

# Deep Learning Neural Networks On Mobile Platforms

**Pat Nakamoto**

*Mobile Deep Learning with TensorFlow Lite, ML Kit and Flutter* Anubhav Singh, Rimjhim Bhadani, 2020-04-06 Learn how to deploy effective deep learning solutions on cross-platform applications built using TensorFlow Lite, ML Kit, and Flutter

**Key Features** Work through projects covering mobile vision, style transfer, speech processing, and multimedia processing

**Cover interesting deep learning solutions for mobile** Build your confidence in training models, performance tuning, memory optimization, and neural network deployment through every project

**Book Description** Deep learning is rapidly becoming the most popular topic in the mobile app industry. This book introduces trending deep learning concepts and their use cases with an industrial and application-focused approach. You will cover a range of projects covering tasks such as mobile vision, facial recognition, smart artificial intelligence assistant, augmented reality, and more. With the help of eight projects, you will learn how to integrate deep learning processes into mobile platforms, iOS, and Android. This will help you to transform deep learning features into robust mobile apps efficiently. You'll get hands-on experience of selecting the right deep learning architectures and optimizing mobile deep learning models while following an application oriented-approach to deep learning on native mobile apps. We will later cover various pre-trained and custom-built deep learning model-based APIs such as machine learning (ML) Kit through Firebase. Further on, the book will take you through examples of creating custom deep learning models with TensorFlow Lite. Each project will demonstrate how to integrate deep learning libraries into your mobile apps, right from preparing the model through to deployment. By the end of this book, you'll have mastered the skills to build and deploy deep learning mobile applications on both iOS and Android. What you will learn

- Create your own customized chatbot by extending the functionality of Google Assistant
- Improve learning accuracy with the help of features available on mobile devices
- Perform visual recognition tasks using image processing
- Use augmented reality to generate captions for a camera feed
- Authenticate users and create a mechanism to identify rare and suspicious user interactions
- Develop a chess engine based on deep reinforcement learning
- Explore the concepts and methods involved in rolling out production-ready deep learning iOS and Android applications

**Who this book is for** This book is for data scientists, deep learning and computer vision engineers, and natural language processing (NLP) engineers who want to build smart mobile apps using deep learning methods. You will also find this book useful if you want to improve your mobile app's user interface (UI) by harnessing the potential of deep learning. Basic knowledge of neural networks and coding experience in

Python will be beneficial to get started with this book.

*Neural Networks and Deep Learning* Pat Nakamoto, 2018-06-30 What's Inside? This includes 3 manuscripts: Book 1: Neural Networks & Deep Learning: Deep Learning explained to your granny - A visual introduction for beginners who want to make their own Deep Learning Neural Network... What you will gain from this book: \* A deep understanding of how Deep Learning works \* A basics comprehension on how to build a Deep Neural Network from scratch Who this book is for: \* Beginners who want to approach the topic, but are too afraid of complex math to start! \* Two main Types of Machine Learning Algorithms \* A practical example of Unsupervised Learning \* What are Neural Networks? \* McCulloch-Pitts's Neuron \* Types of activation function \* Types of network architectures \* Learning processes \* Advantages and disadvantages \* Let us give a memory to our Neural Network \* The example of book writing Software \* Deep learning: the ability of learning to learn \* How does Deep Learning work? \* Main architectures and algorithms \* Main types of DNN \* Available Frameworks and libraries \* Convolutional Neural Networks \* Tunnel Vision \* Convolution \* The right Architecture for a Neural Network \* Test your Neural Network \* A general overview of Deep Learning \* What are the limits of Deep Learning? \* Deep Learning: the basics \* Layers, Learning paradigms, Training, Validation \* Main architectures and algorithms \* Models for Deep Learning \* Probabilistic graphic models \* Restricted Boltzmann Machines \* Deep Belief Networks Book2: Deep Learning: Deep Learning explained to your granny - A guide for Beginners... What's Inside? \* A general overview of Deep Learning \* What are the limits of Deep Learning? \* Deep Learning: the basics \* Layers, Learning paradigms, Training, Validation \* Main architectures and algorithms \* Convolutional Neural Networks \* Models for Deep Learning \* Probabilistic graphic models \* Restricted Boltzmann Machines \* Deep Belief Networks \* Available Frameworks and libraries \* TensorFlow Book 3: Big Data: The revolution that is transforming our work, market and world... Within 2 days we produce the same amount of data generated by at the beginning of the civilization until 2003, said Eric Schmidt in 2010. According to IBM, by 2020 the world will have generated a mass of data on the order of 40 zettabyte (10<sup>21</sup>Byte). Just think, for example, of digital content such as photos, videos, blogs, posts, and everything that revolves around social networks; only Facebook marks 30 billion pieces of content each month shared by its users. The explosion of social networks, combined with the emergence of smartphones, justifies the fact that one of the recurring terms of recent years in the field of innovation, marketing and IT is Big Data. The term Big Data indicates data produced in massive quantities, with remarkable rapidity and in the most diverse formats, which require technologies and resources that go far beyond conventional data management and storage systems. In order to obtain from the use of this data the maximum results in the shortest possible time or even in real time, specific tools with high computing capabilities are necessary. But what does the Big Data phenomenon mean? Is the proliferation of data simply the sign of an increasingly invasive world? Or is there something more to it? Pat Nakamoto will guide you through the discovery of the world of Big data, which, according to experts, in the near future could become the new gold or oil, in what

is a real Data Driven economy.

**Advances and Applications in Deep Learning** ,2020-12-09 Artificial Intelligence (AI) has attracted the attention of researchers and users alike and is taking an increasingly crucial role in our modern society. From cars, smartphones, and airplanes to medical equipment, consumer applications, and industrial machines, the impact of AI is notoriously changing the world we live in. In this context, Deep Learning (DL) is one of the techniques that has taken the lead for cognitive processes, pattern recognition, object detection, and machine learning, all of which have played a crucial role in the growth of AI. As such, this book examines DL applications and future trends in the field. It is a useful resource for researchers and students alike.

*Feasibility of Neural Networks for Maritime Visual Detection on a Mobile Platform* Robert Goring,2017 Object detection through computer vision has traditionally been difficult to reliably implement due to various lighting conditions caused by weather and time of day. Any changes in conditions can be detrimental to the detector's ability to accurately identify objects. A modern approach implements deep learning techniques to classify and train a neural network. While highly effective, this approach can be cumbersome and computationally intensive. This project will investigate the feasibility of using deep learning to detect, classify. And track objects in near real-time while being processed on a mobile platform. I will investigate the feasibility of these processes on a small embedded system, such as the NVIDIA Jetson TX1. I will investigate several promising algorithms such as Faster R-CNN. Tensor Box, DetectNet, and YOLO. This research is beneficial because it will transition deep learning techniques developed primarily for research in a lab environment to a real-world situation in which high accuracy and fast processing are vital. The work solved through this research will greatly benefit platforms that require object detection capabilities, but do not have the space, budget, or power capabilities for large GPUs or GPU clusters.

Mobile Artificial Intelligence Projects Karthikeyan NG,Arun Padmanabhan,Matt R. Cole,2019-03-30 Learn to build end-to-end AI apps from scratch for Android and iOS using TensorFlow Lite, CoreML, and PyTorch Key FeaturesBuild practical, real-world AI projects on Android and iOSImplement tasks such as recognizing handwritten digits, sentiment analysis, and moreExplore the core functions of machine learning, deep learning, and mobile visionBook Description We're witnessing a revolution in Artificial Intelligence, thanks to breakthroughs in deep learning. Mobile Artificial Intelligence Projects empowers you to take part in this revolution by applying Artificial Intelligence (AI) techniques to design applications for natural language processing (NLP), robotics, and computer vision. This book teaches you to harness the power of AI in mobile applications along with learning the core functions of NLP, neural networks, deep learning, and mobile vision. It features a range of projects, covering tasks such as real-estate price prediction, recognizing hand-written digits, predicting car damage, and sentiment analysis. You will learn to utilize NLP and machine learning algorithms to make applications more predictive, proactive, and capable of making autonomous decisions with less human input. In the concluding chapters, you

will work with popular libraries, such as TensorFlow Lite, CoreML, and PyTorch across Android and iOS platforms. By the end of this book, you will have developed exciting and more intuitive mobile applications that deliver a customized and more personalized experience to users. What you will learn

Explore the concepts and fundamentals of AI, deep learning, and neural networks  
Implement use cases for machine vision and natural language processing  
Build an ML model to predict car damage using TensorFlow  
Deploy TensorFlow on mobile to convert speech to text  
Implement GAN to recognize hand-written digits  
Develop end-to-end mobile applications that use AI principles

Work with popular libraries, such as TensorFlow Lite, CoreML, and PyTorch

Who this book is for

Mobile Artificial Intelligence Projects is for machine learning professionals, deep learning engineers, AI engineers, and software engineers who want to integrate AI technology into mobile-based platforms and applications. Sound knowledge of machine learning and experience with any programming language is all you need to get started with this book.

**Practical TensorFlow.js** Juan De Dios Santos Rivera, 2020-10-03

Develop and deploy deep learning web apps using the TensorFlow.js library. TensorFlow.js is part of a bigger framework named TensorFlow, which has many tools that supplement it, such as TensorBoard, ml5js, tfjs-vis. This book will cover all these technologies and show they integrate with TensorFlow.js to create intelligent web apps. The most common and accessible platform users interact with everyday is their web browser, making it an ideal environment to deploy AI systems. TensorFlow.js is a well-known and battle-tested library for creating browser solutions. Working in JavaScript, the so-called language of the web, directly on a browser, you can develop and serve deep learning applications. You'll work with deep learning algorithms such as feedforward neural networks, convolutional neural networks (CNN), recurrent neural networks (RNN), and generative adversarial network (GAN). Through hands-on examples, apply these networks in use cases related to image classification, natural language processing, object detection, dimensionality reduction, image translation, transfer learning, and time series analysis. Also, these topics are very varied in terms of the kind of data they use, their output, and the training phase. Not everything in machine learning is deep networks, there is also what some call shallow or traditional machine learning. While TensorFlow.js is not the most common place to implement these, you'll be introduced to them and review the basics of machine learning through TensorFlow.js. What You'll Learn

Build deep learning products suitable for web browsers  
Work with deep learning algorithms such as feedforward neural networks, convolutional neural networks (CNN), recurrent neural networks (RNN), and generative adversarial network (GAN)  
Develop apps using image classification, natural language processing, object detection, dimensionality reduction, image translation, transfer learning, and time series analysis

Who This Book Is For

Programmers developing deep learning solutions for the web and those who want to learn TensorFlow.js with at least minimal programming and software development knowledge. No prior JavaScript knowledge is required, but familiarity with it is helpful.

The Deep Learning AI Playbook Carlos Perez, 2017-10-11

Just like any new technology, what perplexes many is the

question of how to apply Deep Learning in a business context. Technology that is disruptive does not automatically imply that the development of valuable use cases are apparent. For years, many people could not figure out how to monetize the World Wide Web. We are in that same situation with Deep Learning AI. The developments are mind-boggling but the monetization is far from being obvious. Deep Learning Artificial Intelligence involves the interplay of Computer Science, Physics, Biology, Linguistics and Psychology. In addition to that, it is technology that can be extremely disruptive. Furthermore, the ramifications to society and even our own humanity can be immense. There are few subjects that are as captivating and as consequential as this. Surprisingly, there is very little that is written about this new technology in a more comprehensive and cohesive way. This book is an opinionated take on the developments of Deep Learning AI.

*MatConvNet Deep Learning and iOS Mobile App Design for Pattern Recognition: Emerging Research and Opportunities*  
Wu, Jiann-Ming, Tien, Chao-Yuan, 2020-04-17 Deep learning has become a trending area of research due to its adaptive characteristics and high levels of applicability. In recent years, researchers have begun applying deep learning strategies to image analysis and pattern recognition for solving technical issues within image classification. As these technologies continue to advance, professionals have begun translating this intelligent programming language into mobile applications for devices. Programmers and web developers are in need of significant research on how to successfully develop pattern recognition applications using intelligent programming. *MatConvNet Deep Learning and iOS Mobile App Design for Pattern Recognition: Emerging Research and Opportunities* is an essential reference source that presents a solution to developing intelligent pattern recognition Apps on iOS devices based on MatConvNet deep learning. Featuring research on topics such as medical image diagnosis, convolutional neural networks, and character classification, this book is ideally designed for programmers, developers, researchers, practitioners, engineers, academicians, students, scientists, and educators seeking coverage on the specific development of iOS mobile applications using pattern recognition strategies.

**Neural Networks and Deep Learning** Pat Nakamoto, 2018-01-12 Ready to crank up a neural network to get your self-driving car pick up the kids from school? Want to add 'Deep Learning' to your LinkedIn profile? Well, hold on there... Before you embark on your epic journey into the world of deep learning, there is basic theory to march through first! Take a step-by-step journey through the basics of Neural Networks and Deep Learning, made so simple that...even your granny could understand it! What you will gain from this book: \* A deep understanding of how a Neural Network and Deep Learning work \* A basics comprehension on how to build a Deep Neural Network from scratch Who this book is for: \* Beginners who want to approach the topic, but are too afraid of complex math to start! What's Inside? \* A brief introduction to Machine Learning \* Two main Types of Machine Learning Algorithms \* A practical example of Unsupervised Learning \* What are Neural Networks? \* McCulloch-Pitts's Neuron \* Types of activation function \* Types of network architectures \* Learning processes \* Advantages and disadvantages \* Let us give a memory to our Neural Network \* The example of book writing Software \* Deep

learning: the ability of learning to learn \* How does Deep Learning work? \* Main architectures and algorithms \* Main types of DNN \* Available Frameworks and libraries \* Convolutional Neural Networks \* Tunnel Vision \* Convolution \* The right Architecture for a Neural Network \* Test your Neural Network \* A general overview of Deep Learning \* What are the limits of Deep Learning? \* Deep Learning: the basics \* Layers, Learning paradigms, Training, Validation \* Main architectures and algorithms \* Models for Deep Learning \* Probabilistic graphic models \* Restricted Boltzmann Machines \* Deep Belief Networks \* Available Frameworks and libraries \* TensorFlow Hit download. Now!

**Deep Learning with Azure** Mathew Salvaris, Danielle Dean, Wee Hyong Tok, 2018-08-24 Get up-to-speed with Microsoft's AI Platform. Learn to innovate and accelerate with open and powerful tools and services that bring artificial intelligence to every data scientist and developer. Artificial Intelligence (AI) is the new normal. Innovations in deep learning algorithms and hardware are happening at a rapid pace. It is no longer a question of should I build AI into my business, but more about where do I begin and how do I get started with AI? Written by expert data scientists at Microsoft, Deep Learning with the Microsoft AI Platform helps you with the how-to of doing deep learning on Azure and leveraging deep learning to create innovative and intelligent solutions. Benefit from guidance on where to begin your AI adventure, and learn how the cloud provides you with all the tools, infrastructure, and services you need to do AI. What You'll Learn Become familiar with the tools, infrastructure, and services available for deep learning on Microsoft Azure such as Azure Machine Learning services and Batch AI Use pre-built AI capabilities (Computer Vision, OCR, gender, emotion, landmark detection, and more) Understand the common deep learning models, including convolutional neural networks (CNNs), recurrent neural networks (RNNs), generative adversarial networks (GANs) with sample code and understand how the field is evolving Discover the options for training and operationalizing deep learning models on Azure Who This Book Is For Professional data scientists who are interested in learning more about deep learning and how to use the Microsoft AI platform. Some experience with Python is helpful.

[Hands-On Computer Vision with TensorFlow 2](#) Benjamin Planche, Eliot Andres, 2019-05-30 A practical guide to building high performance systems for object detection, segmentation, video processing, smartphone applications, and more Key Features Discover how to build, train, and serve your own deep neural networks with TensorFlow 2 and Keras Apply modern solutions to a wide range of applications such as object detection and video analysis Learn how to run your models on mobile devices and web pages and improve their performance Book Description Computer vision solutions are becoming increasingly common, making their way into fields such as health, automobile, social media, and robotics. This book will help you explore TensorFlow 2, the brand new version of Google's open source framework for machine learning. You will understand how to benefit from using convolutional neural networks (CNNs) for visual tasks. Hands-On Computer Vision with TensorFlow 2 starts with the fundamentals of computer vision and deep learning, teaching you how to build a neural network from scratch.

You will discover the features that have made TensorFlow the most widely used AI library, along with its intuitive Keras interface. You'll then move on to building, training, and deploying CNNs efficiently. Complete with concrete code examples, the book demonstrates how to classify images with modern solutions, such as Inception and ResNet, and extract specific content using You Only Look Once (YOLO), Mask R-CNN, and U-Net. You will also build generative adversarial networks (GANs) and variational autoencoders (VAEs) to create and edit images, and long short-term memory networks (LSTMs) to analyze videos. In the process, you will acquire advanced insights into transfer learning, data augmentation, domain adaptation, and mobile and web deployment, among other key concepts. By the end of the book, you will have both the theoretical understanding and practical skills to solve advanced computer vision problems with TensorFlow 2.0. What you will learn

Create your own neural networks from scratch  
Classify images with modern architectures including Inception and ResNet  
Detect and segment objects in images with YOLO, Mask R-CNN, and U-Net  
Tackle problems faced when developing self-driving cars and facial emotion recognition systems  
Boost your application's performance with transfer learning, GANs, and domain adaptation  
Use recurrent neural networks (RNNs) for video analysis  
Optimize and deploy your networks on mobile devices and in the browser

Who this book is for  
If you're new to deep learning and have some background in Python programming and image processing, like reading/writing image files and editing pixels, this book is for you. Even if you're an expert curious about the new TensorFlow 2 features, you'll find this book useful. While some theoretical concepts require knowledge of algebra and calculus, the book covers concrete examples focused on practical applications such as visual recognition for self-driving cars and smartphone apps.

*Deep Learning and Neural Networks: Concepts, Methodologies, Tools, and Applications* Management Association, Information Resources, 2019-10-11

Due to the growing use of web applications and communication devices, the use of data has increased throughout various industries. It is necessary to develop new techniques for managing data in order to ensure adequate usage. Deep learning, a subset of artificial intelligence and machine learning, has been recognized in various real-world applications such as computer vision, image processing, and pattern recognition. The deep learning approach has opened new opportunities that can make such real-life applications and tasks easier and more efficient. *Deep Learning and Neural Networks: Concepts, Methodologies, Tools, and Applications* is a vital reference source that trends in data analytics and potential technologies that will facilitate insight in various domains of science, industry, business, and consumer applications. It also explores the latest concepts, algorithms, and techniques of deep learning and data mining and analysis. Highlighting a range of topics such as natural language processing, predictive analytics, and deep neural networks, this multi-volume book is ideally designed for computer engineers, software developers, IT professionals, academicians, researchers, and upper-level students seeking current research on the latest trends in the field of deep learning.

Neural Network Programming with TensorFlow Manpreet Singh Ghotra, Rajdeep Dua, 2017-11-10 *Neural Networks and*

their implementation decoded with TensorFlow About This Book Develop a strong background in neural network programming from scratch, using the popular Tensorflow library. Use Tensorflow to implement different kinds of neural networks - from simple feedforward neural networks to multilayered perceptrons, CNNs, RNNs and more. A highly practical guide including real-world datasets and use-cases to simplify your understanding of neural networks and their implementation. Who This Book Is For This book is meant for developers with a statistical background who want to work with neural networks. Though we will be using TensorFlow as the underlying library for neural networks, book can be used as a generic resource to bridge the gap between the math and the implementation of deep learning. If you have some understanding of Tensorflow and Python and want to learn what happens at a level lower than the plain API syntax, this book is for you. What You Will Learn Learn Linear Algebra and mathematics behind neural network. Dive deep into Neural networks from the basic to advanced concepts like CNN, RNN Deep Belief Networks, Deep Feedforward Networks. Explore Optimization techniques for solving problems like Local minima, Global minima, Saddle points Learn through real world examples like Sentiment Analysis. Train different types of generative models and explore autoencoders. Explore TensorFlow as an example of deep learning implementation. In Detail If you're aware of the buzz surrounding the terms such as machine learning, artificial intelligence, or deep learning, you might know what neural networks are. Ever wondered how they help in solving complex computational problem efficiently, or how to train efficient neural networks? This book will teach you just that. You will start by getting a quick overview of the popular TensorFlow library and how it is used to train different neural networks. You will get a thorough understanding of the fundamentals and basic math for neural networks and why TensorFlow is a popular choice Then, you will proceed to implement a simple feed forward neural network. Next you will master optimization techniques and algorithms for neural networks using TensorFlow. Further, you will learn to implement some more complex types of neural networks such as convolutional neural networks, recurrent neural networks, and Deep Belief Networks. In the course of the book, you will be working on real-world datasets to get a hands-on understanding of neural network programming. You will also get to train generative models and will learn the applications of autoencoders. By the end of this book, you will have a fair understanding of how you can leverage the power of TensorFlow to train neural networks of varying complexities, without any hassle. While you are learning about various neural network implementations you will learn the underlying mathematics and linear algebra and how they map to the appropriate TensorFlow constructs. Style and Approach This book is designed to give you just the right number of concepts to back up the examples. With real-world use cases and problems solved, this book is a handy guide for you. Each concept is backed by a generic and real-world problem, followed by a variation, making you independent and able to solve any problem with neural networks. All of the content is demystified by a simple and straightforward approach.

**Mastering TensorFlow 1.x** Armando Fandango, 2018-01-22 Build, scale, and deploy deep neural network models using



the star libraries in Python Key Features Delve into advanced machine learning and deep learning use cases using Tensorflow and Keras Build, deploy, and scale end-to-end deep neural network models in a production environment Learn to deploy TensorFlow on mobile, and distributed TensorFlow on GPU, Clusters, and Kubernetes Book Description TensorFlow is the most popular numerical computation library built from the ground up for distributed, cloud, and mobile environments. TensorFlow represents the data as tensors and the computation as graphs. This book is a comprehensive guide that lets you explore the advanced features of TensorFlow 1.x. Gain insight into TensorFlow Core, Keras, TF Estimators, TFLearn, TF Slim, Pretty Tensor, and Sonnet. Leverage the power of TensorFlow and Keras to build deep learning models, using concepts such as transfer learning, generative adversarial networks, and deep reinforcement learning. Throughout the book, you will obtain hands-on experience with varied datasets, such as MNIST, CIFAR-10, PTB, text8, and COCO-Images. You will learn the advanced features of TensorFlow1.x, such as distributed TensorFlow with TF Clusters, deploy production models with TensorFlow Serving, and build and deploy TensorFlow models for mobile and embedded devices on Android and iOS platforms. You will see how to call TensorFlow and Keras API within the R statistical software, and learn the required techniques for debugging when the TensorFlow API-based code does not work as expected. The book helps you obtain in-depth knowledge of TensorFlow, making you the go-to person for solving artificial intelligence problems. By the end of this guide, you will have mastered the offerings of TensorFlow and Keras, and gained the skills you need to build smarter, faster, and efficient machine learning and deep learning systems. What you will learn Master advanced concepts of deep learning such as transfer learning, reinforcement learning, generative models and more, using TensorFlow and Keras Perform supervised (classification and regression) and unsupervised (clustering) learning to solve machine learning tasks Build end-to-end deep learning (CNN, RNN, and Autoencoders) models with TensorFlow Scale and deploy production models with distributed and high-performance computing on GPU and clusters Build TensorFlow models to work with multilayer perceptrons using Keras, TFLearn, and R Learn the functionalities of smart apps by building and deploying TensorFlow models on iOS and Android devices Supercharge TensorFlow with distributed training and deployment on Kubernetes and TensorFlow Clusters Who this book is for This book is for data scientists, machine learning engineers, artificial intelligence engineers, and for all TensorFlow users who wish to upgrade their TensorFlow knowledge and work on various machine learning and deep learning problems. If you are looking for an easy-to-follow guide that underlines the intricacies and complex use cases of machine learning, you will find this book extremely useful. Some basic understanding of TensorFlow is required to get the most out of the book.

*Practical Computer Vision Applications Using Deep Learning with CNNs* Ahmed Fawzy Gad,2018-12-05 Deploy deep learning applications into production across multiple platforms. You will work on computer vision applications that use the convolutional neural network (CNN) deep learning model and Python. This book starts by explaining the traditional machine-

learning pipeline, where you will analyze an image dataset. Along the way you will cover artificial neural networks (ANNs), building one from scratch in Python, before optimizing it using genetic algorithms. For automating the process, the book highlights the limitations of traditional hand-crafted features for computer vision and why the CNN deep-learning model is the state-of-art solution. CNNs are discussed from scratch to demonstrate how they are different and more efficient than the fully connected ANN (FCNN). You will implement a CNN in Python to give you a full understanding of the model. After consolidating the basics, you will use TensorFlow to build a practical image-recognition model that you will deploy to a web server using Flask, making it accessible over the Internet. Using Kivy and NumPy, you will create cross-platform data science applications with low overheads. This book will help you apply deep learning and computer vision concepts from scratch, step-by-step from conception to production. What You Will Learn Understand how ANNs and CNNs work Create computer vision applications and CNNs from scratch using Python Follow a deep learning project from conception to production using TensorFlow Use NumPy with Kivy to build cross-platform data science applications Who This Book Is For Data scientists, machine learning and deep learning engineers, software developers.

*TensorFlow 1.x Deep Learning Cookbook* Antonio Gulli, Amita Kapoor, 2017-12-12 Take the next step in implementing various common and not-so-common neural networks with Tensorflow 1.x About This Book Skill up and implement tricky neural networks using Google's TensorFlow 1.x An easy-to-follow guide that lets you explore reinforcement learning, GANs, autoencoders, multilayer perceptrons and more. Hands-on recipes to work with Tensorflow on desktop, mobile, and cloud environment Who This Book Is For This book is intended for data analysts, data scientists, machine learning practitioners and deep learning enthusiasts who want to perform deep learning tasks on a regular basis and are looking for a handy guide they can refer to. People who are slightly familiar with neural networks, and now want to gain expertise in working with different types of neural networks and datasets, will find this book quite useful. What You Will Learn Install TensorFlow and use it for CPU and GPU operations Implement DNNs and apply them to solve different AI-driven problems. Leverage different data sets such as MNIST, CIFAR-10, and Youtube8m with TensorFlow and learn how to access and use them in your code. Use TensorBoard to understand neural network architectures, optimize the learning process, and peek inside the neural network black box. Use different regression techniques for prediction and classification problems Build single and multilayer perceptrons in TensorFlow Implement CNN and RNN in TensorFlow, and use it to solve real-world use cases. Learn how restricted Boltzmann Machines can be used to recommend movies. Understand the implementation of Autoencoders and deep belief networks, and use them for emotion detection. Master the different reinforcement learning methods to implement game playing agents. GANs and their implementation using TensorFlow. In Detail Deep neural networks (DNNs) have achieved a lot of success in the field of computer vision, speech recognition, and natural language processing. The entire world is filled with excitement about how deep networks are revolutionizing artificial intelligence. This exciting recipe-based

guide will take you from the realm of DNN theory to implementing them practically to solve the real-life problems in artificial intelligence domain. In this book, you will learn how to efficiently use TensorFlow, Google's open source framework for deep learning. You will implement different deep learning networks such as Convolutional Neural Networks (CNNs), Recurrent Neural Networks (RNNs), Deep Q-learning Networks (DQNs), and Generative Adversarial Networks (GANs) with easy to follow independent recipes. You will learn how to make Keras as backend with TensorFlow. With a problem-solution approach, you will understand how to implement different deep neural architectures to carry out complex tasks at work. You will learn the performance of different DNNs on some popularly used data sets such as MNIST, CIFAR-10, Youtube8m, and more. You will not only learn about the different mobile and embedded platforms supported by TensorFlow but also how to set up cloud platforms for deep learning applications. Get a sneak peek of TPU architecture and how they will affect DNN future. By using crisp, no-nonsense recipes, you will become an expert in implementing deep learning techniques in growing real-world applications and research areas such as reinforcement learning, GANs, autoencoders and more. Style and approach This book consists of hands-on recipes where you'll deal with real-world problems. You'll execute a series of tasks as you walk through data mining challenges using TensorFlow 1.x. Your one-stop solution for common and not-so-common pain points, this is a book that you must have on the shelf.

**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.

**Deep Learning for Social Media Data Analytics** Tzung-Pei Hong, Leticia Serrano-Estrada, Akрати Saxena, Anupam Biswas, 2022-09-18 This edited book covers ongoing research in both theory and practical applications of using deep learning for social media data. Social networking platforms are overwhelmed by different contents, and their huge amounts of data have enormous potential to influence business, politics, security, planning and other social aspects. Recently, deep learning techniques have had many successful applications in the AI field. The research presented in this book emerges from the conviction that there is still much progress to be made toward exploiting deep learning in the context of social media data analytics. It includes fifteen chapters, organized into four sections that report on original research in network structure analysis, social media text analysis, user behaviour analysis and social media security analysis. This work could serve as a good reference for researchers, as well as a compilation of innovative ideas and solutions for practitioners interested in applying deep learning techniques to social media data analytics.

**Advanced Deep Learning with Python** Ivan Vasilev, 2019-12-12 Gain expertise in advanced deep learning domains such as neural networks, meta-learning, graph neural networks, and memory augmented neural networks using the Python ecosystem Key Features Get to grips with building faster and more robust deep learning architectures Investigate and train convolutional neural network (CNN) models with GPU-accelerated libraries such as TensorFlow and PyTorch Apply deep neural networks (DNNs) to computer vision problems, NLP, and GANs Book Description In order to build robust deep learning systems, you'll need to understand everything from how neural networks work to training CNN models. In this book, you'll discover newly developed deep learning models, methodologies used in the domain, and their implementation based on areas of application. You'll start by understanding the building blocks and the math behind neural networks, and then move on to CNNs and their advanced applications in computer vision. You'll also learn to apply the most popular CNN architectures in object detection and image segmentation. Further on, you'll focus on variational autoencoders and GANs. You'll then use neural networks to extract sophisticated vector representations of words, before going on to cover various types of recurrent networks, such as LSTM and GRU. You'll even explore the attention mechanism to process sequential data

without the help of recurrent neural networks (RNNs). Later, you'll use graph neural networks for processing structured data, along with covering meta-learning, which allows you to train neural networks with fewer training samples. Finally, you'll understand how to apply deep learning to autonomous vehicles. By the end of this book, you'll have mastered key deep learning concepts and the different applications of deep learning models in the real world. What you will learn

Cover advanced and state-of-the-art neural network architectures  
Understand the theory and math behind neural networks  
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Implement generative adversarial networks (GANs) and variational autoencoders to generate new images  
Solve natural language processing (NLP) tasks, such as machine translation, using sequence-to-sequence models  
Understand DL techniques, such as meta-learning and graph neural networks

Who this book is for This book is for data scientists, deep learning engineers and researchers, and AI developers who want to further their knowledge of deep learning and build innovative and unique deep learning projects. Anyone looking to get to grips with advanced use cases and methodologies adopted in the deep learning domain using real-world examples will also find this book useful. Basic understanding of deep learning concepts and working knowledge of the Python programming language is assumed.

*Machine Learning for Mobile* Revathi Gopalakrishnan, Avinash Venkateswarlu, 2018-12-31 Leverage the power of machine learning on mobiles and build intelligent mobile applications with ease

Key Features  
Build smart mobile applications for Android and iOS devices  
Use popular machine learning toolkits such as Core ML and TensorFlow Lite  
Explore cloud services for machine learning that can be used in mobile apps

Book Description Machine learning presents an entirely unique opportunity in software development. It allows smartphones to produce an enormous amount of useful data that can be mined, analyzed, and used to make predictions. This book will help you master machine learning for mobile devices with easy-to-follow, practical examples. You will begin with an introduction to machine learning on mobiles and grasp the fundamentals so you become well-acquainted with the subject. You will master supervised and unsupervised learning algorithms, and then learn how to build a machine learning model using mobile-based libraries such as Core ML, TensorFlow Lite, ML Kit, and Fritz on Android and iOS platforms. In doing so, you will also tackle some common and not-so-common machine learning problems with regard to Computer Vision and other real-world domains. By the end of this book, you will have explored machine learning in depth and implemented on-device machine learning with ease, thereby gaining a thorough understanding of how to run, create, and build real-time machine-learning applications on your mobile devices. What you will learn

Build intelligent machine learning models that run on Android and iOS  
Use machine learning toolkits such as Core ML, TensorFlow Lite, and more  
Learn how to use Google Mobile Vision in your mobile apps  
Build a spam message detection system using Linear SVM  
Using Core ML to implement a regression model for iOS devices  
Build image classification systems using TensorFlow Lite and Core ML

Who this book is for If you are a mobile app developer or a machine learning enthusiast

keen to use machine learning to build smart mobile applications, this book is for you. Some experience with mobile application development is all you need to get started with this book. Prior experience with machine learning will be an added bonus

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