uCertify

Course Outline

Hands-On Machine Learning For Cybersecurity

20 May 2024

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Here's what you get

1. 📖 Course Objective

Explore the fundamentals of machine learning and understand its application in the cybersecurity landscape and learn how to prepare and optimize data for machine learning, extracting valuable features for effective threat detection. Whether you're a cybersecurity professional, IT enthusiast, or someone looking to enter the field, Hands-On Machine Learning For Cybersecurity course is your gateway to mastering machine learning for cybersecurity.

2. 📋 Pre-Assessment

Pre-Assessment lets you identify the areas for improvement before you start your prep. It determines what students know about a topic before it is taught and identifies areas for improvement with question assessment before beginning the course.

3. ⊕ Exercises

There is no limit to the number of times learners can attempt these. Exercises come with detailed remediation, which ensures that learners are confident on the topic before proceeding.

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EXERCISES

4. ⏱ Quiz

Quizzes test your knowledge on the topics of the exam when you go through the course material. There is no limit to the number of times you can attempt it.

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QUIZ

5. ⚡ 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
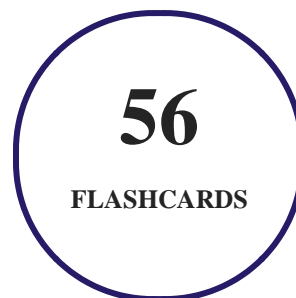
6. 📖 Glossary of terms

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

7. 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.

8. 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.

9. 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.

10. 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

11. ⚙ 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: Preface

- Who this course is for

- What this course covers

- To get the most out of this course

Chapter 2: Basics of Machine Learning in Cybersecurity

- What is machine learning?

- Summary

Chapter 3: Time Series Analysis and Ensemble Modeling

- What is a time series?

- Classes of time series models

- Time series decomposition

- Use cases for time series

- Time series analysis in cybersecurity

- Time series trends and seasonal spikes

- Predicting DDoS attacks

- Ensemble learning methods

- Voting ensemble method to detect cyber attacks

- Summary

Chapter 4: Segregating Legitimate and Lousy URLs

- Introduction to the types of abnormalities in URLs

- Dealing with lateral movement in networks

- Using Windows event logs to detect network anomalies

- Ingesting active directory data

- Data parsing

- Modeling

- Detecting anomalies in a network with k-means

- Summary

Chapter 8: Decision Tree and Context-Based Malicious Event Detection

- Adware

- Bots

- Bugs

- Ransomware

- Rootkit

- Spyware

- Trojan horses

- Viruses

- Worms

- Malicious data injection within databases

- Malicious injections in wireless sensors

- Use case

- Revisiting malicious URL detection with decision trees

- Summary

Chapter 9: Catching Impersonators and Hackers Red Handed

- Understanding impersonation

- Different types of impersonation fraud

- Levenshtein distance

- Summary

Chapter 10: Changing the Game with TensorFlow

- Introduction to TensorFlow

- Installation of TensorFlow

- TensorFlow for Windows users

- Hello world in TensorFlow

- Importing the MNIST dataset

- Computation graphs

- Tensor processing unit

- Using TensorFlow for intrusion detection

- Summary

Chapter 11: Financial Fraud and How Deep Learning Can Mitigate It

- Machine learning to detect financial fraud

- Logistic regression classifier – under-sampled data

- Deep learning time

- Summary

Chapter 12: Case Studies

- Introduction to our password dataset

- Summary

12. ◎ Practice Test

Here's what you get

Features

Each question comes with detailed remediation explaining not only why an answer option is correct but also why it is incorrect.

Unlimited Practice

Each test can be taken unlimited number of times until the learner feels they are prepared. Learner can review the test and read detailed remediation. Detailed test history is also available.

Each test set comes with learn, test and review modes. In learn mode, learners will attempt a question and will get immediate feedback and complete remediation as they move on to the next question. In test mode, learners can take a timed test simulating the actual exam conditions. In review mode, learners can read through one item at a time without attempting it.

13. 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

Time Series Analysis and Ensemble Modeling

- Creating a Time Series Model to Predict DDoS Attacks
- Detecting Cyber Attacks Using the Voting Ensemble Method

Segregating Legitimate and Lousy URLs

- Using Heuristics to Detect Malicious Pages
- Comparing Different ML Models to Detect Malicious URLs
- Using a Multiclass Classifier to Detect Malicious URLs

Using Data Science to Catch Email Fraud and Spam

- Using Logistic Regression to Detect Spam SMS
- Creating a Naive Bayes Spam Classifier

Efficient Network Anomaly Detection Using k-means

- Using k-Means to Detect Anomalies in a Network

Decision Tree and Context-Based Malicious Event Detection

- Using Decision Trees and Random Forests for Classifying Malicious Data
- Detecting Rootkits
- Exploiting a Website Using SQL Injection
- Detecting Anomaly Using Isolation Forest
- Detecting Malicious URL With Decision Trees

Catching Impersonators and Hackers Red Handed

- Using Authorship Attribution for Detecting Real Tweets

Financial Fraud and How Deep Learning Can Mitigate It

- Detecting Credit Card Fraud
- Building a Logistic Regression Classifier for Under-Sampled Data
- Building a Logistic Regression Classifier for Skewed Data
- Building a Deep Learning Classifier for Under-Sampled Data

Case Studies

- Creating a Password Tester

Here's what you get

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LIVE LABS	VIDEO TUTORIALS	MINUTES

GET IN TOUCH:

3187 Independence Drive
Livermore, CA 94551,
United States

+1-415-763-6300

support@ucertify.com

www.ucertify.com