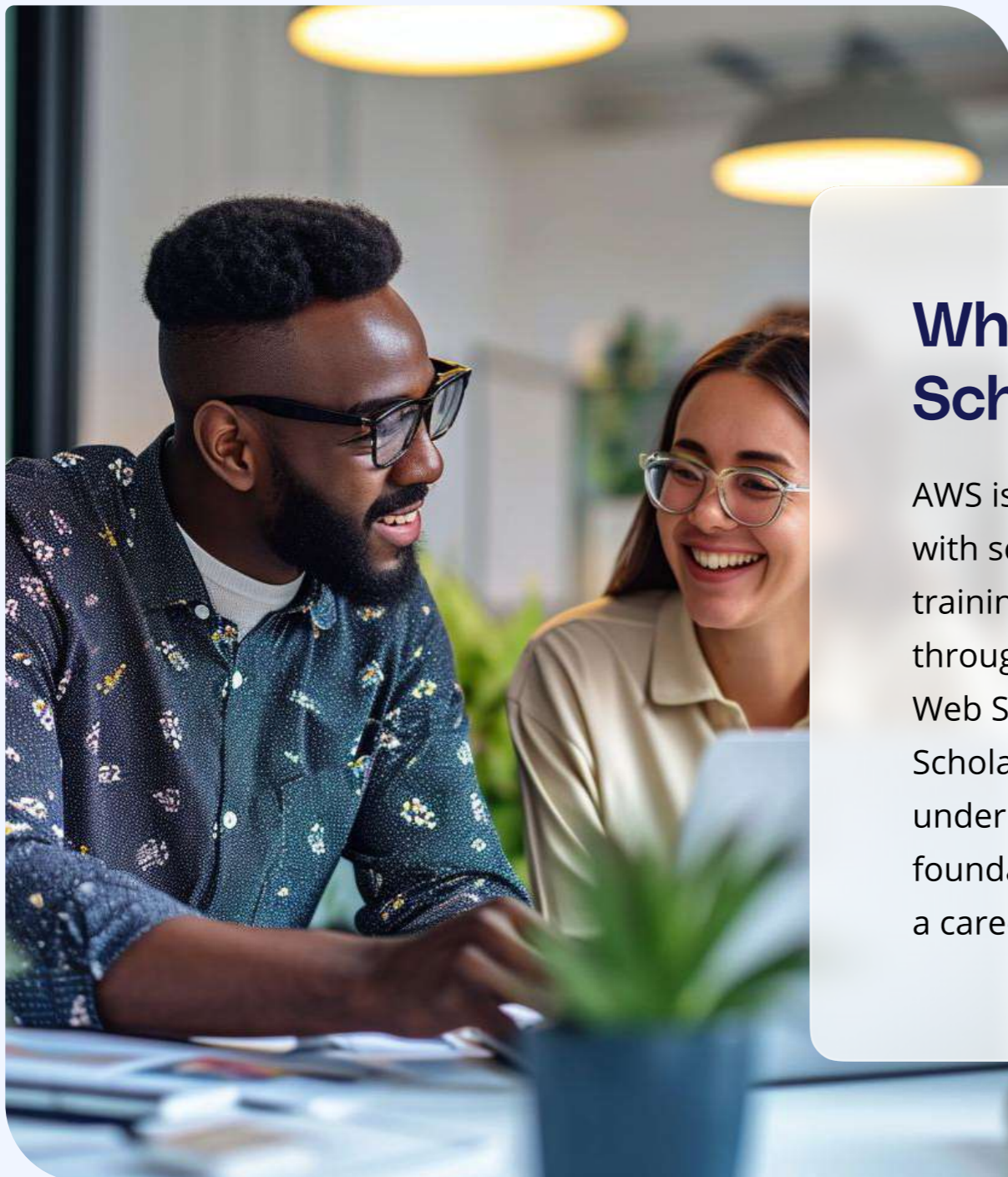# UDACITY

AWS AI & ML Scholarship

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What is the AWS AI & ML Scholarship?

AWS is teaming up with Udacity to award 2,500 students with scholarships in 2024. Students learn in-demand AI/ML training, enabling hands-on skills and career advancement through industry mentorships and support. The Amazon Web Services Artificial Intelligence & Machine Learning Scholarship program aims to help students who are underrepresented and underserved in tech learn foundational machine learning concepts as they prepare for a career in one of today's hottest and fastest-growing fields.

What will you gain from this guide?

This is a comprehensive document that outlines various skills relevant to the AWS AI & ML Scholarship Program. It helps individuals understand the skills required to successfully graduate from the program. This guide provides detailed information about the courses offered, the skills learners will develop, the prerequisites needed, and the duration of each course.

Udacity Courses Covered in the Scholarship

AI Programming with Python

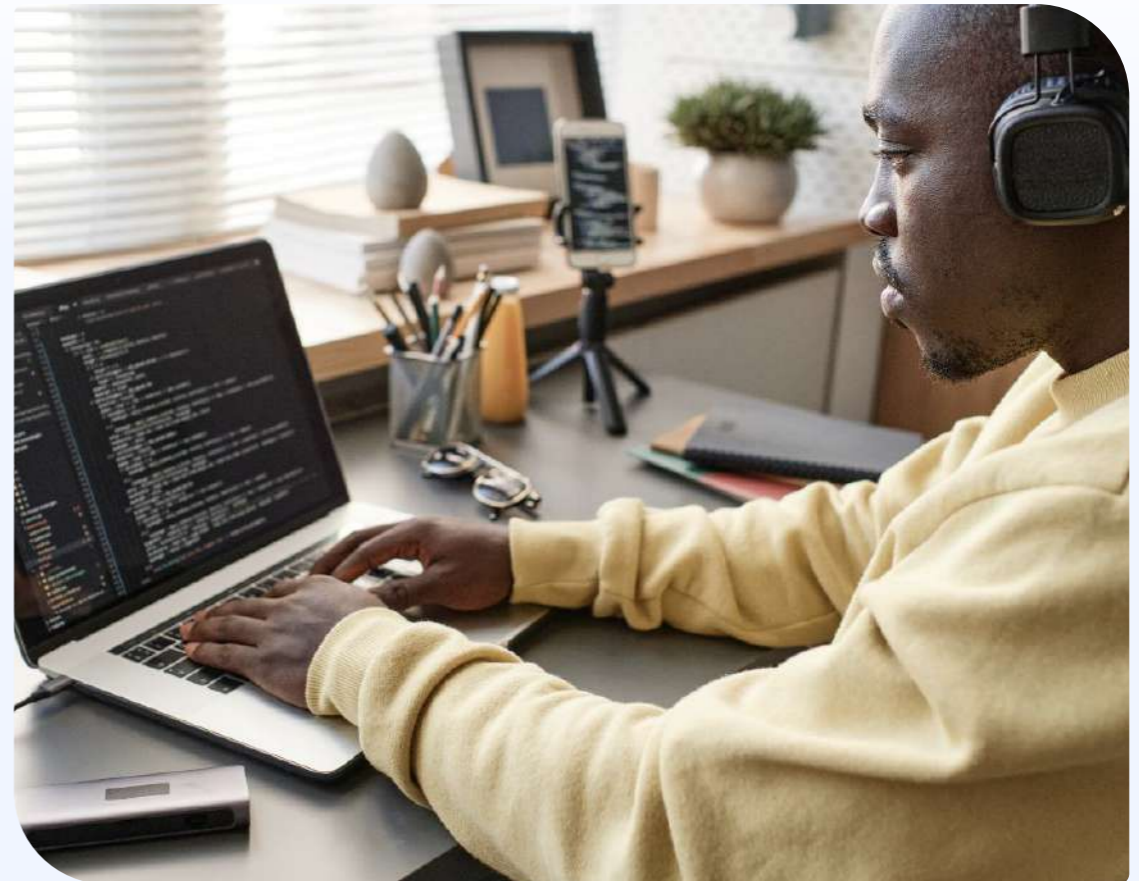AWS Machine Learning Fundamentals

Introducing Generative AI with AWS

AI Programming with Python

Overview

In this program, learners will build the essential foundations of AI: the programming tools, the math, and the key techniques of neural networks.

Learning Objectives

A graduate of this program will be able to:

- Utilize programming tools like Python, NumPy, and PyTorch

- Understand Calculus and linear algebra applications

- Perform key techniques of neural networks, including gradient descent and backpropagation

PREREQUISITES

Learners should have basic calculus knowledge, including how to calculate derivatives. Basic algebra and programming knowledge will shorten the time to mastery.
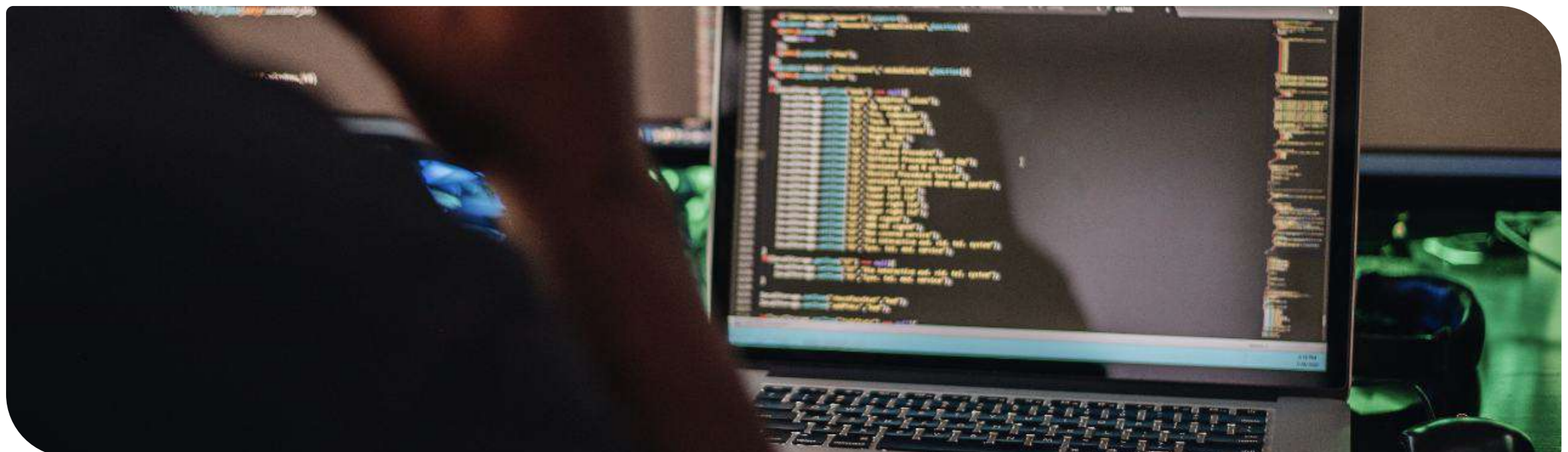
DURATION

3-4 months at 5-10hrs/week

LEVEL

Beginner

REQUIRED HARDWARE/SOFTWARE

Learners need access to a computer running OS X or Windows.

Courses, Projects, and Skills

1. Introduction to AI Programming

Project: Use a Pre-trained Image Classifier to Identify Dog Breeds

SKILLS

- Control flow
- Variable scope
- User input handling
- Loops
- Lambda expressions
- Generators
- File I/O
- Docstrings
- Code Debugging
- Classes
- Python operators
- Python data types
- Python scripting
- Python function definition
- Python exception handling
- Python data structures
- Pop
- List comprehension
- Built-in Python functions

2. Anaconda, Jupiter, Notebook, Numpy, Pandas, Matplotlib

SKILLS

- Pandas
- Python package management
- Numpy
- Jupyter Notebooks
- Anaconda
- AI algorithms in Python

3. Linear Algebra Essentials

SKILLS

- Numpy
- Matplotlib
- Systems of linear equations
- Matrix multiplication
- Linear algebra
- Vector visualization

4. Calculus Essentials

SKILLS

- Limits of functions
- Integrals
- Implicit differentiation
- Derivatives
- Chain rule application
- Gradient descent
- Backpropagation

## 5. Neural Networks

Project: Create Your Own Image Classifier

SKILLS

- Training neural networks
- Backpropagation
- Pytorch
- AI algorithms in Python
- Gradient descent

AWS Machine Learning Fundamentals

Overview

This course covers the fundamentals of Machine Learning and Deep Learning. Students will learn to build intelligent systems using Python and popular data science libraries and will gain hands-on experience by developing a machine learning workflow on a real-world dataset. By the end of the course, students will have a solid understanding of the basics of Machine Learning and Deep Learning.
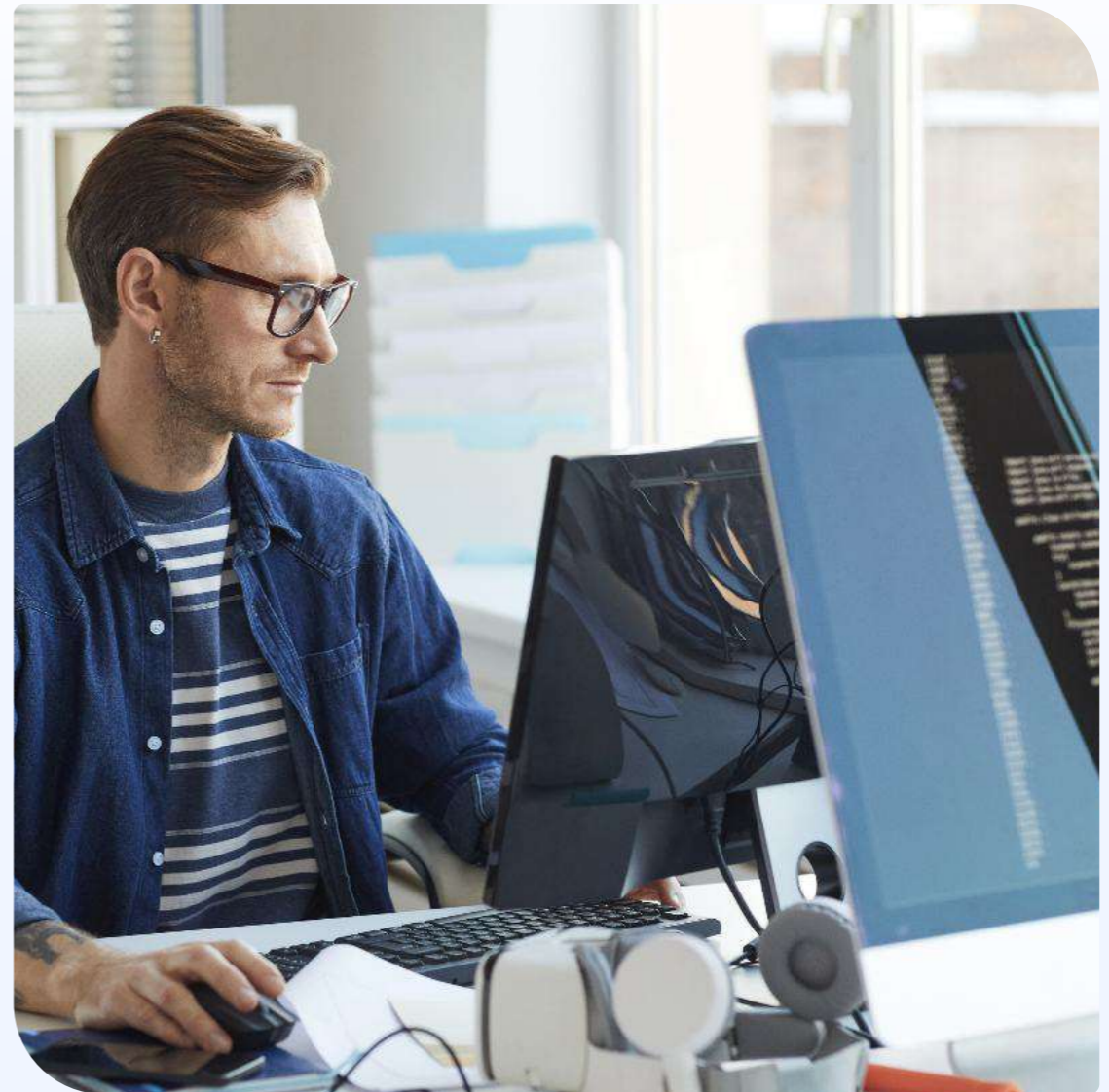
PREREQUISITES

Python programming knowledge, including:

- At least 40 hours of programming experience.

- Familiarity with data structures like dictionaries and lists.

- Experience with libraries like NumPy and pandas.

- Knowledge of functions, variables, loops, and classes.

- Exposure to Python through Jupyter Notebooks is recommended.

Experience with constructing and calling HTTP API endpoints is recommended.

Basic knowledge of machine learning algorithms, including:

- Basic understanding of the machine learning workflow.

- Basic theoretical understanding of ML algorithms such as linear regression, logistic regression, and neural network.

- Basic understanding of model training and* testing processes.

- Basic knowledge of commonly used metrics for ML models evaluation such as accuracy, precision, recall, and mean square error (MSE).

DURATION

4-6 months at 5-10hrs/week

LEVEL

Intermediate

LEVEL REQUIRED HARDWARE/SOFTWARE

Learners need access to a computer running OS X or Windows.

Courses, Projects, and Skills

1. Introduction to Machine Learning

Project: Predict Bike Sharing Demand with AutoGluon

SKILLS

- Model development workflow
- Model training, testing, validation
- EDA
- AutoGluon framework
- SageMaker studio

2. Intro to Deep Learning

Project: Developing a Hand Written Digits Classifier with PyTorch

SKILLS

- Deep learning essentials
- Feed forward/backward
- Perceptrons (multiplayer)
- Gradient descent
- Logistic regression
- ML fine tuning parameters
- Pytorch

3. Convolutional Neural Networks

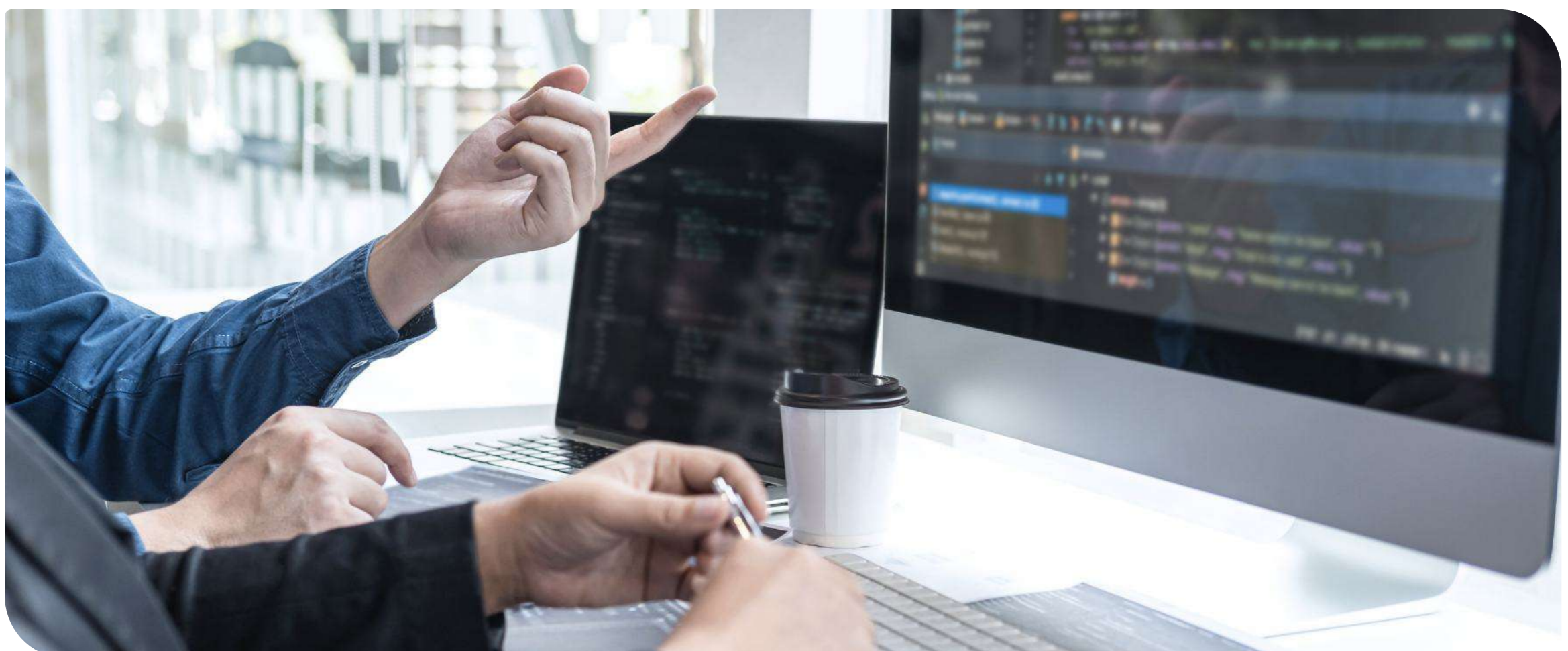Project: Landmark Classification and Tagging for Social Media

SKILLS

- CNN fundamentals
- Transfer learning
- Auto encoders
- Object detection
- Object segmentation

4. Developing your First ML workflow

Project: Build a ML Workflow for Scones Unlimited on AWS Sagemaker
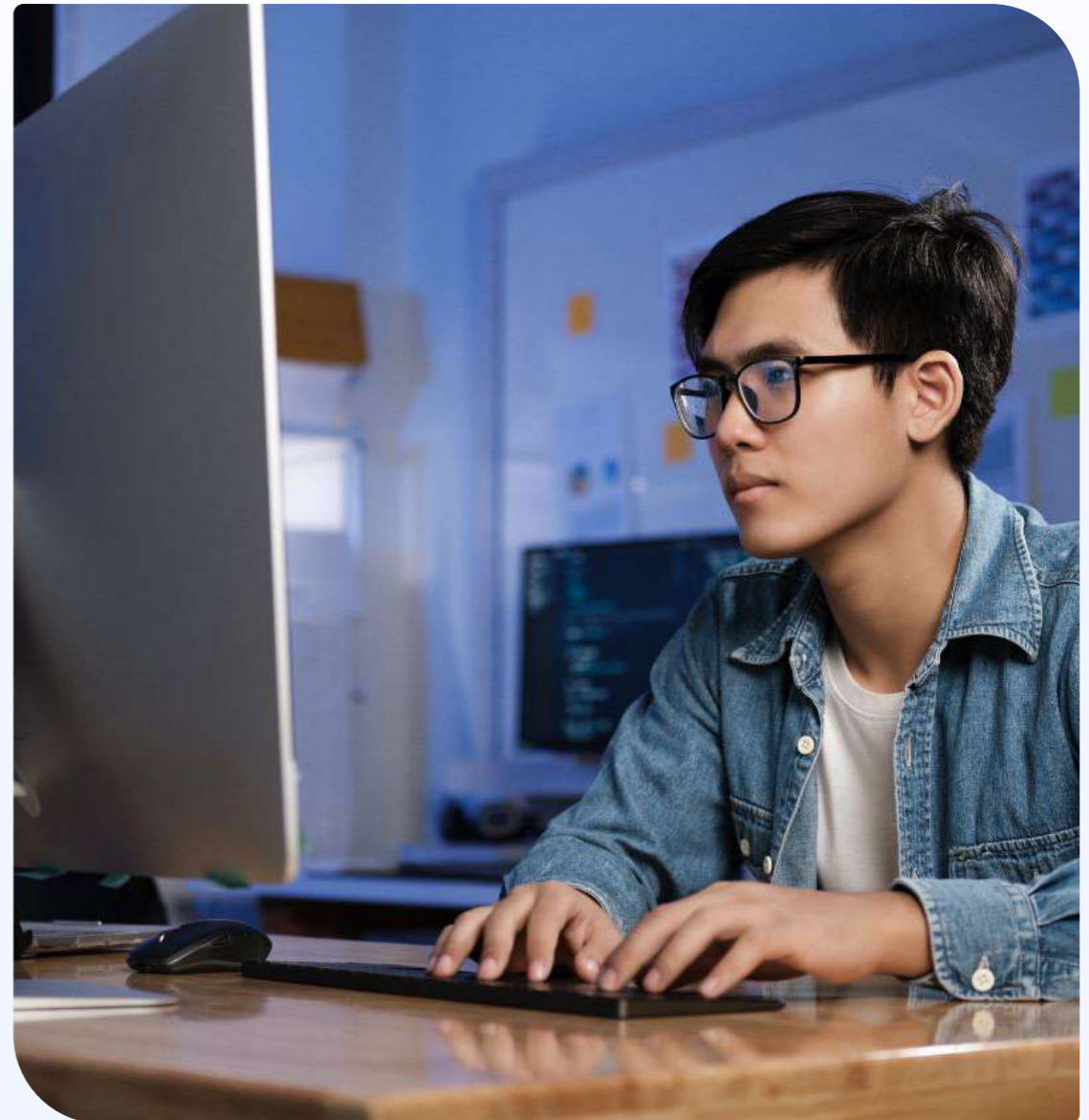
SKILLS

- SageMaker studio
- Lambda and step function workflow
- Cloud gateway

Introducing Generative AI with AWS

Overview

Introducing Generative AI with AWS, a beginner-level Udacity course, delves into generative AI, focusing on its fundamentals, historical context, and real-world applications. It covers AI and ML foundations, Large Language Models (LLMs) with transformer-based architectures, and the societal impacts of generative AI. The course aims to impart a deep understanding of AI's evolution, distinguish AI from ML, explore LLMs, and emphasize ethical AI deployment. It includes exercises on AI history, ML approaches, prompt engineering, and responsible AI use. Prerequisites are basic Python.

PREREQUISITES	DURATION	LEVEL	REQUIRED HARDWARE/SOFTWARE
Basic Python	4 Weeks	Beginner	Learners need access to a computer running OS X or Windows.

Lessons, Skills, and Project

1. Artificial Intelligence in Context

- Generative AI Fluency
- AI in Everyday Life
- AWS Cost Management
- Eliza Chatbot
- Amazon Alexa
- Amazon Sagemaker
- Amazon Rekognition

2. Fundamentals of AI and ML

- Learning Models
- ML Algorithms

3. Using Large Language Models (LLMs)

- Prompt Engineering
- Amazon Bedrock

4. Real-world Applications of Generative AI

- Bedrock Playgrounds
- Stable Diffusion XL

5. Project: Building a Domain Expert Model

Learner Success Stories

Oluwadolapo Obafemi

A determined woman whose journey into the world of AI & ML defies stereotypes and challenges gender norms. Oluwadolapo shares her experiences as she navigates through the complexities of AI, inspiring women worldwide to pursue their dreams regardless of societal expectations.

Read more

Betty Kamande

Betty embarked on a significant career switch, transitioning from 4 years in Finance/Procurement in Nairobi, Kenya to Data Science & Machine Learning driven by a curiosity for financial analysis. Enriched by experiences from two AWS AI & ML Scholarship programs, Betty mastered AI Programming with Python and AWS Machine Learning, leading to a successful transition and eventual employment as an Associate Data Scientist at Xetova Ltd. Her journey underscores the power of education, mentorship, and continuous learning, serving as inspiration for others navigating their paths of growth and discovery.

Read more

What students love about the scholarship

Convenient

Courses are part-time and online so learners can study when and where it's convenient for them.

Flexible

Our flexible schedule means they can put in just a few hours a week and learn at their own pace.

In-depth

Students can access dozens of hours of free training modules and tutorials on the latest AI and ML skills and their real-world applications.

Inclusive

The scholarship is available to high school or college students, over the age of 16 globally.

Cutting-edge

Students get the exciting opportunity to turn theory into action by training ML models to power a virtual race car using AWS DeepRacer Student League, a global autonomous racing competition exclusively for AWS AI & ML students.

Nanodegree-support

Students get technical support throughout the Nanodegree program from industry experts in machine learning. They also gain exposure to the latest innovations and trends in the field directly from ML leaders. Learners in this program receive access to an inclusive job board only for scholarship recipients.

Learn More at

WWW.UDACITY.COM