

Table of Contents

[Copyright](#)

[Brief Table of Contents](#)

[Table of Contents](#)

[Preface](#)

[Acknowledgments](#)

[About This Book](#)

[About the Author](#)

[About the Cover](#)

[1. Your machine-learning rig](#)

[Chapter 1. A machine-learning odyssey](#)

[1.1. Machine-learning fundamentals](#)

[1.1.1. Parameters](#)

[1.1.2. Learning and inference](#)

[1.2. Data representation and features](#)

[1.3. Distance metrics](#)

[1.4. Types of learning](#)

[1.4.1. Supervised learning](#)

[1.4.2. Unsupervised learning](#)

[1.4.3. Reinforcement learning](#)

[1.5. TensorFlow](#)

1.6. Overview of future chapters

1.7. Summary

Chapter 2. TensorFlow essentials

2.1. Ensuring that TensorFlow works

2.2. Representing tensors

2.3. Creating operators

2.4. Executing operators with sessions

2.4.1. Understanding code as a graph

2.4.2. Setting session configurations

2.5. Writing code in Jupyter

2.6. Using variables

2.7. Saving and loading variables

2.8. Visualizing data using TensorBoard

2.8.1. Implementing a moving average

2.8.2. Visualizing the moving average

2.9. Summary

2. Core learning algorithms

Chapter 3. Linear regression and beyond

3.1. Formal notation

3.1.1. How do you know the regression algorithm is working?

3.2. Linear regression

3.3. Polynomial model

3.4. Regularization

3.5. Application of linear regression

3.6. Summary

Chapter 4. A gentle introduction to classification

4.1. Formal notation

4.2. Measuring performance

4.2.1. Accuracy

4.2.2. Precision and recall

4.2.3. Receiver operating characteristic curve

4.3. Using linear regression for classification

4.4. Using logistic regression

4.4.1. Solving one-dimensional logistic regression

4.4.2. Solving two-dimensional logistic regression

4.5. Multiclass classifier

4.5.1. One-versus-all

4.5.2. One-versus-one

4.5.3. Softmax regression

4.6. Application of classification

4.7. Summary

Chapter 5. Automatically clustering data

5.1. Traversing files in TensorFlow

5.2. Extracting features from audio

5.3. K-means clustering

5.4. Audio segmentation

5.5. Clustering using a self-organizing map

5.6. Application of clustering

5.7. Summary

Chapter 6. Hidden Markov models

6.1. Example of a not-so-interpretable model

6.2. Markov model

6.3. Hidden Markov model

6.4. Forward algorithm

6.5. Viterbi decoding

6.6. Uses of hidden Markov models

6.6.1. Modeling a video

6.6.2. Modeling DNA

6.6.3. Modeling an image

6.7. Application of hidden Markov models

6.8. Summary

3. The neural network paradigm

Chapter 7. A peek into autoencoders

7.1. Neural networks

7.2. Autoencoders

7.3. Batch training

7.4. Working with images

7.5. Application of autoencoders

7.6. Summary

Chapter 8. Reinforcement learning

8.1. Formal notions

8.1.1. Policy

8.1.2. Utility

8.2. Applying reinforcement learning

8.3. Implementing reinforcement learning

8.4. Exploring other applications of reinforcement learning

8.5. Summary

Chapter 9. Convolutional neural networks

9.1. Drawback of neural networks

9.2. Convolutional neural networks

9.3. Preparing the image

[9.3.1. Generating filters](#)

[9.3.2. Convolving using filters](#)

[9.3.3. Max pooling](#)

[9.4. Implementing a convolutional neural network in TensorFlow](#)

[9.4.1. Measuring performance](#)

[9.4.2. Training the classifier](#)

[9.5. Tips and tricks to improve performance](#)

[9.6. Application of convolutional neural networks](#)

[9.7. Summary](#)

[Chapter 10. Recurrent neural networks](#)

[10.1. Contextual information](#)

[10.2. Introduction to recurrent neural networks](#)

[10.3. Implementing a recurrent neural network](#)

[10.4. A predictive model for time-series data](#)

[10.5. Application of recurrent neural networks](#)

[10.6. Summary](#)

[Chapter 11. Sequence-to-sequence models for chatbots](#)

[11.1. Building on classification and RNNs](#)

[11.2. Seq2seq architecture](#)

[11.3. Vector representation of symbols](#)

[11.4. Putting it all together](#)

[11.5. Gathering dialogue data](#)

[11.6. Summary](#)

[Chapter 12. Utility landscape](#)

[12.1. Preference model](#)

[12.2. Image embedding](#)

[12.3. Ranking images](#)

[12.4. Summary](#)

[12.5. What's next?](#)

[Installation](#)

[A.1. Installing TensorFlow by using Docker](#)

[A.1.1. Installing Docker on Windows](#)

[A.1.2. Installing Docker on Linux](#)

[A.1.3. Installing Docker on macOS](#)

[A.1.4. How to use Docker](#)

[A.2. Installing Matplotlib](#)

[Index](#)

[List of Figures](#)

[List of Tables](#)

[List of Listings](#)

[Recommended](#) / [Playlists](#) / [History](#) / [Topics](#) / [Tutorials](#) / [Settings](#) / [Get the App](#) / [Sign Out](#)



PREV

[Brief Table of Contents](#)

NEXT

[Preface](#)

