

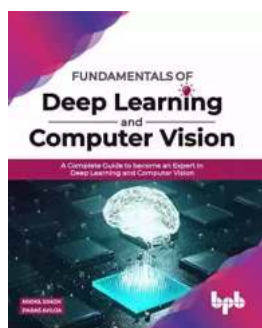
The Ultimate Guide to Master the Fundamentals of Deep Learning and Computer Vision

Are you ready to dive into the exciting world of deep learning and computer vision? Whether you're a beginner or an experienced programmer, this comprehensive guide will provide you with all the essential knowledge and tools to understand and apply these cutting-edge technologies.

Chapter 1: to Deep Learning

In today's digital era, deep learning has emerged as a powerful tool that enables machines to learn and make decisions like humans. By mimicking the neural networks of the human brain, deep learning algorithms can analyze vast amounts of data, recognize patterns, and make predictions with remarkable accuracy.

This chapter will cover the basics of deep learning, including neural networks, activation functions, and loss functions. You will also discover the popular deep learning frameworks such as TensorFlow and PyTorch, and learn how to build your own deep learning models.



Fundamentals of Deep Learning and Computer Vision: A Complete Guide to become an Expert in Deep Learning and Computer Vision (English Edition)

by Nikhil Singh (Kindle Edition)

★★★★☆ 4 out of 5

Language : English

File size : 10220 KB

Text-to-Speech : Enabled

Screen Reader : Supported

Enhanced typesetting : Enabled



Chapter 2: to Computer Vision

Computer vision is a subfield of artificial intelligence that focuses on enabling computers to understand and interpret visual information from images or videos. The advancements in computer vision have revolutionized various industries, from self-driving cars to facial recognition systems.

In this chapter, you will explore the fundamental concepts of computer vision, including image preprocessing, feature extraction, and object detection algorithms. You will also learn about popular computer vision libraries such as OpenCV and how to apply them in real-world scenarios.

Chapter 3: Deep Learning for Computer Vision

Combining deep learning with computer vision has resulted in remarkable breakthroughs in image classification, object detection, and image generation. This chapter will delve deeper into the integration of these two fields.

You will learn about Convolutional Neural Networks (CNNs), which are widely used in computer vision tasks. Discover how CNNs leverage their ability to detect and extract key features from images, enabling accurate image recognition and classification.

We will also explore advanced topics such as transfer learning, which allows you to leverage pre-trained models to solve similar problems, and generative adversarial networks (GANs), which are used for realistic image synthesis.

Chapter 4: Applications of Deep Learning and Computer Vision

Deep learning and computer vision find applications in numerous domains, transforming industries and revolutionizing the way we live and work. In this chapter, we will explore some of these practical applications.

You will discover how deep learning is applied in healthcare for early disease detection, autonomous vehicles for safe navigation, and security systems for facial recognition. Moreover, you will also explore emerging trends such as augmented reality and virtual reality and how they rely on computer vision technologies.

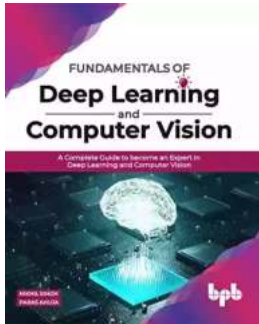
Chapter 5: Challenges and Future of Deep Learning and Computer Vision

While deep learning and computer vision have made significant progress in recent years, there are still challenges that need to be overcome. In this final chapter, we will discuss some of these challenges and potential future developments.

From ethical considerations to data privacy concerns, we will explore the societal impact of these technologies. Additionally, you will gain insights into ongoing research and emerging trends, such as explainable AI and reinforcement learning, which are poised to shape the future of deep learning and computer vision.

Congratulations! You have embarked on an exhilarating journey through the fundamentals of deep learning and computer vision. By understanding the basics, exploring the integration of these fields, and discovering their applications and challenges, you are well-equipped to leverage these technologies to solve complex problems and create innovative solutions.

Remember, deep learning and computer vision are rapidly evolving fields, so don't stop here. Keep expanding your knowledge, experimenting with new ideas, and staying up-to-date with the latest advancements to stay ahead of the curve in this exciting domain.



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Master Computer Vision concepts using Deep Learning with easy-to-follow steps

Key Features

- Setting up the Python and TensorFlow environment
- Learn core Tensorflow concepts with the latest TF version 2.0
- Learn Deep Learning for computer vision applications
- Understand different computer vision concepts and use-cases
- Understand different state-of-the-art CNN architectures
- Build deep neural networks with transfer Learning using features from pre-trained CNN models
- Apply computer vision concepts with easy-to-follow code in Jupyter Notebook

Description

This book starts with setting up a Python virtual environment with the deep learning framework TensorFlow and then introduces the fundamental concepts of TensorFlow. Before moving on to Computer Vision, you will learn about neural networks and related aspects such as loss functions, gradient descent optimization, activation functions and how backpropagation works for training multi-layer perceptrons.

To understand how the Convolutional Neural Network (CNN) is used for computer vision problems, you need to learn about the basic convolution operation. You will learn how CNN is different from a multi-layer perceptron along with a thorough discussion on the different building blocks of the CNN architecture such as kernel size, stride, padding, and pooling and finally learn how to build a small CNN model.

Next, you will learn about different popular CNN architectures such as AlexNet, VGGNet, Inception, and ResNets along with different object detection algorithms such as RCNN, SSD, and YOLO. The book concludes with a chapter on sequential models where you will learn about RNN, GRU, and LSTMs and their architectures and understand their applications in machine translation, image/video captioning and video classification.

What will you learn

This book will help the readers to understand and apply the latest Deep Learning technologies to different interesting computer vision applications without any prior domain knowledge of image processing. Thus, helping the users to acquire new skills specific to Computer Vision and Deep Learning and build solutions to real-life problems such as Image Classification and Object Detection.

Who this book is for

This book is for all the Data Science enthusiasts and practitioners who intend to learn and master Computer Vision concepts and their applications using Deep Learning. This book assumes a basic Python understanding with hands-on experience. A basic senior secondary level understanding of Mathematics will help the reader to make the best out of this book.

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4. CNN Architectures

5. Sequential Models

About the Author

Nikhil Singh is an accomplished data scientist and currently working as the Lead Data Scientist at Proarch IT Solutions Pvt. Ltd in London. He has experience in designing and delivering complex and innovative computer vision and NLP centred solutions for a large number of global companies. He has been an AI consultant to a few companies and mentored many apprentice Data Scientists.

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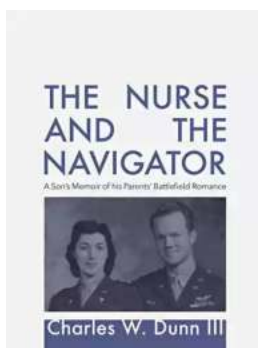
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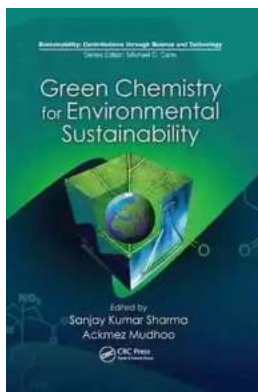
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