uCertify

Course Outline

Deep Learning

03 Jul 2024

1. Course Objective

2. Exercises, Quizzes, Flashcards & Glossary

   Number of Questions

3. Expert Instructor-Led Training

4. ADA Compliant & JAWS Compatible Platform

5. State of the Art Educator Tools

6. Award Winning Learning Platform (LMS)

7. Chapter & Lessons

   Syllabus

   Chapter 1: Introduction

   Chapter 2: Introducing Deep Learning

   Chapter 3: Introducing the Machine Learning Principles

   Chapter 4: Getting and Using Python

   Chapter 5: Leveraging a Deep Learning Framework

   Chapter 6: Reviewing Matrix Math and Optimization

   Chapter 7: Laying Linear Regression Foundations

   Chapter 8: Introducing Neural Networks

   Chapter 9: Building a Basic Neural Network

   Chapter 10: Moving to Deep Learning

   Chapter 11: Explaining Convolutional Neural Networks

   Chapter 12: Introducing Recurrent Neural Networks

   Chapter 13: Performing Image Classification

   Chapter 14: Learning Advanced CNNs

   Chapter 15: Working on Language Processing

   Chapter 16: Generating Music and Visual Art

   Chapter 17: Building Generative Adversarial Networks

   Chapter 18: Playing with Deep Reinforcement Learning

   Chapter 19: Ten Applications that Require Deep Learning

1. 📖 Course Objective

The Deep Learning course provides you with the knowledge and skills to excel in this rapidly advancing field. Explore the foundational principles of deep learning, including neural networks, activation functions, and backpropagation and gain a solid understanding of the mathematical concepts behind deep learning architectures. This course helps you explore advanced techniques such as transfer learning and leverage pre-trained models to accelerate your deep learning projects and understand how to adapt existing models to new tasks effectively.

2. ⚡ flashcards

Flashcards are effective memory-aiding tools that help you learn complex topics easily. The flashcard will help you in memorizing definitions, terminologies, key concepts, and more. There is no limit to the number of times learners can attempt these. Flashcards help master the key concepts.

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FLASHCARDS
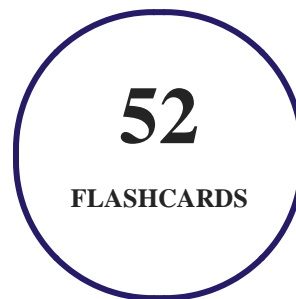
3. 📖 Glossary of terms

uCertify provides detailed explanations of concepts relevant to the course through Glossary. It contains a list of frequently used terminologies along with its detailed explanation. Glossary defines the key terms.

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GLOSSARY OF TERMS

4. Expert Instructor-Led Training

uCertify uses the content from the finest publishers and only the IT industry's finest instructors. They have a minimum of 15 years real-world experience and are subject matter experts in their fields. Unlike a live class, you can study at your own pace. This creates a personal learning experience and gives you all the benefit of hands-on training with the flexibility of doing it around your schedule 24/7.

5. ADA Compliant & JAWS Compatible Platform

uCertify course and labs are ADA (Americans with Disability Act) compliant. It is now more accessible to students with features such as:

- Change the font, size, and color of the content of the course
- Text-to-speech, reads the text into spoken words
- Interactive videos, how-tos videos come with transcripts and voice-over
- Interactive transcripts, each word is clickable. Students can clip a specific part of the video by clicking on a word or a portion of the text.

JAWS (Job Access with Speech) is a computer screen reader program for Microsoft Windows that reads the screen either with a text-to-speech output or by a Refreshable Braille display. Student can easily navigate uCertify course using JAWS shortcut keys.

6. State of the Art Educator Tools

uCertify knows the importance of instructors and provide tools to help them do their job effectively. Instructors are able to clone and customize course. Do ability grouping. Create sections. Design grade scale and grade formula. Create and schedule assessments. Educators can also move a student from self-paced to mentor-guided to instructor-led mode in three clicks.

7. Award Winning Learning Platform (LMS)

uCertify has developed an award winning, highly interactive yet simple to use platform. The SIIA CODiE Awards is the only peer-reviewed program to showcase business and education technology's finest products and services. Since 1986, thousands of products, services and solutions have been

recognized for achieving excellence. uCertify has won CODiE awards consecutively for last 7 years:

- **2014**
    1. Best Postsecondary Learning Solution

- **2015**
    1. Best Education Solution
    2. Best Virtual Learning Solution
    3. Best Student Assessment Solution
    4. Best Postsecondary Learning Solution
    5. Best Career and Workforce Readiness Solution
    6. Best Instructional Solution in Other Curriculum Areas
    7. Best Corporate Learning/Workforce Development Solution

- **2016**
    1. Best Virtual Learning Solution
    2. Best Education Cloud-based Solution
    3. Best College and Career Readiness Solution
    4. Best Corporate / Workforce Learning Solution
    5. Best Postsecondary Learning Content Solution
    6. Best Postsecondary LMS or Learning Platform
    7. Best Learning Relationship Management Solution

- **2017**
    1. Best Overall Education Solution
    2. Best Student Assessment Solution
    3. Best Corporate/Workforce Learning Solution
    4. Best Higher Education LMS or Learning Platform

- **2018**
    1. Best Higher Education LMS or Learning Platform

2. Best Instructional Solution in Other Curriculum Areas

3. Best Learning Relationship Management Solution

- **2019**

    1. Best Virtual Learning Solution

    2. Best Content Authoring Development or Curation Solution

    3. Best Higher Education Learning Management Solution (LMS)

- **2020**

    1. Best College and Career Readiness Solution

    2. Best Cross-Curricular Solution

    3. Best Virtual Learning Solution

8. Chapter & Lessons

uCertify brings these textbooks to life. It is full of interactive activities that keeps the learner engaged. uCertify brings all available learning resources for a topic in one place so that the learner can efficiently learn without going to multiple places. Challenge questions are also embedded in the chapters so learners can attempt those while they are learning about that particular topic. This helps them grasp the concepts better because they can go over it again right away which improves learning.

Learners can do Flashcards, Exercises, Quizzes and Labs related to each chapter. At the end of every lesson, uCertify courses guide the learners on the path they should follow.

Syllabus

Chapter 1: Introduction

- About This Course

- Icons Used in This Course

- Where to Go from Here

Chapter 2: Introducing Deep Learning

- Defining What Deep Learning Means

- Using Deep Learning in the Real World

- Considering the Deep Learning Programming Environment

- Overcoming Deep Learning Hype

Chapter 3: Introducing the Machine Learning Principles

- Defining Machine Learning

- Considering the Many Different Roads to Learning

- Pondering the True Uses of Machine Learning

Chapter 4: Getting and Using Python

- Working with Python in this Course

- Obtaining Your Copy of Anaconda

- Downloading the Datasets and Example Code

- Creating the Application

- Understanding the Use of Indentation

- Adding Comments

- Getting Help with the Python Language

- Working in the Cloud

Chapter 5: Leveraging a Deep Learning Framework

- Presenting Frameworks

- Working with Low-End Frameworks

- Understanding TensorFlow

Chapter 6: Reviewing Matrix Math and Optimization

- Revealing the Math You Really Need

- Understanding Scalar, Vector, and Matrix Operations

- Interpreting Learning as Optimization

Chapter 7: Laying Linear Regression Foundations

- Combining Variables

- Mixing Variable Types

- Switching to Probabilities

- Guessing the Right Features

- Learning One Example at a Time

Chapter 8: Introducing Neural Networks

- Discovering the Incredible Perceptron

- Hitting Complexity with Neural Networks

- Struggling with Overfitting

Chapter 9: Building a Basic Neural Network

- Understanding Neural Networks

- Looking Under the Hood of Neural Networks

Chapter 10: Moving to Deep Learning

- Seeing Data Everywhere

- Discovering the Benefits of Additional Data

- Improving Processing Speed

- Explaining Deep Learning Differences from Other Forms of AI

- Finding Even Smarter Solutions

Chapter 11: Explaining Convolutional Neural Networks

- Beginning the CNN Tour with Character Recognition

- Using AI for Sentiment Analysis

Chapter 16: Generating Music and Visual Art

- Learning to Imitate Art and Life

- Mimicking an Artist

Chapter 17: Building Generative Adversarial Networks

- Making Networks Compete

- Considering a Growing Field

Chapter 18: Playing with Deep Reinforcement Learning

- Playing a Game with Neural Networks

- Explaining Alpha-Go

Chapter 19: Ten Applications that Require Deep Learning

- Restoring Color to Black-and-White Videos and Pictures

- Approximating Person Poses in Real Time

- Performing Real-Time Behavior Analysis

- Translating Languages

- Estimating Solar Savings Potential

- Beating People at Computer Games

- Generating Voices

- Predicting Demographics

- Creating Art from Real-World Pictures

- Forecasting Natural Catastrophes

Chapter 20: Ten Must-Have Deep Learning Tools

- Compiling Math Expressions Using Theano

- Augmenting TensorFlow Using Keras

- Dynamically Computing Graphs with Chainer

- Creating a MATLAB-Like Environment with Torch

- Performing Tasks Dynamically with PyTorch

- Accelerating Deep Learning Research Using CUDA

- Supporting Business Needs with Deeplearning4j

- Mining Data Using Neural Designer

- Training Algorithms Using Microsoft Cognitive Toolkit (CNTK)

- Exploiting Full GPU Capability Using MXNet

- Managing People

- Improving Medicine

- Developing New Devices

- Providing Customer Support

- Seeing Data in New Ways

- Performing Analysis Faster

- Creating a Better Work Environment

- Researching Obscure or Detailed Information

- Designing Buildings

- Enhancing Safety

9. Live Labs

The benefits of live-labs are:

- Exam based practical tasks
- Real equipment, absolutely no simulations
- Access to the latest industry technologies
- Available anytime, anywhere on any device
- Break and Reset functionality
- No hardware costs

Lab Tasks

Getting and Using Python

- Exploring Jupyter Notebook
- Understanding Cells of Jupyter Notebook
- Understanding Indentation and Adding Comments in a Notebook

Leveraging a Deep Learning Framework

Reviewing Matrix Math and Optimization

- Working with Matrices

Laying Linear Regression Foundations

- Analyzing Data Using Linear Regression
- Using Polynomial Expansion to Model Complex Relations
- Analyzing Data Using Logistic Regression

Introducing Neural Networks

Building a Basic Neural Network

- Creating a Neural Network Model

Explaining Convolutional Neural Networks

- Building a LeNet5 Network

Performing Image Classification

- Creating an Image Classifier Using CNNs

Working on Language Processing

- Processing Text Using NLP
- Building a Sentiment Analysis Algorithm Using RNNs

Here's what you get

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LIVE LABS	VIDEO TUTORIALS	MINUTES

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