



Post Graduate Program in AI and Machine Learning

In collaboration with IBM

With 4 dedicated live sessions on latest AI topics like ChatGPT, Generative AI, Explainable AI and many more



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simplilearn

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About the Program

Artificial intelligence (AI) and machine learning are among the most sought after and highly compensated digital economy skills. Accelerate your career with our acclaimed Post Graduate Program in AI and Machine Learning in collaboration with Purdue University and in collaboration with IBM. This program features the perfect mix of theory, case studies, and extensive hands-on practice in artificial intelligence education, leveraging Purdue's academic excellence and Simplilearn's partnership with IBM. This program is a blend of self-paced online videos, live virtual classes, hands-on projects, and GPUenabled labs. Mentorship sessions will provide you with a high-engagement learning experience and real-world applications, helping you master essential AI and machine learning skills. You will receive in-depth exposure to AI concepts and workflows, Python, machine learning, deep learning concepts using TensorFlow and Keras, computer vision, GANs, parallel and distributed computing using GPUs, and more. You will also learn how to deploy deep learning models in various environments (such as Kubernetes and Docker), the basics of natural language processing (NLP), speech recognition, deep reinforcement learning, plus ChatGPT and its applications in different fields, which will prepare you for an exciting career in AI and machine learning.

Key Features of the Program



Program completion certificate from Purdue University and Simplilearn



Access to Purdue's alumni association membership on program completion



Core curriculum delivered in live classes by industry practitioners



Live interactive sessions on the latest AI trends, such as ChatGPT, generative AI, explainable AI, and more



Live-online masterclasses delivered by Purdue faculty and prominent industry experts



3 capstones and 25+ hands-on projects from various industry domains



Gain exposure to ChatGPT, OpenAI, Dall-E, Midjourney & other prominent tools



Simplilearn's career services help you get noticed by top hiring companies



Exclusive hackathons and Ask Me Anything sessions by IBM



Industry recognized IBM certificates for IBM courses

About the Post Graduate Program in AI And Machine Learning in collaboration with Purdue University

This Post Graduate Program in AI And Machine Learning is in collaboration with Purdue University, one of the world's leading research and teaching institutions with over 150 years of academic excellence, offering higher education at its highest proven value. Committed to student success, Purdue is changing the student experience with a greater focus on faculty-student interaction and creative use of technology.

This program is designed to prepare you to kickstart your career in Artificial Intelligence, Machine Learning, and Deep Learning.

Upon successfully completing this program, you will:

- › Receive a joint Simplilearn and Purdue certificate of completion
- › Eligible for Purdue Alumni Association Membership



About Simplilearn

Simplilearn is the world's #1 online bootcamp provider that enables learners through rigorous and highly specialized training. We focus on emerging technologies and processes that are transforming the digital world, at a fraction of the cost and time as traditional approaches. Over one million professionals and 2000 corporate training organizations have harnessed our award-winning programs to achieve their career and business goals.

Program Eligibility Criteria and Application Process

Those wishing to enroll in the Post Graduate Program in AI and Machine Learning in collaboration with Purdue University will be required to apply for admission to the program.

Eligibility Criteria

For admission to this Post Graduate Program in AI and Machine Learning, candidates should have:

- ✓ A bachelor's degree with an average of 50% or higher marks
- ✓ Basic understanding of programming concepts and mathematics
- ✓ Working Professionals with 2+ years of experience are preferred to apply for this program

Application Process

The application process consists of three simple steps. An offer of admission will be made to the selected candidates and accepted by the candidates upon payment of the admission fee.

STEP 1 SUBMIT AN APPLICATION

Complete the application and include a brief statement of purpose to tell our admissions counselors why you're interested and qualified for the Post Graduate Program in AI and Machine Learning.

STEP 2 APPLICATION REVIEW

After you submit your application, a panel of admissions counselors will review your application and statement of purpose to determine your qualifications and interest in the program.

STEP 3 ADMISSION

An offer of admission will be made to qualified candidates. You can accept this offer by paying the program fee.



Talk to an Admissions Counselor

We have a team of dedicated admissions counselors who are here to help guide you in the application process and related matters. They are available to:

- ✓ Address questions related to the application
- ✓ Assist with financial aid (if required)
- ✓ Help you better understand the program and answer your questions

Program Outcomes



Gain industry-relevant skills on the latest trending AI topics such as generative AI, GPT, explainable AI, and generative modeling



Learn about the applications of ChatGPT, OpenAI, Dall-E, Midjourney & other tools



Understand the meaning, purpose, scope, stages, applications, and effects of AI



Gain an in-depth understanding of data science processes, data wrangling, data exploration, data visualization, hypothesis building, and testing



Perform scientific and technical computing using the SciPy package and its sub-packages, such as Integrate, Optimize, Statistics, IO, and Weave



Gain expertise in mathematical computing using the NumPy and Scikit-Learn package



Master the concepts of supervised and unsupervised learning, recommendation engine, and time series modeling



Validate machine learning models and decode various accuracy metrics



Master advanced topics, such as Keras and TensorFlow, elements of a Keras model, Keras on GPU, and more



Build deep learning models on the cloud using AWS Sagemaker



Implement deep learning algorithms, understand neural networks, and traverse the layers of data abstraction which will empower you to understand data like never before



Learn deep learning techniques like object detection using computer vision



Explore tools, such as Keras, to build computer vision applications



Become familiar with generative-adversarial networks (GANs)



Perform distributed and parallel computing using high-performance GPUs



Deploy deep learning models with Flask/Django, Kubernetes, and serverless environments like Docker and SageMaker



Learn about natural language understanding and natural language generation



Understand the fundamentals of natural language processing (NLP) using the most popular library, Python's Natural Language Toolkit (NLTK)



Understand how to apply machine learning and deep learning with NLP



Understand the basics of speech recognition and do hands-on exercises



Perform text-to-speech conversion with automated speech recognition



Work on voice-assistance devices and build Alexa skills



Use Python and TensorFlow to understand reinforcement learning theory



Learn about ChatGPT and its applications in different fields



Learn how to solve reinforcement learning problems with a variety of strategies





Who Should Enroll in this Program?

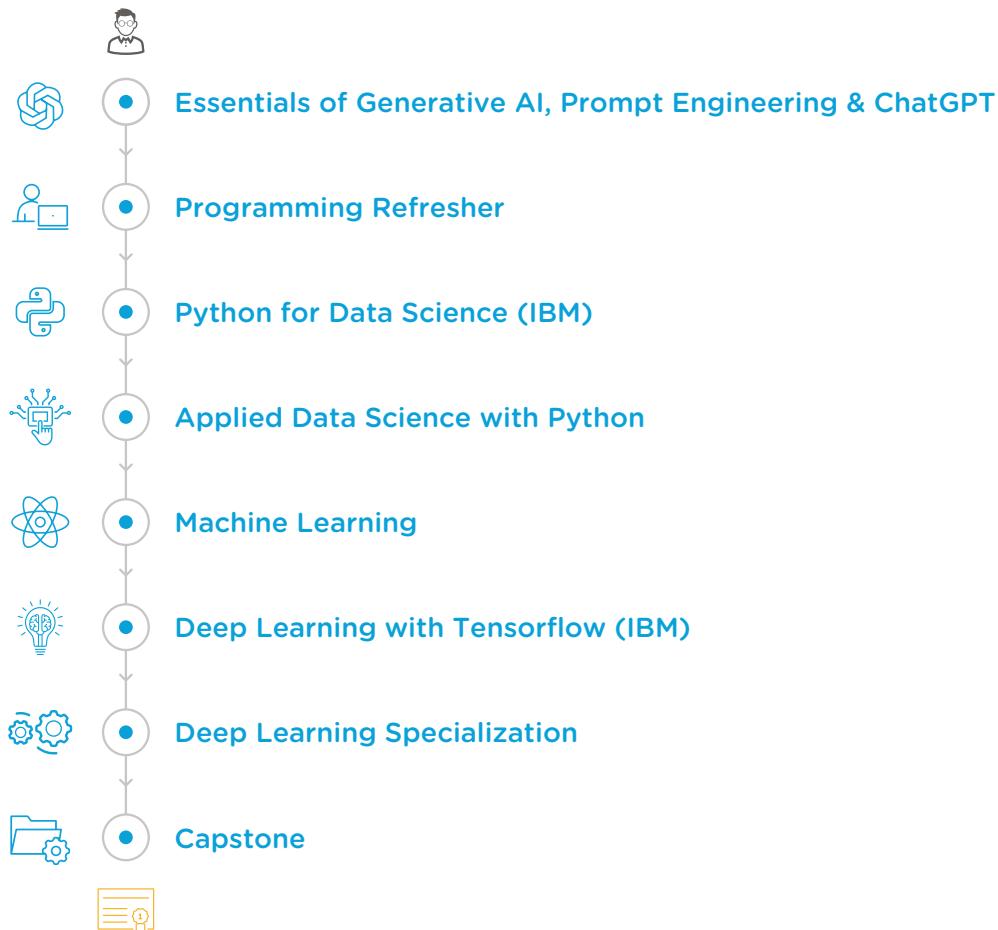
This program caters to working professionals from a variety of industries and backgrounds; the diversity of our students adds richness to class discussions and interactions.

The Artificial Intelligence Role requires a combination of experience, Data Science knowledge, and an understanding of the correct tools and technologies. AI is a solid career choice for both new and experienced professionals. Aspiring professionals looking for a career transition into AI and Machine Learning, who have basic programming skills and an analytical frame of mind, are most

suitably qualified to pursue this Post graduate Program in AI and Machine Learning, including:

- ✓ IT professionals
- ✓ Software developers
- ✓ Data analysts
- ✓ Analytics managers
- ✓ Business analysts
- ✓ Data engineers
- ✓ Data scientists
- ✓ Beginners or recent graduates with a bachelor's or master's degree

Learning Path



Electives

- > Advanced Deep Learning and Computer Vision
- > Natural Language Processing and Speech Recognition
- > Reinforcement Learning
- > Advanced Generative AI
- > Academic Masterclass
- > Industry Masterclass

Essentials of Generative AI, Prompt Engineering & ChatGPT

This course provides a comprehensive understanding of generative AI models focusing on ChatGPT. You will gain an understanding of the essentials of generative AI and its landscape, prompt engineering, explainable AI, conversational AI, ChatGPT and other LLMs.

Learning Outcomes

- ✓ Understand the fundamentals of artificial intelligence and generative AI models, including the working principles and various types of generative AI models
- ✓ Comprehend the concept of explainable AI, recognize its significance, and identify different approaches to achieve explainability in AI systems
- ✓ Apply effective prompt engineering techniques to improve the performance and control the behavior of generative AI models
- ✓ Gain an understanding of ChatGPT, including its working mechanisms, notable features, and limitations
- ✓ Identify and explore diverse applications and use cases where ChatGPT can be leveraged
- ✓ Gain exposure to fine-tuning techniques to customize and optimize ChatGPT models
- ✓ Recognize the ethical challenges of generative AI models and ChatGPT to ensure responsible data usage, mitigate bias, and prevent misuse

- ✓ Understand the potential of generative AI to revolutionize industries and examine prominent generative AI tools in depth
- ✓ Gain insights into the future of generative AI, its challenges, and the steps needed to unlock its full potential

Topics Covered

- ✓ Generative AI and its Landscape
- ✓ Explainable AI
- ✓ Conversational AI
- ✓ Prompt Engineering
- ✓ Designing and Generating Effective Prompts
- ✓ Large Language Models
- ✓ ChatGPT and its Applications
- ✓ Fine-tuning ChatGPT
- ✓ Ethical Considerations in Generative AI Models
- ✓ Responsible Data Usage and Privacy
- ✓ The Future of Generative AI
- ✓ AI Technologies for Innovation

Programming Refresher

Acquire essential Python skills that will serve as the building blocks for your entire program journey. Utilize Python to effectively implement artificial intelligence (AI) and machine learning (ML) algorithms, conduct data analysis, and efficiently construct intelligent systems.

Learning Outcomes

- ✓ Acquire knowledge of procedural and object-oriented programming
- ✓ Explore the advantages of using Python
- ✓ Install Python and its integrated development environment (IDE)
- ✓ Get experience with Jupyter Notebook and its usage
- ✓ Implement Python identifiers, indentation, and comments effectively
- ✓ Identify Python's data types, operators, and string functions
- ✓ Learn about the various types of loops in Python
- ✓ Explore the scope of variables within functions
- ✓ Explain the concepts of object-oriented programming (OOP) and its characteristics
- ✓ Describe methods, attributes, and access modifiers in Python
- ✓ Gain an understanding of multi-threading

Topics Covered

- ✓ Fundamentals of Programming
- ✓ Introduction to Python Programming
- ✓ Python Data Types and Operators
- ✓ Conditional Statements and Loops in Python
- ✓ Python Functions
- ✓ Object-Oriented Programming Concepts with Python
- ✓ Threading



Python for Data Science (IBM)

Designed by IBM, this course teaches students how to leverage Python for data science. Upon completion, you will be able to write Python scripts and conduct critical hands-on data analysis using a Jupyter-based lab environment.

Learning Outcomes

- ✓ Use variables, strings, functions, loops, and conditions to create your first Python program
- ✓ Gain an understanding of lists, sets, dictionaries, conditions, branching, objects, and classes
- ✓ Leverage pandas to load, manipulate, and save data, as well as read and write files in Python

Topics Covered

- ✓ Python Basics
- ✓ Python Data Structures
- ✓ Python Programming Fundamentals
- ✓ Working with Data in Python
- ✓ Working with NumPy Arrays

Applied Data Science with Python

This course provides a comprehensive overview of data science, covering key aspects such as data preparation, model building, and evaluation. You will develop a strong understanding of essential Python concepts like strings, Lambda functions, and lists. You will also delve into important libraries and tools such as NumPy for array manipulation, linear algebra for mathematical operations, and statistical concepts, including central tendency and dispersion measures, skewness, covariance, and correlation. Explore hypothesis testing techniques such as Z-test, T-test, and ANOVA. Gain proficiency in data manipulation using pandas and acquire data visualization skills using Matplotlib, Seaborn, Plotly, and Bokeh.

Learning Outcomes

- ✓ Understand the fundamentals of data science and its practical applications
- ✓ Explore the processes involved in data preparation, model building, and evaluation
- ✓ Apply Python strings, Lambda functions, and lists
- ✓ Understand the basics of NumPy and work with array indexing and slicing
- ✓ Comprehend linear algebra principles and their application in data analysis
- ✓ Calculate various statistical measures such as central tendency and dispersion
- ✓ Gain insight into statistical concepts like skewness, covariance, and correlation

- ✓ Describe the null hypothesis and alternative hypothesis in hypothesis testing
- ✓ Examine different hypothesis tests, including Z-test, T-test, and ANOVA
- ✓ Work with pandas' Series and DataFrame data structures for efficient data manipulation
- ✓ Utilize pandas to load, index, reindex, and merge data
- ✓ Prepare data through formatting, normalization, and standardization using techniques like data binning
- ✓ Construct visually appealing graphs using Matplotlib, Seaborn, Plotly, and Bokeh libraries

Topics Covered

- ✓ Introduction to Data Science
- ✓ Essentials of Python Programming
- ✓ NumPy
- ✓ Linear Algebra
- ✓ Statistics Fundamentals
- ✓ Probability Distributions
- ✓ Advanced Statistics
- ✓ Working with Pandas
- ✓ Data Analysis
- ✓ Data Wrangling
- ✓ Data Visualization
- ✓ End-to-End Statistics Applications in Python

Machine Learning

This course provides a comprehensive overview of various types of machine learning and their practical applications. You will explore the machine learning pipeline and gain a deep understanding of supervised learning, regression models, and classification algorithms. Additionally, the course covers unsupervised learning, clustering techniques, ensemble modeling, and evaluating machine learning frameworks such as TensorFlow and Keras. Lastly, you will have the opportunity to build a recommendation engine using PyTorch.

Learning Outcomes

- ✓ Examine the different types of machine learning approaches
- ✓ Analyze the machine learning pipeline and understand machine learning operations (MLOps)
- ✓ Comprehend supervised learning and its real-world applications
- ✓ Understand the concepts of overfitting and underfitting and learn how to detect and prevent them
- ✓ Analyze various regression models and their uses
- ✓ Identify linearity between variables and create correlation maps
- ✓ Learn different types of classification algorithms and understand their applications
- ✓ Master different types of unsupervised learning techniques
- ✓ Determine the appropriate use of unsupervised algorithms and explore different clustering methods
- ✓ Examine various ensemble modeling techniques, including bagging, boosting, and stacking

- ✓ Evaluate different machine learning frameworks like TensorFlow and Keras
- ✓ Build a recommendation engine using PyTorch

Topics Covered

- ✓ Machine Learning
- ✓ Supervised Learning
- ✓ Regression and its Applications
- ✓ Classification and its Applications
- ✓ Unsupervised Learning
- ✓ Ensemble Learning
- ✓ Recommendation Systems



Deep Learning with Tensorflow (IBM)

This course will take your machine learning skills to the next level by providing a comprehensive understanding of Deep Learning with TensorFlow and Keras. Become proficient in deep learning concepts, enabling you to construct artificial neural networks and navigate through layers of data abstraction. By unlocking the potential of data, this course prepares you for new frontiers in Artificial Intelligence.

Learning Outcomes

- ✓ Develop a deep understanding of neural networks and leverage them for deep learning
- ✓ Gain proficiency in TensorFlow and Keras, essential tools for deep learning
- ✓ Explore convolutional neural networks (CNNs) and their practical applications
- ✓ Become familiar with recurrent neural networks (RNNs) and autoencoders
- ✓ Optimize the performance of your neural networks using techniques like L2 regularization and dropout layers
- ✓ Create autoencoder models to detect anomalies

Topics Covered

- ✓ Introduction to AI and Deep Learning
- ✓ Artificial Neural Network
- ✓ Deep Neural Network and Tools
- ✓ Optimization, Tuning, and Interpretability of Deep Neural Networks
- ✓ Convolutional Neural Networks (CNN)
- ✓ Recurrent Neural Networks
- ✓ Autoencoders



Deep Learning Specialization

This comprehensive course provides you with the necessary expertise to deploy deep learning tools using AI/ML frameworks. You will explore the fundamental concepts and practical applications of deep learning while gaining a clear understanding of the distinction between deep learning and machine learning. The course covers various topics, including neural networks, forward and backward propagation, TensorFlow 2, Keras, performance improvement techniques, model interpretability, convolutional neural networks (CNNs), transfer learning, object detection, recurrent neural networks (RNNs), autoencoders, and creating neural networks in PyTorch. By the end of the course, you will have a solid foundation in deep learning principles and the ability to effectively build and optimize deep learning models using Keras and TensorFlow.

Learning Outcomes

- ✓ Differentiate between deep learning and machine learning and understand their respective applications
- ✓ Gain a comprehensive understanding of different types of neural networks
- ✓ Master the concepts of forward propagation and backward propagation in deep neural networks (DNN)
- ✓ Obtain an introduction to modeling and learn techniques for improving performance in deep learning models
- ✓ Comprehend hyperparameter tuning and model interpretability
- ✓ Learn about dropout and early stopping techniques and their implementation

- ✓ Gain expertise in convolutional neural networks (CNN) and object detection
- ✓ Grasp the fundamentals of recurrent neural networks (RNN)
- ✓ Understand the basics of PyTorch and learn how to create a neural network using PyTorch

Topics Covered

- ✓ Introduction to Deep Learning
- ✓ Artificial Neural Networks
- ✓ Deep Neural Networks
- ✓ TensorFlow
- ✓ Model Optimization and Performance Improvement
- ✓ Convolutional Neural Networks (CNN)
- ✓ Transfer Learning
- ✓ Object Detection
- ✓ Recurrent Neural Networks (RNN)
- ✓ Transformer Models for Natural Language Processing (NLP)
- ✓ Getting Started with Autoencoders
- ✓ PyTorch

Capstone Project

The capstone project allows you to implement the skills you will learn throughout this program. You will solve industry-specific challenges by leveraging various AI and ML techniques. The capstone project will help you showcase your expertise to employers.

Learning Outcomes

The capstone project will enhance your understanding of the Artificial Intelligence decision cycle, including performing exploratory data analysis, building and fine-tuning a model with cutting-edge AI-based algorithms, and representing results.



Electives

Advanced Deep Learning and Computer Vision

In this advanced course, you will dive deep into the field of computer vision and master advanced deep learning techniques. The course covers various topics, including image formation and processing, convolutional neural networks (CNNs), object detection, image segmentation, generative models, optical character recognition, distributed and parallel computing, explainable AI (XAI), and deploying deep learning models. By the end of this course, you will have the expertise to tackle complex computer vision challenges and effectively deploy deep learning models in real-world applications.

Natural Language Processing and Speech Recognition

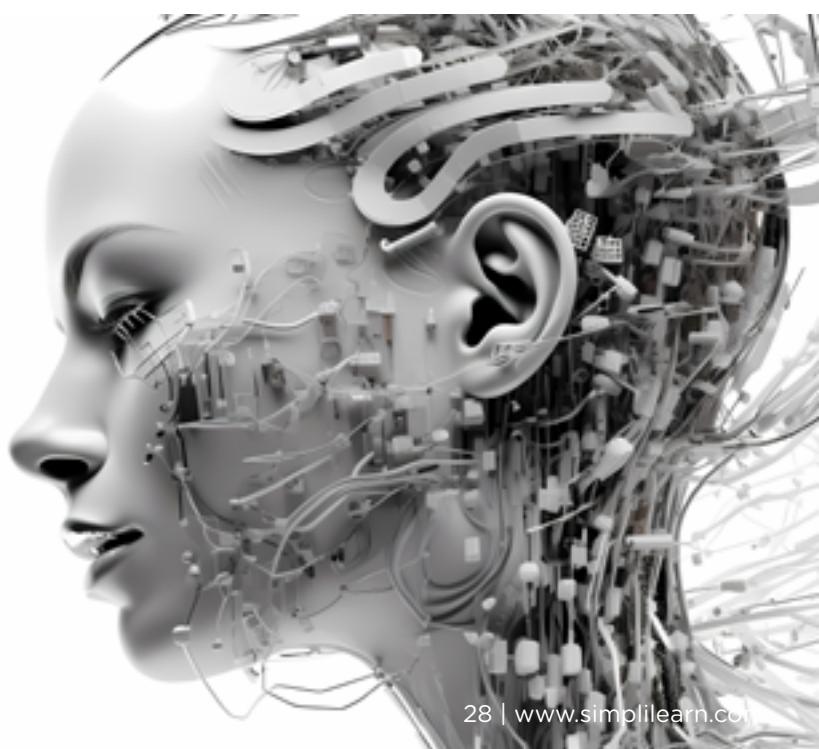
This comprehensive course explores the science behind applying machine learning algorithms to process large volumes of natural language data. With a primary focus on natural language understanding, feature engineering, natural language generation, automated speech recognition, speech-to-text conversion, text-to-speech conversion, and voice assistance devices (including building Alexa skills), you will acquire advanced skills in natural language processing and speech recognition. By the end of this course, you will be equipped to tackle sophisticated challenges in these areas and apply your knowledge to build cutting-edge language and speech-based applications.

Reinforcement Learning

This course is designed to guide you through the core concepts of reinforcement learning (RL) and provide you with the necessary skills to solve RL problems using Python and TensorFlow. You will learn various strategies and algorithms to tackle reinforcement learning problems and gain a solid understanding of RL theory. By the end of this course, you will be proficient in using reinforcement learning as a problem-solving strategy and be able to apply RL algorithms to address complex real-world challenges effectively.

Advanced Generative AI

Explore cutting-edge generative AI concepts in this advanced course. Dive deep into neural networks, LLMs, their structures, and various generative models, including VAEs, GANs, autoencoders, and transformer-based models. Additionally, investigate renowned gen AI models like GPT, BERT, and T5 and learn how to assess their performance. Through practical exercises, gain valuable experience creating and implementing a conversational chatbot capable of engaging in substantial dialogues.



Tools Covered



TensorFlow



Projects



Food Service

Using data science techniques, such as time series forecasting, to help a data analytics company forecast demand for different restaurant items.



Production

To understand their overall quality and sustainability, perform a feature analysis of water bottles using EDA and statistical techniques



BFSI

Uses deep learning to construct a model that predicts potential loan defaulters and ensures secure and trustworthy lending opportunities for a financial institution.



Tourism

Uses AI to categorize images of historical structures and conduct exploratory data analysis (EDA) to build a recommendation engine that improves marketing initiatives for historic locations.



Retail

Use exploratory data analysis and statistical techniques to understand the factors contributing to a retail firm's customer acquisition.



Ecommerce

Develop a shopping app for an ecommerce company using Python



Human Resources

Build a machine learning model that predicts employee attrition rate at a company by identifying patterns in their work habits and desires to stay with the company.



Automobile

Examine accident data involving Tesla's auto-pilot feature to assess the correlation between road safety and the use of autopilot technology.



Entertainment

Perform cluster analysis to create a recommended playlist of songs for users based on their user behavior.



Real Estate

Use feature engineering to identify the top factors that influence price negotiations in the homebuying process.



Healthcare

Use distributed training to construct a CNN model capable of detecting diabetic retinopathy and deploy it using TensorFlow Serving for an accurate diagnosis.

Leverage deep learning algorithms to develop a facial recognition feature that helps diagnose patients for genetic disorders and their variations.



Shipping

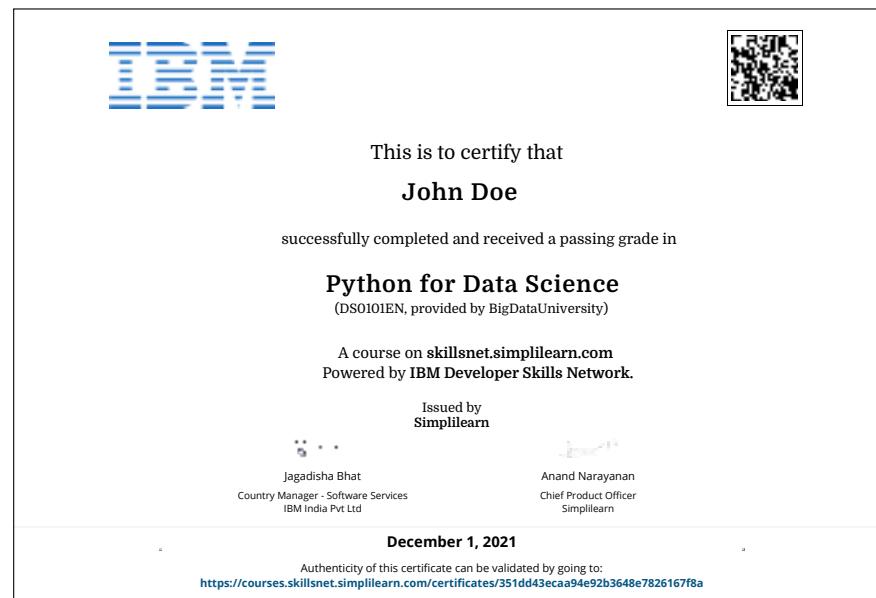
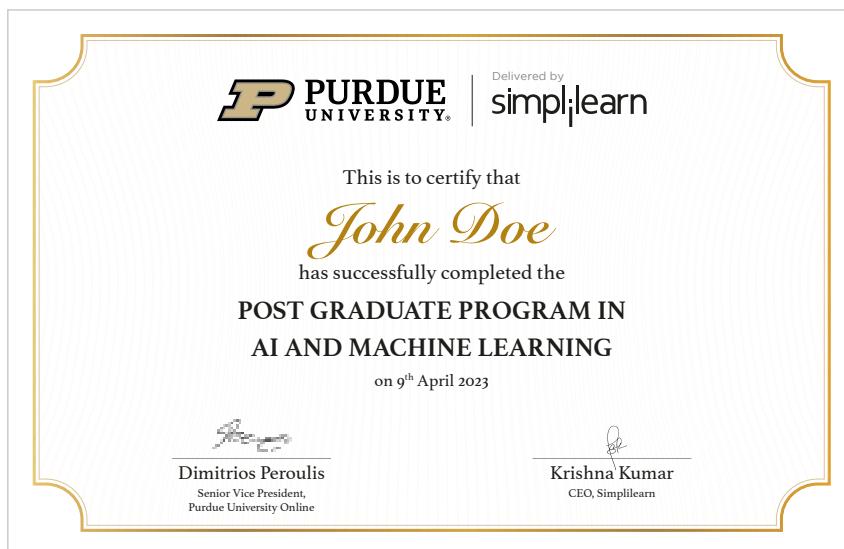
Use deep learning concepts, such as Convolutional Neural Networks (CNN), to automate a system that detects and prevents faulty situations resulting from human error and identifies the type of ship entering the port.

- ✓ Grasp the fundamentals of recurrent neural networks (RNN)
- ✓ Understand the basics of PyTorch and learn how to create a neural network using PyTorch

Topics Covered

- ✓ Introduction to Deep Learning
- ✓ Artificial Neural Networks
- ✓ Deep Neural Networks
- ✓ TensorFlow
- ✓ Model Optimization and Performance Improvement
- ✓ Convolutional Neural Networks (CNN)
- ✓ Transfer Learning
- ✓ Object Detection
- ✓ Recurrent Neural Networks (RNN)
- ✓ Transformer Models for Natural Language Processing (NLP)
- ✓ Getting Started with Autoencoders
- ✓ PyTorch

Certificates



Upon completion of this Post Graduate Program in AI and Machine Learning, you will receive a program completion certificate from Purdue University and Simplilearn. You will also receive IBM certificates for all IBM courses along with certificates from Simplilearn for the courses completed in the learning path. These certificates will testify your skills as an AI and machine learning expert.

Program Endorsers



Venkata N Inukollu, PhD

[Assistant Professor, Purdue University](#)

Venkata N Inukollu has a Ph.D. in Computer Science, from Texas Tech University (USA). He received his M.S(Tech). in Software Systems from BITS -Pilani, INDIA. Dr. Venkata N Inukollu has interests vested in the areas of Software Engineering, E-Learning/Education, Software Testing in AI/Machine Learning and has received multiple commendations for his research and teaching expertise.

Recently received a [Prestigious] grant: Global Initiative of Academic Networks (GIAN):” SoftwareSecurity” from Govt of India in collaboration with NIT, Andhra Pradesh& Purdue university, USA.



USA

Simplilearn Americas, Inc.
201 Spear Street, Suite 1100, San Francisco, CA 94105
United States
Phone No: +1-844-532-7688

INDIA

Simplilearn Solutions Pvt Ltd.
53/1 C, Manoj Arcade, 24th Main, HSR Layout
2nd Sector, HSR Layout
Bangalore - 560102
Call us at: 1800-212-7688