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E R Mudiyansele Samanthi Chathurani Ekanayake

FOR SUCCESSFULLY COMPLETING


Introduction to Deep Learning in Python


LENGTH

4 HOURS

COMPLETED ON

FEB 09, 2024

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Jonathan Cornelissen, CEO

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1 Basics of deep learning and neural networks

100%

In this chapter, you'll become familiar with the fundamental concepts and terminology used in deep learning, and understand why deep learning techniques are so powerful today. You'll build simple neural networks and generate predictions with them.

Hide Chapter Details

Complete

Introduction to deep learning

50 XP

Comparing neural network models to classical regression models

50 XP

Forward propagation

50 XP

Coding the forward propagation algorithm

100 XP

Activation functions

50 XP

The Rectified Linear Activation Function

100 XP

Applying the network to many observations/rows of data

100 XP

Deeper networks

50 XP

Forward propagation in a deeper network

50 XP

Multi-layer neural networks

100 XP

Representations are learned

50 XP

Levels of representation

50 XP

2 Optimizing a neural network with backward propagation

100%

Learn how to optimize the predictions generated by your neural networks. You'll use a method called backward propagation, which is one of the most important techniques in deep learning. Understanding how it works will give you a strong foundation

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Dan Becker

Data Scientist and contributor to Keras and TensorFlow libraries

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Optimizing a neural network with backward propagation

100%

Learn how to optimize the predictions generated by your neural networks. You'll use a method called backward propagation, which is one of the most important techniques in deep learning. Understanding how it works will give you a strong foundation to build on in the second half of the course.

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Complete

The need for optimization

60 XP

Calculating model errors

60 XP

Understanding how weights change model accuracy

60 XP

Coding how weight changes affect accuracy

100 XP

Scaling up to multiple data points

100 XP

Gradient descent

60 XP

Calculating slopes

100 XP

Improving model weights

100 XP

Making multiple updates to weights

100 XP

Backpropagation

60 XP

The relationship between forward and backward propagation

60 XP

Thinking about backward propagation

60 XP

Backpropagation in practice

60 XP

A round of backpropagation

60 XP

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A round of backpropagation

50 XP

3

Building deep learning models with keras

100%

In this chapter, you'll use the Keras library to build deep learning models for both regression and classification. You'll learn about the Specify-Compile-Fit workflow that you can use to make predictions, and by the end of the chapter, you'll have all the tools necessary to build deep neural networks.

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Complete

Creating a Keras model

50 XP

Understanding your data

50 XP

Specifying a model

100 XP

Compiling and fitting a model

50 XP

Compiling the model

100 XP

Fitting the model

100 XP

Classification models

50 XP

Understanding your classification data

50 XP

Last steps in classification models

100 XP

Using models

50 XP

Making predictions

100 XP

4

Fine-tuning keras models

100%

Learn how to optimize your deep learning models in Keras. Start by learning how to validate your models, then understand the concept of model capacity, and finally, experiment with wider and deeper networks.

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Making predictions

100 XP

4

Fine-tuning keras models

100%

Learn how to optimize your deep learning models in Keras. Start by learning how to validate your models, then understand the concept of model capacity, and finally, experiment with wider and deeper networks.

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Understanding model optimization

50 XP

Diagnosing optimization problems

50 XP

Changing optimization parameters

100 XP

Model validation

50 XP

Evaluating model accuracy on validation dataset

100 XP

Early stopping: Optimizing the optimization

100 XP

Experimenting with wider networks

100 XP

Adding layers to a network

100 XP

Thinking about model capacity

50 XP

Experimenting with model structures

50 XP

Stepping up to Images

50 XP

Building your own digit recognition model

100 XP

Final thoughts

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Course Description

Deep learning is the machine learning technique behind the most exciting capabilities in diverse areas like robotics, natural language processing, image recognition, and artificial intelligence, including the famous AlphaGo. In this course, you'll gain hands-on, practical knowledge of how to use deep learning with Keras 2.0, the latest version of a cutting-edge library for deep learning in Python.

Read More

Basics of deep learning and neural networks

100%

In this chapter, you'll become familiar with the fundamental concepts and terminology used in deep learning, and understand why deep learning techniques are so powerful today. You'll build simple neural networks and generate predictions with them.

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