciting field, the applications of which are becoming almost ubiquitous. We are now surrounded by cameras, for example cameras on computers & tablets/ cameras built into our mobile phones/ cameras in games consoles; cameras imaging difficult modalities (such as ultrasound, X-ray, MRI) in hospitals, and surveillance cameras. This book is concerned with helping the next generation of computer developers to make use of all these images in order to develop systems which are more intuitive and interact with us in more intelligent ways. Explains the theory behind basic computer vision and provides a bridge from the theory to practical implementation using the industry standard OpenCV libraries. Offers an introduction to computer vision, with enough theory to make clear how the various algorithms work but with an emphasis on practical programming issues. Provides enough material for a one semester course in computer vision at senior undergraduate and Masters levels. Includes the basics of cameras and images and image processing to remove noise, before moving on to topics such as image histogramming;

binary imaging; video processing to detect and model moving objects; geometric operations & camera models; edge detection; features detection; recognition in images. Contains a large number of vision application problems to provide students with the opportunity to solve real problems. Images or videos for these problems are provided in the resources associated with this book which include an enhanced eBook.

SEVEN BOOKS IN ONE: Sinyal Digital, Citra Digital, Machine Learning, Deep Learning, dan Data Science dengan Python GUI - Vivian Siahaan 2021-07-24

BUKU 1: Konsep dan Implementasi Pemrograman Python Buku ini merupakan buku teks pemrograman komputer menggunakan Python yang difokuskan untuk pembelajaran efektif. Sengaja dirancang untuk pelbagai tingkat ketertarikan dan kemampuan pembelajar, buku ini cocok untuk siswa SMA/SMK, mahasiswa, insinyur, dan bahkan peneliti dalam berbagai disiplin ilmu. Tidak ada pengalaman pemrograman yang diperlukan, dan hanya sedikit kemampuan aljabar tingkat sekolah menengah atas yang diperlukan. Buku ini memang dirancang untuk mengambil rute tradisional, dengan lebih dahulu menekankan sintaksis-sintaksis dasar, struktur-struktur kendali, fungsi, dekomposisi prosedural, dan struktur data built-in seperti list, set, dan kamus (dictionary). Panduan langkah-demi-langkah di dalamnya diharapkan bisa membantu kepercayaan diri pembaca untuk menjadi programmer yang bisa menyelesaikan permasalahan-permasalahan pemrograman. Sejumlah contoh disediakan untuk mendemonstrasikan bagaimana menerapkan konsep-konsep yang telah disajikan terhadap sejumlah tantangan pemrograman. Pada Bab 1, Anda akan diajari mengenal IDE Spyder untuk memprogram Python dan mengetahui sintaksis dasar dari program sederhana Python. Pada Bab 2, Anda akan belajar: Mendefinisikan dan menggunakan variabel dan konstanta; Memahami sejumlah watak dan keterbatasan bilangan integer (bilangan bulat) dan titik-mengambang (bilangan pecahan); Memahami pentingnya komentar dan tata letak kode; Menulis ekspresi aritmatik dan statemen penugasan; Menciptakan program yang membaca dan memproses masukan, dan menampilkan hasilnya; Bagaimana menggunakan string Python; Menciptakan program grafika menggunakan sejumlah bangun dasar dan teks. Pada Bab 3, Anda akan belajar: Mengimplementasikan keputusan menggunakan statemen if; Membandingkan bilangan integer, titik-mengambang, dan string; Menuliskan statemen menggunakan ekspresi Boolean; Memvalidasi masukan user. Pada Bab 4, Anda akan belajar: Mengimplementasikan loop while dan for; Menjadi familiar dengan algoritma-algoritma yang melibatkan loop; Memahami loop bersarang; Memproses string. Pada Bab 5, Anda akan belajar: Bagaimana mengimplementasikan fungsi; Menjadi familiar dengan konsep pelewatan parameter; Mengembangkan strategi pendekomposisian pekerjaan kompleks menjadi pekerjaan-pekerjaan yang lebih mudah; Mampu menentukan skop variabel. Pada Bab 6, Anda akan belajar: Mengumpulkan elemen-elemen menggunakan list; Menggunakan loop for untuk menjelajah list; Menggunakan sejumlah algoritma umum untuk memproses list; Menggunakan list dengan fungsi; Bekerja dengan tabel data. Pada Bab 7, Anda akan belajar: Membangun dan menggunakan kontainer set; Menggunakan operasi-operasi set untuk memproses data; Membangun dan menggunakan kontainer dictionary; Menggunakan dictionary untuk tabel; Menggunakan struktur kompleks.

BUKU 2: SINYAL DAN CITRA DIGITAL dengan PYTHON GUI Buku ini merupakan versi bahasa Indonesia dari buku kami yang berjudul "LEARN FROM SCRATCH SIGNAL AND IMAGE PROCESSING WITH PYTHON GUI". Anda bisa mengaksesnya di Amazon maupun di Google Books. Pada buku ini, Anda akan belajar bagaimana menggunakan OpenCV, NumPy dan sejumlah pustaka lain untuk melakukan pemrosesan sinyal, pemrosesan citra, deteksi objek, dan ekstraksi fitur dengan memanfaatkan Python GUI (PyQt). Anda akan belajar cara memfilter sinyal, mendeteksi tepi dan segmen, dan menekan derau pada citra dengan memanfaatkan PyQt. Anda juga akan belajar cara mendeteksi objek (wajah, mata, dan mulut) menggunakan Haar Cascades dan cara mendeteksi fitur pada citra menggunakan Harris Corner Detection, Shi-Tomasi Corner Detector, Scale-Invariant Feature Transform (SIFT), dan Features from Accelerated Uji Segmen (FAST). Pada bab 1, Anda akan mempelajari secara langkah demi langkah: membuat aplikasi gui sederhana; menggunakan tombol radio; mengelompokkan tombol radio; menggunakan widget kotak centang; menggunakan dua grup kotak centang; memahami sinyal dan slot; mengonversi jenis data; menggunakan widget spin box; menggunakan scrollbar dan slider; menggunakan list widget; menggunakan kotak

kombo; dan menggunakan widget Table. Pada bab 2, Anda akan mempelajari secara langkah demi langkah: membuat grafik garis sederhana; membuat grafik garis sederhana dengan python gui; membuat grafik garis sederhana dengan python gui: bagian 2; membuat dua atau lebih banyak grafik di sumbu yang sama; membuat dua sumbu dalam satu kanvas; menggunakan dua widget; menggunakan dua widget, masing-masing memiliki dua sumbu; menggunakan sumbu dengan tingkat opacity tertentu; memilih warna garis dari combo box; menghitung fast fourier transform; membuat gui untuk FFT; membuat gui untuk FFT dengan beberapa sinyal input lain; membuat gui untuk sinyal bising; membuat gui untuk penapisan sinyal berderau; dan membuat gui untuk penapisan sinyal wav. Pada bab 3, Anda akan mempelajari secara langkah demi langkah: mengkonversi citra RGB menjadi grayscale; mengubah citra RGB menjadi citra YUV; mengkonversi citra RGB menjadi citra HSV; memfilter citra; menampilkan histogram citra; menampilkan histogram citra tertapis; memfilter citra dengan memanfaatkan opsi pada kotak centang; menerapkan ambang batas citra; dan menerapkan ambang batas citra adaptif. Pada bab 4, Anda akan mempelajari secara langkah demi langkah: membangkitkan dan menampilkan citra berderau; menerapkan deteksi tepi pada citra; menerapkan segmentasi citra menggunakan algoritma multiple thresholding dan k-means; dan menerapkan penekanan derau citra. Pada bab 5, Anda akan mempelajari secara langkah demi langkah: mendeteksi wajah, mata, dan mulut menggunakan haar cascades; mendeteksi wajah menggunakan haar cascades dengan pyqt; mendeteksi mata, dan mulut menggunakan haar cascades dengan pyqt; dan mengekstraksi objek yang terdeteksi. Pada bab 6, Anda akan mempelajari secara langkah demi langkah: mendeteksi fitur citra menggunakan deteksi harris corner; mendeteksi fitur citra menggunakan deteksi sudut shi-tomasi; mendeteksi fitur citra menggunakan Scale-Invariant Feature Transform (SIFT); dan mendeteksi fitur citra menggunakan Features from Accelerated Uji Segmen (FAST). BUKU 3: IMPLEMENTASI MACHINE LEARNING DENGAN PYTHON GUI Buku ini merupakan versi bahasa Indonesia dari buku kami yang berjudul "LEARN FROM SCRATCH MACHINE LEARNING WITH PYTHON GUI". Anda bisa mengaksesnya di Amazon maupun di Google Books. Pada buku ini, Anda akan mempelajari cara menggunakan NumPy, Pandas, OpenCV, Scikit-Learn, dan pustaka lain untuk memplot grafik dan memproses citra digital. Kemudian, Anda akan mempelajari cara mengklasifikasikan fitur menggunakan model Perceptron, Adaline, Logistic Regression (LR), Support Vector Machine (SVM), Decision Tree (DT), Random Forest (RF), dan K-Nearest Neighbor (KNN). Anda juga akan belajar cara mengekstraksi fitur menggunakan algoritma Principal Component Analysis (PCA), Linear Discriminant Analysis (LDA), Kernel Principal Component Analysis (KPCA) dan menggunakannya dalam pembelajaran mesin (machine learning). Pada Bab 1, Anda akan mempelajari dasar-dasar penggunaan Python GUI dengan Qt Designer. Pada Bab 2, Anda akan mempelajari: Langkah-Langkah Menciptakan Grafik Garis Sederhana; Langkah-Langkah Menampilkan Grafik Garis dengan Python GUI: Bagian 1; Langkah-Langkah Menampilkan Grafik Garis dengan Python GUI: Bagian 2; Langkah-Langkah Menampilkan Dua atau Lebih Grafik pada Sumbu yang Sama; Langkah-Langkah Menciptakan Dua Sumbu pada Satu Canvas; Langkah-Langkah Menggunakan Dua Widget; Langkah-Langkah Menggunakan Dua Widget, Masing-Masing Memiliki Dua Sumbu; Langkah-Langkah Menggunakan Sumbu dengan Tingkat Keburaman Tertentu; Langkah-Langkah Memilih Warna Garis dari Combo Box; Langkah-Langkah Menghitung Fast Fourier Transform; Langkah-Langkah Menciptakan GUI untuk FFT; Langkah-Langkah Menciptakan GUI untuk FFT atas Sinyal-Sinyal Masukan Lain; Langkah-Langkah Menciptakan GUI untuk Sinyal Berderau; Langkah-Langkah Menciptakan GUI untuk Penapisan Sinyal Berderau; Langkah-Langkah Menciptakan GUI untuk Penapisan Sinyal Wav; Langkah-Langkah Mengkonversi Citra RGB Menjadi Keabuan; Langkah-Langkah Mengkonversi Citra RGB Menjadi Citra YUV; Langkah-Langkah Mengkonversi Citra RGB Menjadi Citra HSV; Langkah-Langkah Menapis Citra; Langkah-Langkah Menampilkan Histogram Citra ; Langkah-Langkah Menampilkan Histogram Citra Tertapis; Langkah-Langkah Menapis Citra: Memanfaatkan CheckBox; Langkah-Langkah Mengimplementasikan Ambang Batas Citra; dan Langkah-Langkah Mengimplementasikan Ambang Batas Adaptif. Pada Bab 3, Anda akan mempelajari: Langkah-Langkah Implementasi Perceptron; Langkah-Langkah Implementasi Perceptron dengan PyQt; Langkah-Langkah Implementasi Adaline (ADaptive LInear NEuron); dan Langkah-Langkah

Implementasi Adaline dengan PyQt. Pada Bab 4, Anda akan mempelajari: Langkah-Langkah Implementasi Perceptron Menggunakan Scikit-Learn dengan PyQt; Langkah-Langkah Implementasi Model Logistic Regression (LR); Langkah-Langkah Implementasi Model Logistic Regression dengan PyQt; Langkah-Langkah Implementasi Model Logistic Regression Menggunakan Scikit-Learn dengan PyQt; Langkah-Langkah Implementasi Mode Support Vector Machine (SVM) Menggunakan Scikit-Learn; Langkah-Langkah Implementasi Decision Tree (DT) Menggunakan Scikit-Learn; Langkah-Langkah Implementasi Model Random Forest (RF) Menggunakan Scikit-Learn; dan Langkah-Langkah Implementasi Model K-Nearest Neighbor (KNN) Menggunakan Scikit-Learn. Pada Bab 5, Anda akan mempelajari: Langkah-Langkah Implementasi Principal Component Analysis (PCA); Langkah-Langkah Implementasi Principal Component Analysis (PCA) Menggunakan Scikit-Learn; Langkah-Langkah Implementasi Principal Component Analysis (PCA) Menggunakan Scikit-Learn dengan PyQt; Langkah-Langkah Implementasi Linear Discriminant Analysis (LDA); Langkah-Langkah Implementasi Linear Discriminant Analysis (LDA) dengan scikit-learn; Langkah-Langkah Implementasi Linear Discriminant Analysis (LDA); Menggunakan Scikit-Learn dengan PyQt; Langkah-Langkah Implementasi Kernel Principal Component Analysis (KPCA) Menggunakan Scikit-Learn; dan Langkah-Langkah Implementasi Kernel Principal Component Analysis (KPCA) Menggunakan Scikit-Learn dengan PyQt. Pada Bab 6, Anda akan mempelajari: Langkah-Langkah Memuat Dataset MNIST; Langkah-Langkah Memuat Dataset MNIST dengan PyQt; Langkah-Langkah Implementasi Perceptron dengan Ekstraktor Fitur PCA pada Dataset MNIST Menggunakan PyQt; Langkah-Langkah Implementasi Perceptron dengan Ekstraktor Fitur LDA pada Dataset MNIST Menggunakan PyQt; Langkah-Langkah Implementasi Perceptron dengan Ekstraktor Fitur KPCA pada Dataset MNIST Menggunakan PyQt; Langkah-Langkah Implementasi Logistic Regression (LR) dengan Ekstraktor Fitur PCA pada Dataset MNIST Menggunakan PyQt; Langkah-Langkah Implementasi Logistic Regression (LR) dengan Ekstraktor Fitur LDA pada Dataset MNIST Menggunakan PyQt; Langkah-Langkah Implementasi Logistic Regression (LR) dengan Ekstraktor Fitur KPCA pada Dataset MNIST Menggunakan PyQt; Langkah-Langkah Implementasi Support Vector Machine (SVM) dengan Ekstraktor Fitur PCA pada Dataset MNIST Menggunakan PyQt; Langkah-Langkah Implementasi Support Vector Machine (SVM) dengan Ekstraktor Fitur LDA pada Dataset MNIST Menggunakan PyQt; Langkah-Langkah Implementasi Support Vector Machine (SVM) dengan Ekstraktor Fitur KPCA pada Dataset MNIST Menggunakan PyQt; Langkah-Langkah Implementasi Decision Tree (DT) dengan Ekstraktor Fitur PCA pada Dataset MNIST Menggunakan PyQt; Langkah-Langkah Implementasi Decision Tree (DT) dengan Ekstraktor Fitur LDA pada Dataset MNIST Menggunakan PyQt; Langkah-Langkah Implementasi Decision Tree (DT) dengan Ekstraktor Fitur KPCA pada Dataset MNIST Menggunakan PyQt; Langkah-Langkah Implementasi Random Forest (RF) dengan Ekstraktor Fitur PCA pada Dataset MNIST Menggunakan PyQt; Langkah-Langkah Implementasi Random Forest (RF) dengan Ekstraktor Fitur KPCA pada Dataset MNIST Menggunakan PyQt; Langkah-Langkah Implementasi K-Nearest Neighbor (KNN) dengan Ekstraktor Fitur PCA pada Dataset MNIST Menggunakan PyQt; Langkah-Langkah Implementasi K-Nearest Neighbor (KNN) dengan Ekstraktor Fitur LDA pada Dataset MNIST Menggunakan PyQt; dan Langkah-Langkah Implementasi K-Nearest Neighbor (KNN) dengan Ekstraktor Fitur KPCA pada Dataset MNIST Menggunakan PyQt. Pada Bab 7, Anda akan mempelajari: Langkah-Langkah Membangkitkan dan Menampilkan Citra Berderau; Langkah-Langkah Mengimplementasikan Deteksi Tepi pada Citra; Langkah-Langkah Mengimplementasikan Segmentasi Menggunakan Ambang Batas Jamak dan Algoritma K-Means; Langkah-Langkah Mengimplementasikan Penekanan Derau pada Citra; Langkah-Langkah Mendeteksi Wajah, Mata, dan Mulut dengan Haar Cascades; Langkah-Langkah Mendeteksi Wajah Menggunakan Haar Cascades dengan PyQt; Langkah-Langkah Mendeteksi Mata dan Mulut Menggunakan Haar Cascades dengan PyQt; Langkah-Langkah Mengekstraksi Objek-Objek Terdeteksi; Langkah-Langkah Mendeteksi Fitur Citra dengan Harris Corner Detection; Langkah-Langkah Mendeteksi Fitur Citra dengan Shi-Tomasi Corner Detection; Langkah-Langkah Mendeteksi Fitur Citra dengan Scale-Invariant Feature Transform (SIFT) ; dan Langkah-Langkah Mendeteksi Fitur Citra dengan Accelerated

Segment Test (FAST). BUKU 4: Implementasi DEEP LEARNING Menggunakan Scikit-Learn, Keras, Dan Tensorflow Dengan Python GUI Buku ini merupakan versi bahasa Indonesia dari buku kami yang berjudul "The Practical Guides On Deep Learning Using SCIKIT-LEARN, KERAS, and TENSORFLOW with Python GUI" yang dapat dilihat di Amazon maupun Google Books. Dalam buku ini, Anda akan mempelajari cara menggunakan TensorFlow, Keras, Scikit-Learn, OpenCV, Pandas, NumPy, dan library lainnya untuk mengimplementasikan deep learning dalam mengenali rambu lalu lintas menggunakan dataset GTSRB, mendeteksi tumor otak menggunakan dataset MRI Brain Image, mengklasifikasikan gender, dan mengenali ekspresi wajah menggunakan dataset FER2013. Pada bab 1, Anda akan belajar membuat aplikasi GUI untuk menampilkan grafik garis menggunakan PyQt. Anda juga akan belajar bagaimana mengkonversi citra menjadi keabuan, menjadi ruang warna YUV, dan menjadi ruang warna HSV. Bab ini juga mengajarkan bagaimana menampilkan citra dan histogramnya dan merancang GUI untuk mengimplementasikannya. Pada bab 2, Anda akan belajar menggunakan TensorFlow, Keras, Scikit-Learn, Pandas, NumPy dan sejumlah pustaka lain untuk memprediksi digit-digit tulisan tangan menggunakan dataset MNIST. Pada bab 3, Anda akan mempelajari cara menggunakan TensorFlow, Keras, Scikit-Learn, PIL, Pandas, NumPy, dan pustaka lain untuk mengenali rambu lalu lintas menggunakan dataset GTSRB dari Kaggle. Ada beberapa jenis rambu lalu lintas seperti batas kecepatan, dilarang masuk, rambu lalu lintas, belok kiri atau kanan, anak-anak menyeberang, tidak ada kendaraan berat yang lewat, dll. Klasifikasi rambu lalu lintas adalah proses untuk mengidentifikasi kelas rambu lalu lintas tersebut. Pada proyek Python ini, Anda akan membangun model jaringan saraf tiruan (deep neural network) yang dapat mengklasifikasikan rambu lalu lintas dalam citra ke dalam kategori yang berbeda. Dengan model ini, Anda akan dapat membaca dan memahami rambu lalu lintas yang merupakan pekerjaan yang sangat penting bagi semua kendaraan otonom. Anda juga akan membangun sebuah GUI untuk tujuan ini. Pada bab 4, Anda akan mempelajari cara menggunakan TensorFlow, Keras, Scikit-Learn, Pandas, NumPy dan pustaka lainnya untuk melakukan pendeteksian tumor otak menggunakan dataset Brain Image MRI yang disediakan oleh Kaggle (<https://www.kaggle.com/navoneel/brain-mri-images-for-brain-tumor-detection>). Anda juga akan membangun sebuah GUI untuk tujuan ini. Pada bab 5, Anda akan mempelajari cara menggunakan TensorFlow, Keras, Scikit-Learn, OpenCV, Pandas, NumPy dan library lain untuk melakukan klasifikasi gender menggunakan dataset yang disediakan oleh Kaggle (<https://www.kaggle.com/cashutosh/gender-classification-dataset>). Anda juga akan membangun sebuah GUI untuk tujuan ini. Pada bab 6, Anda akan mempelajari cara menggunakan TensorFlow, Keras, Scikit-Learn, OpenCV, Pandas, NumPy dan pustaka lain untuk melakukan pengenalan ekspresi wajah menggunakan dataset FER2013 yang disediakan oleh Kaggle (<https://www.kaggle.com/nicolejyt/facialexpressionrecognition>). Anda juga akan membangun sebuah GUI untuk tujuan ini. BUKU 5: Panduan Praktis Deep Learning Menggunakan Scikit-Learn, Keras, Dan Tensorflow Dengan Python GUI Buku ini merupakan versi bahasa Indonesia dari buku kami yang berjudul "STEP BY STEP TUTORIALS ON DEEP LEARNING USING SCIKIT-LEARN, KERAS, AND TENSORFLOW WITH PYTHON GUI" yang dapat dilihat di Amazon maupun Google Books. Dalam buku ini, Anda akan mempelajari cara menerapkan TensorFlow, Keras, Scikit-Learn, OpenCV, Pandas, NumPy, dan library lainnya untuk mengimplementasikan deteksi wajah, mata, dan mulut menggunakan Haar Cascades, klasifikasi/prediksi buah, klasifikasi/prediksi kucing/anjing, klasifikasi/prediksi mebel, klasifikasi/prediksi mode (fashion). Pada bab 1, Anda akan belajar bagaimana menggunakan pustaka OpenCV, PIL, NumPy dan pustaka lain untuk melakukan deteksi wajah, mata, dan mulut menggunakan Haar Cascades dengan Python GUI (PyQt). Pada bab 2, Anda akan mempelajari bagaimana memanfaatkan TensorFlow, Keras, Scikit-Learn, OpenCV, Pandas, NumPy dan pustaka-pustaka lain untuk mengimplementasikan klasifikasi buah menggunakan dataset Fruits 360 yang disediakan oleh Kaggle (<https://www.kaggle.com/moltean/fruits/code>). Anda juga akan membangun sebuah GUI untuk tujuan ini. Pada bab 3, Anda akan belajar menerapkan TensorFlow, Keras, Scikit-Learn, OpenCV, Pandas, NumPy dan sejumlah pustaka lain untuk klasifikasi kucing/anjing menggunakan dataset yang disediakan oleh Kaggle

(<https://www.kaggle.com/chetankv/dogs-cats-images>). Anda juga akan membangun sebuah GUI untuk tujuan ini. Pada bab 4, Anda akan belajar menggunakan TensorFlow, Keras, Scikit-Learn, OpenCV, Pandas, NumPy dan pustakan lain untuk mendeteksi atau mengklasifikasi mebel menggunakan dataset Furniture Detector yang disediakan oleh Kaggle (<https://www.kaggle.com/akkithetechie/furniture-detector>). Anda juga akan membangun sebuah GUI untuk tujuan ini. Pada bab 5, Anda akan memanfaatkan TensorFlow, Keras, Scikit-Learn, OpenCV, Pandas, NumPy dan sejumlah modul lain untuk melakukan klasifikasi terhadap citra-citra mode menggunakan dataset Fashion MNIST yang disediakan oleh Kaggle (<https://www.kaggle.com/zalando-research/fashionmnist/code>). Anda juga akan membangun sebuah GUI untuk tujuan ini. BUKU 6: Tutorial Langkah Demi Langkah DEEP LEARNING Menggunakan Scikit-Learn, Keras, Dan Tensorflow Dengan Python GUI Buku ini merupakan versi bahasa Indonesia dari buku kami yang berjudul "Step by Step Tutorials Image Classification Using Scikit-Learn, Keras, and Tensorflow with Python GUI" yang dapat dilihat di Amazon maupun Google Books. Pada bab 1, Anda akan belajar dasar-dasar penggunaan PyQt untuk pemrosesan citra digital. Sejumlah projek Python GUI yang diimplementasikan di sini adalah mengkonversi citra RGB menjadi keabuan, mengkonversi citra RGB menjadi citra YUV, mengkonversi citra RGB menjadi citra HSV, menapis citra, menampilkan histogram citra, menampilkan histogram citra tertapis, dan memanfaatkan widget checkbox untuk penapisan citra, dan menerapkan ambang batas citra. Pada bab 2, Anda akan memanfaatkan TensorFlow, Keras, Scikit-Learn, OpenCV, Pandas, NumPy dan sejumlah pustaka lain untuk mengklasifikasi spesies monyet menggunakan dataset 10 Monkey Species yang disediakan oleh Kaggle (<https://www.kaggle.com/slothkong/10-monkey-species/download>). Anda juga akan membangun sebuah GUI untuk tujuan ini. Pada bab 3, Pada tutorial ini, Anda akan belajar menerapkan TensorFlow, Keras, Scikit-Learn, OpenCV, Pandas, NumPy dan sejumlah pustakan lain untuk mengklasifikasi batu, kertas, dan gunting menggunakan dataset yang disediakan oleh Kaggle (<https://www.kaggle.com/sanikamal/rock-paper-scissors-dataset/download>). Anda juga akan membangun sebuah GUI untuk tujuan ini. Pada bab 4, Anda akan belajar menerapkan TensorFlow, Keras, Scikit-Learn, OpenCV, Pandas, NumPy dan sejumlah pustaka lain untuk mengklasifikasi pesawat, mobil, dan kapal menggunakan dataset Multiclass-image-dataset-airplane-car-ship yang disediakan oleh Kaggle (<https://www.kaggle.com/abtabm/multiclassimagedatasetairplanecar>). Anda juga akan membangun sebuah GUI untuk tujuan ini. Pada bab 5, Anda akan belajar menggunakan TensorFlow, Keras, Scikit-Learn, OpenCV, Pandas, NumPy dan sejumlah pustaka lain untuk mendeteksi face mask menggunakan dataset Face Mask Detection Dataset yang disediakan oleh Kaggle (<https://www.kaggle.com/omkargurav/face-mask-dataset/download>). Anda juga akan membangun sebuah GUI untuk tujuan ini. BUKU 7: Klasifikasi Citra Berbasis Deep Learning Menggunakan Scikit-Learn, Tensorflow, Dan Keras Dengan Python GUI Buku ini merupakan versi bahasa Indonesia dari buku kami yang berjudul "Project-Based Approach On DEEP LEARNING Using Scikit-Learn, Keras, and Tensorflow with Python GUI" yang dapat dilihat di Amazon maupun Google Books. Dalam buku ini, Anda akan mempelajari cara menerapkan TensorFlow, Keras, Scikit-Learn, OpenCV, Pandas, NumPy, dan library lainnya untuk mengimplementasikan klasifikasi citra. Pada Bab 1, Anda akan menggunakan TensorFlow, Keras, Scikit-Learn, OpenCV, Pandas, NumPy danb sejumlah pustaka lain untuk klasifikasi cuaca menggunakan dataset Multi-class Weather Dataset yang disediakan oleh Kaggle (<https://www.kaggle.com/pratik2901/multiclass-weather-dataset/download>). Pada Bab 2, Anda akan menerapkan TensorFlow, Keras, Scikit-Learn, OpenCV, Pandas, NumPy dan sejumlah pustaka lain untuk mengenali jenis bunga menggunakan dataset Flowers Recognition dataset yang disediakan oleh Kaggle (<https://www.kaggle.com/alxmamaev/flowers-recognition/download>). Anda juga akan membangun sebuah GUI untuk tujuan ini. Pada Bab 3, Anda akan menggunakan TensorFlow, Keras, Scikit-Learn, OpenCV, Pandas, NumPy dan sejumlah pustaka lain untuk mendeteksi plat nomor kendaraan menggunakan dataset Car License Plate Detection yang disediakan oleh Kaggle (<https://www.kaggle.com/andrewmvd/car-plate-detection/do>

wnload). Anda juga akan membangun sebuah GUI untuk tujuan ini. Pada Bab 4, Anda akan belajar bagaimana menggunakan TensorFlow, Keras, Scikit-Learn, OpenCV, Pandas, NumPy dan sejumlah pustaka lain untuk melakukan pengenalan bahasa isyarat menggunakan Sign Language Digits Dataset yang disediakan oleh Kaggle (<https://www.kaggle.com/ardamavi/sign-language-digits-dataset/download>). Anda juga akan membangun sebuah GUI untuk tujuan ini. Pada Bab 5, Anda akan belajar bagaimana menerapkan pustaka TensorFlow, Keras, Scikit-Learn, OpenCV, Pandas, NumPy dan sejumlah pustaka lain untuk mendeteksi keretakan permukaan beton menggunakan dataset Surface Crack Detection yang disediakan oleh Kaggle (<https://www.kaggle.com/arunrk7/surface-crack-detection/download>). Anda juga akan membangun sebuah GUI untuk tujuan ini.

Data Science and Deep Learning Workshop For Scientists and Engineers - Vivian Siahaan 2021-11-04

WORKSHOP 1: In this workshop, you will learn how to use TensorFlow, Keras, Scikit-Learn, OpenCV, Pandas, NumPy and other libraries to implement deep learning on recognizing traffic signs using GTSRB dataset, detecting brain tumor using Brain Image MRI dataset, classifying gender, and recognizing facial expression using FER2013 dataset. In Chapter 1, you will learn to create GUI applications to display line graph using PyQt. You will also learn how to display image and its histogram. In Chapter 2, you will learn how to use TensorFlow, Keras, Scikit-Learn, Pandas, NumPy and other libraries to perform prediction on handwritten digits using MNIST dataset with PyQt. You will build a GUI application for this purpose. In Chapter 3, you will learn how to perform recognizing traffic signs using GTSRB dataset from Kaggle. There are several different types of traffic signs like speed limits, no entry, traffic signals, turn left or right, children crossing, no passing of heavy vehicles, etc. Traffic signs classification is the process of identifying which class a traffic sign belongs to. In this Python project, you will build a deep neural network model that can classify traffic signs in image into different categories. With this model, you will be able to read and understand traffic signs which are a very important task for all autonomous vehicles. You will build a GUI application for this purpose. In Chapter 4, you will learn how to perform detecting brain tumor using Brain Image MRI dataset provided by Kaggle

(<https://www.kaggle.com/navoneel/brain-mri-images-for-brain-tumor-detection>) using CNN model. You will build a GUI application for this purpose. In Chapter 5, you will learn how to perform classifying gender using dataset provided by Kaggle

(<https://www.kaggle.com/cashutosh/gender-classification-dataset>) using MobileNetV2 and CNN models. You will build a GUI application for this purpose. In Chapter 6, you will learn how to perform recognizing facial expression using FER2013 dataset provided by Kaggle (<https://www.kaggle.com/nicolejyt/facialexpressionrecognition>) using CNN model. You will also build a GUI application for this purpose. WORKSHOP 2: In this workshop, you will learn how to use TensorFlow, Keras, Scikit-Learn, OpenCV, Pandas, NumPy and other libraries to implement deep learning on classifying fruits, classifying cats/dogs, detecting furnitures, and classifying fashion. In Chapter 1, you will learn to create GUI applications to display line graph using PyQt. You will also learn how to display image and its histogram. Then, you will learn how to use OpenCV, NumPy, and other libraries to perform feature extraction with Python GUI (PyQt). The feature detection techniques used in this chapter are Harris Corner Detection, Shi-Tomasi Corner Detector, and Scale-Invariant Feature Transform (SIFT). In Chapter 2, you will learn how to use TensorFlow, Keras, Scikit-Learn, OpenCV, Pandas, NumPy and other libraries to perform classifying fruits using Fruits 360 dataset provided by Kaggle

(<https://www.kaggle.com/moltean/fruits/code>) using Transfer Learning and CNN models. You will build a GUI application for this purpose. In Chapter 3, you will learn how to use TensorFlow, Keras, Scikit-Learn, OpenCV, Pandas, NumPy and other libraries to perform classifying cats/dogs using dataset provided by Kaggle (<https://www.kaggle.com/chetankv/dogs-cats-images>) using CNN with Data Generator. You will build a GUI application for this purpose. In Chapter 4, you will learn how to use TensorFlow, Keras, Scikit-Learn,

OpenCV, Pandas, NumPy and other libraries to perform detecting furnitures using Furniture Detector dataset provided by Kaggle (<https://www.kaggle.com/akkithetechie/furniture-detector>) using VGG16 model. You will build a GUI application for this purpose. In Chapter 5, you will learn how to use TensorFlow, Keras, Scikit-Learn, OpenCV, Pandas, NumPy and other libraries to perform classifying fashion using Fashion MNIST dataset provided by Kaggle (<https://www.kaggle.com/zalando-research/fashionmnist/code>) using CNN model. You will build a GUI application for this purpose. WORKSHOP 3: In this workshop, you will implement deep learning on detecting vehicle license plates, recognizing sign language, and detecting surface crack using TensorFlow, Keras, Scikit-Learn, OpenCV, Pandas, NumPy and other libraries. In Chapter 1, you will learn how to use TensorFlow, Keras, Scikit-Learn, OpenCV, Pandas, NumPy and other libraries to perform detecting vehicle license plates using Car License Plate Detection dataset provided by Kaggle (<https://www.kaggle.com/andrewmvd/car-plate-detection/download>). In Chapter 2, you will learn how to use TensorFlow, Keras, Scikit-Learn, OpenCV, Pandas, NumPy and other libraries to perform sign language recognition using Sign Language Digits Dataset provided by Kaggle (<https://www.kaggle.com/ardamavi/sign-language-digits-dataset/download>). In Chapter 3, you will learn how to use TensorFlow, Keras, Scikit-Learn, OpenCV, Pandas, NumPy and other libraries to perform detecting surface crack using Surface Crack Detection provided by Kaggle (<https://www.kaggle.com/arunrk7/surface-crack-detection/download>). WORKSHOP 4: In this workshop, implement deep learning-based image classification on detecting face mask, classifying weather, and recognizing flower using TensorFlow, Keras, Scikit-Learn, OpenCV, Pandas, NumPy and other libraries. In Chapter 1, you will learn how to use TensorFlow, Keras, Scikit-Learn, OpenCV, Pandas, NumPy and other libraries to perform detecting face mask using Face Mask Detection Dataset provided by Kaggle (<https://www.kaggle.com/omkargurav/face-mask-dataset/download>). In Chapter 2, you will learn how to use TensorFlow, Keras, Scikit-Learn, OpenCV, Pandas, NumPy and other libraries to perform how to classify weather using Multi-class Weather Dataset provided by Kaggle (<https://www.kaggle.com/pratik2901/multiclass-weather-dataset/download>). WORKSHOP 5: In this workshop, implement deep learning-based image classification on classifying monkey species, recognizing rock, paper, and scissor, and classify airplane, car, and ship using TensorFlow, Keras, Scikit-Learn, OpenCV, Pandas, NumPy and other libraries. In Chapter 1, you will learn how to use TensorFlow, Keras, Scikit-Learn, OpenCV, Pandas, NumPy and other libraries to perform how to classify monkey species using 10 Monkey Species dataset provided by Kaggle

(<https://www.kaggle.com/slothkong/10-monkey-species/download>). In Chapter 2, you will learn how to use TensorFlow, Keras, Scikit-Learn, OpenCV, Pandas, NumPy and other libraries to perform how to recognize rock, paper, and scissor using 10 Monkey Species dataset provided by Kaggle (<https://www.kaggle.com/sanikamal/rock-paper-scissors-dataset/download>). WORKSHOP 6: In this workshop, you will implement two data science projects using Scikit-Learn, Scipy, and other libraries with Python GUI. In Chapter 1, you will learn how to use Scikit-Learn, Scipy, and other libraries to perform how to predict traffic (number of vehicles) in four different junctions using Traffic Prediction Dataset provided by Kaggle (<https://www.kaggle.com/fedoriano/traffic-prediction-dataset/download>). This dataset contains 48.1k (48120) observations of the number of vehicles each hour in four different junctions: 1) DateTime; 2) Junction; 3) Vehicles; and 4) ID. In Chapter 2, you will learn how to use Scikit-Learn, NumPy, Pandas, and other libraries to perform how to analyze and predict heart attack using Heart Attack Analysis & Prediction Dataset provided by Kaggle (<https://www.kaggle.com/rashikrahmanpritom/heart-attack-analysis-prediction-dataset/download>). WORKSHOP 7: In this workshop, you will implement two data science projects using Scikit-Learn, Scipy, and other libraries with Python GUI. In Project 1, you will learn how to use Scikit-Learn, NumPy, Pandas, Seaborn, and other libraries to perform how to predict early stage diabetes using Early Stage Diabetes Risk Prediction Dataset provided by Kaggle

(<https://www.kaggle.com/ishandutta/early-stage-diabetes-risk-prediction-dataset/download>). This dataset contains the sign and symptom data of newly diabetic or would be diabetic patient. This has been collected using direct questionnaires from the patients of Sylhet Diabetes Hospital in Sylhet, Bangladesh and approved by a doctor. You will develop a GUI using PyQt5 to plot distribution of features, feature importance, cross validation score, and predicted values versus true values. The machine learning models used in this project are Adaboost, Random Forest, Gradient Boosting, Logistic Regression, and Support Vector Machine. In Project 2, you will learn how to use Scikit-Learn, NumPy, Pandas, and other libraries to perform how to analyze and predict breast cancer using Breast Cancer Prediction Dataset provided by Kaggle

(<https://www.kaggle.com/merishnasuwal/breast-cancer-prediction-dataset/download>). Worldwide, breast cancer is the most common type of cancer in women and the second highest in terms of mortality rates. Diagnosis of breast cancer is performed when an abnormal lump is found (from self-examination or x-ray) or a tiny speck of calcium is seen (on an x-ray). After a suspicious lump is found, the doctor will conduct a diagnosis to determine whether it is cancerous and, if so, whether it has spread to other parts of the body. This breast cancer dataset was obtained from the University of Wisconsin Hospitals, Madison from Dr. William H. Wolberg. You will develop a GUI using PyQt5 to plot distribution of features, pairwise relationship, test scores, predicted values versus true values, confusion matrix, and decision boundary. The machine learning models used in this project are K-Nearest Neighbor, Random Forest, Naive Bayes, Logistic Regression, Decision Tree, and Support Vector Machine. WORKSHOP 8: In this workshop, you will learn how to use Scikit-Learn, TensorFlow, Keras, NumPy, Pandas, Seaborn, and other libraries to implement brain tumor classification and detection with machine learning using Brain Tumor dataset provided by Kaggle. This dataset contains five first order features: Mean (the contribution of individual pixel intensity for the entire image), Variance (used to find how each pixel varies from the neighboring pixel), Standard Deviation (the deviation of measured Values or the data from its mean), Skewness (measures of symmetry), and Kurtosis (describes the peak of e.g. a frequency distribution). It also contains eight second order features: Contrast, Energy, ASM (Angular second moment), Entropy, Homogeneity, Dissimilarity, Correlation, and Coarseness. The machine learning models used in this project are K-Nearest Neighbor, Random Forest, Naive Bayes, Logistic Regression, Decision Tree, and Support Vector Machine. The deep learning models used in this project are MobileNet and ResNet50. In this project, you will develop a GUI using PyQt5 to plot boundary decision, ROC, distribution of features, feature importance, cross validation score, and predicted values versus true values, confusion matrix, training loss, and training accuracy. WORKSHOP 9: In this workshop, you will learn how to use Scikit-Learn, Keras, TensorFlow, NumPy, Pandas, Seaborn, and other libraries to perform COVID-19 Epitope Prediction using COVID-19/SARS B-cell Epitope Prediction dataset provided in Kaggle. All of three datasets consists of information of protein and peptide: parent_protein_id : parent protein ID; protein_seq : parent protein sequence; start_position : start position of peptide; end_position : end position of peptide; peptide_seq : peptide sequence; chou_fasman : peptide feature; emini : peptide feature, relative surface accessibility; kolaskar_tongaonkar : peptide feature, antigenicity; parker : peptide feature, hydrophobicity; isoelectric_point : protein feature; aromacity: protein feature; hydrophobicity : protein feature; stability : protein feature; and target : antibody valence (target value). The machine learning models used in this project are K-Nearest Neighbor, Random Forest, Naive Bayes, Logistic Regression, Decision Tree, Support Vector Machine, Adaboost, Gradient Boosting, XGB classifier, and MLP classifier. Then, you will learn how to use sequential CNN and VGG16 models to detect and predict Covid-19 X-RAY using COVID-19 Xray Dataset (Train & Test Sets) provided in Kaggle. The folder itself consists of two subfolders: test and train. Finally, you will develop a GUI using PyQt5 to plot boundary decision, ROC, distribution of features, feature importance, cross validation score, and predicted values versus true values, confusion matrix, training loss, and training

accuracy. WORKSHOP 10: In this workshop, you will learn how to use Scikit-Learn, Keras, TensorFlow, NumPy, Pandas, Seaborn, and other libraries to perform analyzing and predicting stroke using dataset provided in Kaggle. The dataset consists of attribute information: id: unique identifier; gender: "Male", "Female" or "Other"; age: age of the patient; hypertension: 0 if the patient doesn't have hypertension, 1 if the patient has hypertension; heart_disease: 0 if the patient doesn't have any heart diseases, 1 if the patient has a heart disease; ever_married: "No" or "Yes"; work_type: "children", "Govt_jov", "Never_worked", "Private" or "Self-employed"; Residence_type: "Rural" or "Urban"; avg_glucose_level: average glucose level in blood; bmi: body mass index; smoking_status: "formerly smoked", "never smoked", "smokes" or "Unknown"; and stroke: 1 if the patient had a stroke or 0 if not. The models used in this project are K-Nearest Neighbor, Random Forest, Naive Bayes, Logistic Regression, Decision Tree, Support Vector Machine, Adaboost, LGBM classifier, Gradient Boosting, XGB classifier, MLP classifier, and CNN 1D. Finally, you will develop a GUI using PyQt5 to plot boundary decision, ROC, distribution of features, feature importance, cross validation score, and predicted values versus true values, confusion matrix, learning curve, performance of the model, scalability of the model, training loss, and training accuracy. WORKSHOP 11: In this workshop, you will learn how to use Scikit-Learn, Keras, TensorFlow, NumPy, Pandas, Seaborn, and other libraries to perform classifying and predicting Hepatitis C using dataset provided by UCI Machine Learning Repository. All attributes in dataset except Category and Sex are numerical. Attributes 1 to 4 refer to the data of the patient: X (Patient ID/No.), Category (diagnosis) (values: '0=Blood Donor', '0s=suspect Blood Donor', '1=Hepatitis', '2=Fibrosis', '3=Cirrhosis'), Age (in years), Sex (f,m), ALB, ALP, ALT, AST, BIL, CHE, CHOL, CREA, GGT, and PROT. The target attribute for classification is Category (2): blood donors vs. Hepatitis C patients (including its progress ('just' Hepatitis C, Fibrosis, Cirrhosis). The models used in this project are K-Nearest Neighbor, Random Forest, Naive Bayes, Logistic Regression, Decision Tree, Support Vector Machine, Adaboost, LGBM classifier, Gradient Boosting, XGB classifier, MLP classifier, and ANN 1D. Finally, you will develop a GUI using PyQt5 to plot boundary decision, ROC, distribution of features, feature importance, cross validation score, and predicted values versus true values, confusion matrix, learning curve, performance of the model, scalability of the model, training loss, and training accuracy.

[Recent Trends in Image and Signal Processing in Computer Vision](#) - Shruti Jain 2020-03-04

This book highlights recent advances and emerging technologies that utilize computational intelligence in signal processing, computing, imaging science, artificial intelligence, and their applications. It covers all branches of artificial intelligence and machine learning that are based on computation at some level, e.g. artificial neural networks, evolutionary algorithms, fuzzy systems, and automatic medical identification systems. Exploring recent trends in research and applications, the book offers a valuable resource for professors, researchers, and engineers alike.

[Artificial Intelligence for Data Science in Theory and Practice](#) - Mohamed Alloghani 2022-04-05

This book provides valuable information on effective, state-of-the-art techniques and approaches for governments, students, researchers, practitioners, entrepreneurs and teachers in the field of artificial intelligence (AI). The book explains the data and AI, types and properties of data, the relation between AI algorithms and data, what makes data AI ready, steps of data pre-processing, data quality, data storage and data platforms. Therefore, this book will be interested by AI practitioners, academics, researchers, and lecturers in computer science, artificial intelligence, machine learning and data sciences.

[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.

Communication Software and Networks - Suresh Chandra Satapathy 2020-10-03

This book highlights a collection of high-quality peer-reviewed research papers presented at the Sixth International Conference on Information System Design and Intelligent Applications (INDIA 2019), held at Lendi Institute of Engineering & Technology, Vizianagaram, Andhra Pradesh, India, from 1 to 2 November 2019. It covers a wide range of topics in computer science and information technology, from wireless networks, social networks, wireless sensor networks, information and network security, to web security, Internet of Things, bioinformatics, geoinformatics and computer networks.

Image and Graphics - Yu-Jin Zhang 2015-08-03

This book constitutes the refereed conference proceedings of the 8th International Conference on Image and Graphics, ICIG 2015 held in Tianjin, China, in August 2015. The 164 revised full papers and 6 special issue papers were carefully reviewed and selected from 339 submissions. The papers focus on various advances of theory, techniques and algorithms in the fields of images and graphics.

Project-Based Approach On DEEP LEARNING Using Scikit-Learn, Keras, And TensorFlow with Python GUI - Vivian Siahaan 2021-05-16

In this book, you will implement deep learning on detecting vehicle license plates, recognizing sign language, and detecting surface crack using TensorFlow, Keras, Scikit-Learn, OpenCV, Pandas, NumPy and other libraries. In Chapter 1, you will learn how to use TensorFlow, Keras, Scikit-Learn, OpenCV, Pandas, NumPy

and other libraries to perform detecting vehicle license plates using Car License Plate Detection dataset provided by Kaggle

(<https://www.kaggle.com/andrewmvd/car-plate-detection/download>). In Chapter 2, you will learn how to use TensorFlow, Keras, Scikit-Learn, OpenCV, Pandas, NumPy and other libraries to perform sign language recognition using Sign Language Digits Dataset provided by Kaggle (<https://www.kaggle.com/ardamavi/sign-language-digits-dataset/download>). In Chapter 3, you will learn how to use TensorFlow, Keras, Scikit-Learn, OpenCV, Pandas, NumPy and other libraries to perform detecting surface crack using Surface Crack Detection provided by Kaggle (<https://www.kaggle.com/arunrk7/surface-crack-detection/download>).

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 Features Gain a fundamental understanding of advanced computer vision and neural network models in use today Cover tasks such as low-level vision, image classification, and object detection Develop deep learning models on cloud platforms and optimize them using TensorFlow Lite and the OpenVINO toolkit Book 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 learn Explore methods of feature extraction and image retrieval and visualize different layers of the neural network model Use TensorFlow for various visual search methods for real-world scenarios Build neural networks or adjust parameters to optimize the performance of models Understand TensorFlow DeepLab to perform semantic segmentation on images and DCGAN for image inpainting Evaluate your model and optimize and integrate it into your application to operate at scale Get up to speed with techniques for performing manual and automated image annotation Who 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.