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Microsoft

Microsoft AI Engineer Program



*From AI Foundations to
Agentic AI Excellence*



*Leverage Microsoft's
Industry Excellence*



*Become an Industry
Ready AI Engineer*

Key Features of the Program



Completion Certificate: Earn a joint certificate from Microsoft and Simplilearn



Microsoft Learn Badge: Unlock official badges on the Microsoft Learn portal



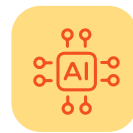
Beginner-Friendly Learning: Access a comprehensive curriculum with an optional module covering programming fundamentals



140+ Hours of Live Training: Learn from industry experts through interactive sessions



Hands-On AI Development: Work on 25+ projects and a capstone to showcase your skills



AI-900 Exam Preparation: Get in-depth training for the Microsoft Azure AI Fundamentals certification



Expert-Led Masterclasses: Learn directly from Microsoft experts via live online sessions



Industry-Leading Tools: Gain expertise in Azure OpenAI, Copilot, and PyTorch



AI & ML Specialization: Explore machine learning, deep learning, and prompt engineering



Career Support: Access Simplilearn's JobAssist for interview practice, resume and LinkedIn optimization, and more



Join the Booming AI Industry

Artificial Intelligence has witnessed rapid growth and widespread adoption across various industries in recent years. This technology has the potential to revolutionize how businesses operate, make decisions, and interact with their customers. The global artificial intelligence market is projected to grow at a CAGR of 36.6% from 2024 to 2030.



\$667.9 bn

Expected Generative AI market size by 2030

Source: Fortune Business Insights



24.4%

The global Generative AI market's projected CAGR from 2023-2030

Source: Statista



\$4.4 tn

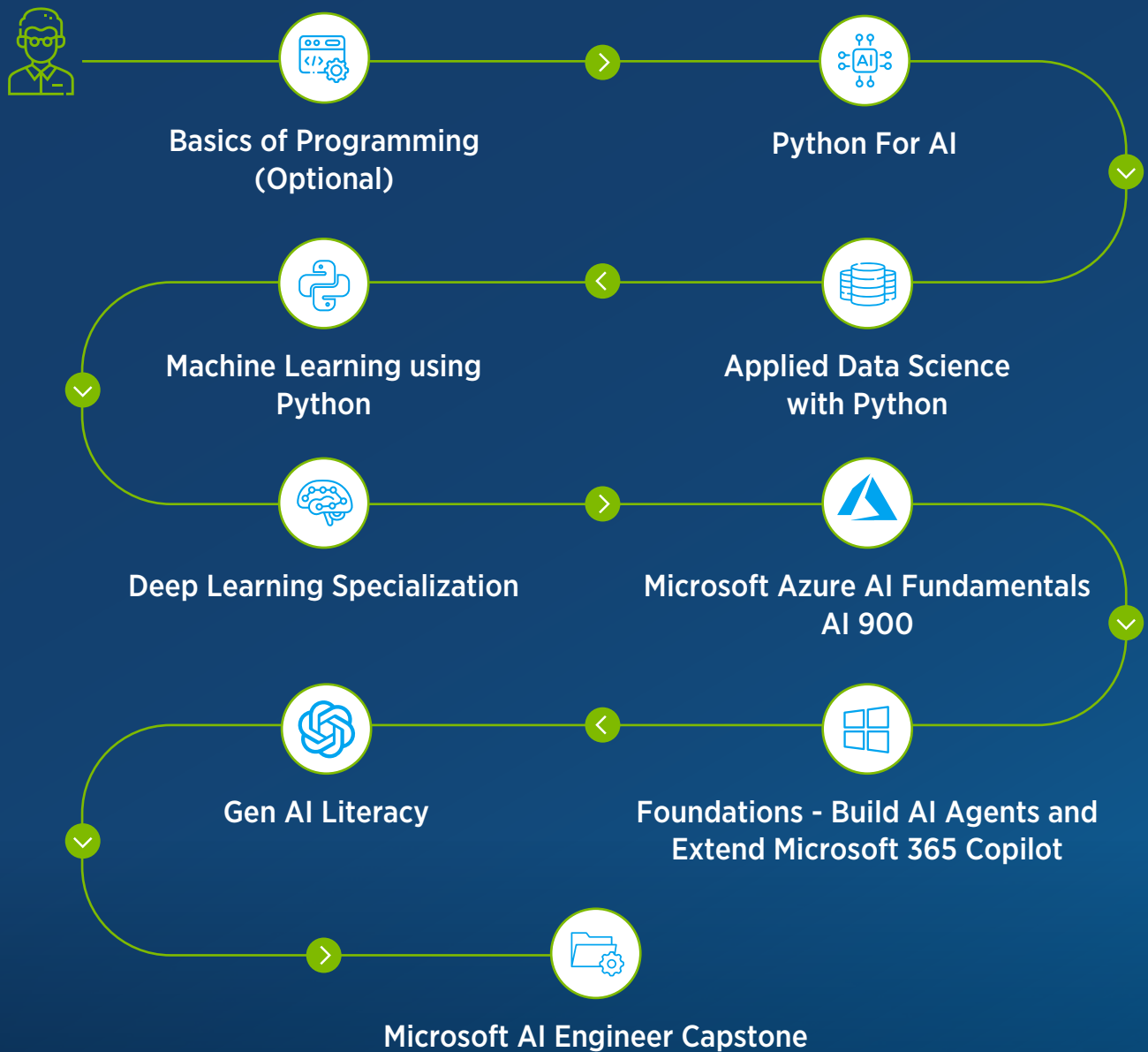
Expected value added by Generative AI to the global economy annually

Source: Mckinsey

Learning Outcomes

- ✔ Build a strong foundation in Python programming, covering data types, object-oriented programming, and efficient coding practices using Jupyter Notebook and Python IDE.
- ✔ Develop expertise in machine learning concepts, including model building, optimization, and hands-on projects to apply learning in practical scenarios.
- ✔ Prepare for the Microsoft Azure AI Fundamentals (AI-900) certification, gaining comprehensive knowledge of Azure AI services and cloud solutions for AI applications.
- ✔ Gain exposure to low-code frameworks like Copilot Studio and open-source tools such as AutoGen to design intelligent, autonomous AI workflows.
- ✔ Gain proficiency in natural language processing (NLP), exploring algorithms for text analysis and applications of NLP in the AI industry.
- ✔ Apply AI and machine learning techniques in a capstone project to solve real-world challenges, showcasing expertise to potential employers.
- ✔ Acquire critical skills in data science with Python, mastering tools and techniques for analyzing data and extracting real-world insights.
- ✔ Master deep learning techniques such as neural networks, forward/backward propagation, hyperparameter tuning, and model interpretability, with foundational knowledge in PyTorch.
- ✔ Learn to build and optimize Microsoft Copilot solutions using RAG-based architecture, prompt flow, and performance analysis techniques in Copilot Studio.
- ✔ Understand advanced generative AI concepts for cutting-edge AI applications, including transformers, attention mechanisms, and architectures like GPT and BERT.
- ✔ Attend industry masterclasses on Agentic AI using tools like Copilot Studio and AutoGen.

Learning Path Visualization



Electives:

- ✔ Natural Language Processing (NLP)
- ✔ Advanced Generative AI
- ✔ Masterclass on Agentic AI Solutions Using Copilot Studio and AutoGen

STEP 1

Basics of Programming (Optional)

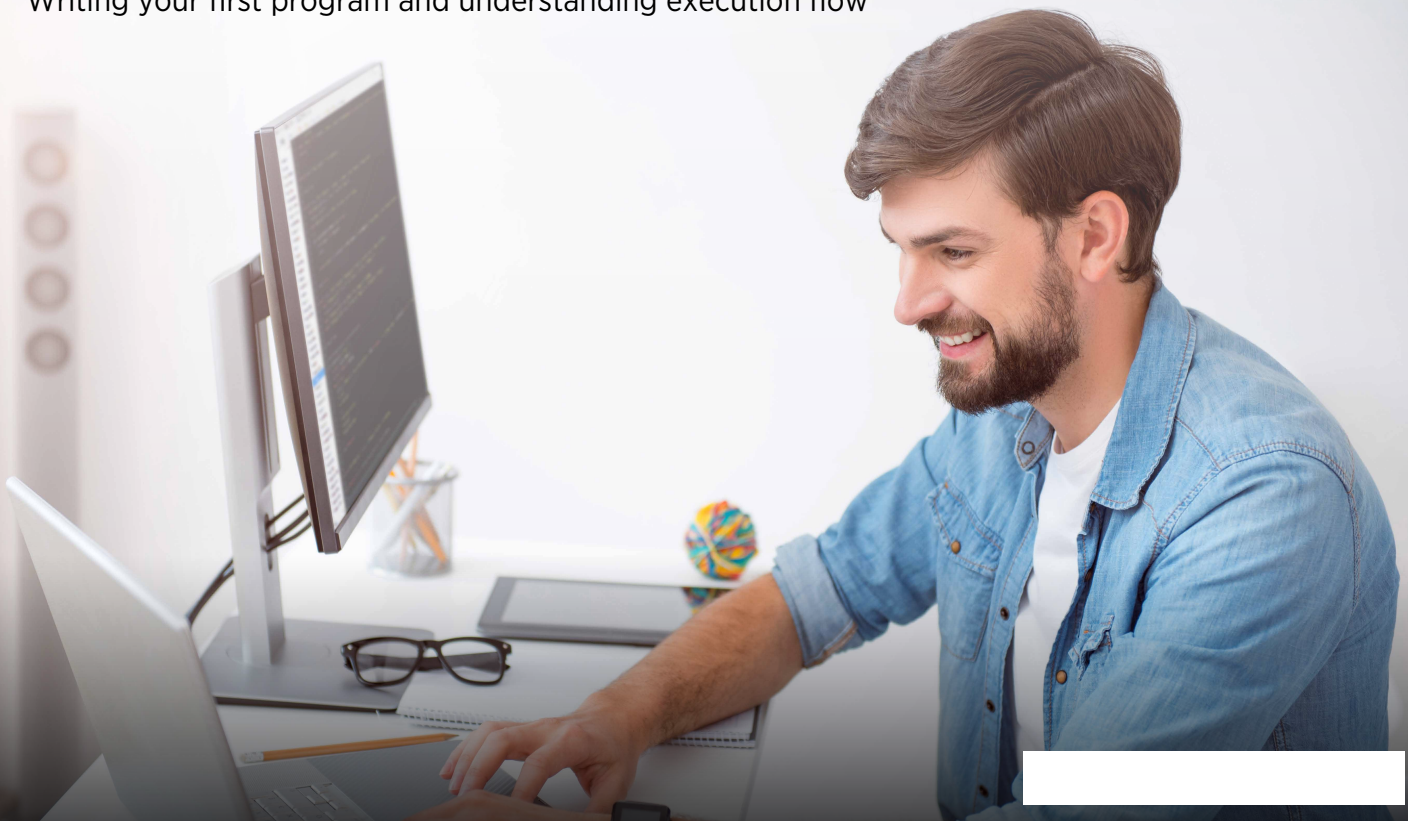
Build a solid foundation in how computers work and how programs come to life. Explore the fundamentals of digital logic and data representation to write and run a program. Understand programming concepts and prepare for more advanced technical skills through clear explanations and hands-on exercises.

Learning Outcomes

- ✓ Explain digital logic, binary systems, and core components of computing
- ✓ Describe how data is represented, encoded, and processed
- ✓ Differentiate between compilers and interpreters
- ✓ Write and execute basic programs using variables, loops, and conditions
- ✓ Understand how a code is executed inside the CPU

Topics Covered:

- ✓ Foundations of digital logic and computer systems
- ✓ Data representation and encoding (Binary, ASCII & Unicode)
- ✓ Introduction to programming concepts and history
- ✓ Compilers vs. interpreters and code execution
- ✓ Programming fundamentals covering variables, operators, conditions, and loops
- ✓ Writing your first program and understanding execution flow



Python For AI

This course equips you with essential Python programming skills that will serve as the building blocks for your entire program journey. You will learn to implement artificial intelligence (AI) algorithms, analyze data, and effectively build intelligent systems using Python.

Learning Outcomes

- ✓ Gain proficiency in Python programming, covering installation, syntax, and basic constructs
- ✓ Master Python data types, operators, conditional statements, and loops
- ✓ Develop skills in creating and using Python functions
- ✓ Understand and apply Object-Oriented Programming (OOP) concepts in Python
- ✓ Learn threading and multithreading concepts and their implementation in Python

Topics Covered:

- ✓ Introduction to Python Programming
- ✓ Python Data Types and Operators
- ✓ Conditional Statements and Loops
- ✓ Python Functions
- ✓ Python Programming Features
- ✓ Object-Oriented Programming with Python



Applied Data Science with Python

This course covers essential data science principles, including data preparation, model development, and evaluation. You'll learn key Python concepts like strings, Lambda functions, and lists, and dive into NumPy, linear algebra, and statistical concepts such as central tendency, dispersion, skewness, covariance, and correlation. Explore hypothesis testing methods like Z-tests, T-tests, and ANOVA. Additionally, master data manipulation with pandas and enhance your data visualization skills using Matplotlib, Seaborn, Plotly, and Bokeh.

Learning Outcomes

- ✓ Develop a comprehensive understanding of the data science process and its components
- ✓ Gain proficiency in using Python and its libraries for data science applications
- ✓ Master the use of NumPy and Pandas for data manipulation and analysis
- ✓ Construct visually appealing and informative graphs using Matplotlib, Seaborn, Plotly, and Bokeh
- ✓ Acquire skills in data wrangling and preprocessing techniques

Topics Covered:

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

Machine Learning using Python

Explore different types of machine learning and their applications, study the entire pipeline, and focus on supervised learning with regression models and classification algorithms. Learn unsupervised learning, clustering techniques, and ensemble modeling.

Learning Outcomes

- ✓ Examine various machine learning types and their characteristics
- ✓ Analyze the machine learning pipeline and understand MLOps (Machine Learning Operations)
- ✓ Explore supervised learning and its applications in real-world scenarios
- ✓ Understand overfitting and underfitting concepts, and learn detection and prevention methods
- ✓ Analyze different regression models and their practical applications
- ✓ Examine various ensemble modeling techniques such as bagging, boosting, and stacking

Topics Covered:

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

Deep Learning Specialization

This course delves into the fundamentals and applications of deep learning, highlighting its distinctions from machine learning. Key topics include neural networks, forward and backward propagation, Keras, performance optimization, model interpretability, convolutional neural networks (CNNs), transfer learning, object detection, RNNs, autoencoders, and PyTorch.

Learning Outcomes

- ✓ Understand the distinctions between deep learning and machine learning
- ✓ Learn about the practical applications of deep learning
- ✓ Master forward propagation and backward propagation in deep neural networks (DNN)
- ✓ Comprehend hyperparameter tuning and model interpretability in deep learning
- ✓ Implement dropout and early stopping techniques to improve model performance
- ✓ Gain expertise in CNNs for tasks like object detection

Topics Covered:

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

Microsoft Azure AI Fundamentals AI 900

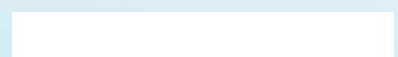
This module prepares you for the Microsoft Azure Fundamentals (AI-900) certification exam. You will learn the advantages, types, and fundamental building blocks of Azure cloud services, focusing on AI applications. The course also covers important aspects of managing costs, governance, and compliance within a cloud environment, preparing you to work confidently with Azure.

Learning Outcomes

- ✔ Understand the fundamental concepts and services of Azure Cloud
- ✔ Gain insights into managing costs and governance in Azure
- ✔ Prepare for the AI-900 certification with a thorough understanding of cloud and AI basics

Topics Covered:

- ✔ Azure cloud services overview
- ✔ Managing costs and enforcing governance
- ✔ Compliance and security in the Azure cloud



Foundations - Build AI Agents and Extend Microsoft 365 Copilot

Unlock the potential of Microsoft 365 Copilot by learning how to design, build, and extend AI agents that solve real business challenges. Get hands-on experience with the Copilot architecture, extensibility tools, and both low-code and pro-code approaches to create intelligent, task-driven solutions.

Learning Outcomes

- ✓ Explore the fundamentals of AI agents and Microsoft 365 Copilot architecture
- ✓ Identify and use the tools available to extend Copilot functionality
- ✓ Compare low-code and pro-code approaches for building AI agents
- ✓ Build and extend Copilot with connectors, Copilot Studio, and Azure AI Foundry
- ✓ Evaluate scenarios for selecting the right extensibility method

Topics Covered:

- ✓ Introduction to AI agents and Copilot extensibility
- ✓ Microsoft 365 Copilot architecture and core concepts
- ✓ Overview of extensibility tools like connectors, Copilot Studio, Azure AI Foundry, SDKs, and Agent Toolkit
- ✓ Low-code vs. pro-code development approaches
- ✓ Designing and building custom AI agents for business scenarios



STEP 8

Generative AI Literacy

Build a strong foundation in Generative AI and Machine Learning (ML) by exploring core concepts, key algorithms, and hands-on applications. Gain insights into deep learning, large language models, and AI-powered tools to develop practical expertise in implementing AI solutions.

Learning Outcomes

- ✓ Differentiate between deep learning, machine learning, AI & generative AI
- ✓ Learn the key differences and use cases of supervised, unsupervised, and reinforcement learning
- ✓ Explore generative AI algorithms such as neural networks, GANs, and transformers
- ✓ Understand how LLMs (Large Language Models) power chatbots
- ✓ Explore AI models such as ChatGPT, Gemini i, Claude, and Falcon
- ✓ Learn about image generation techniques using GANs, diffusion models, and VAEs
- ✓ Experiment with AI-driven image creation tools like DALL·E 2, Stable Diffusion, and MidJourney
- ✓ Gain practical experience with video generation tools like Runway ML, Synthesia, and Gen-2 by Runway
- ✓ Discover open-source AI repositories like Hugging Face and their impact
- ✓ Learn how marketplaces help keep track of emerging AI tools and explore prompt marketplaces like PromptBase
- ✓ Develop a solid understanding of prompt engineering for chatbots and AI search
- ✓ Experiment with OpenAI Playground settings such as temperature and sampling techniques

Topics Covered:

- ✓ Machine Learning & Generative AI Basics
- ✓ Types of Machine Learning: Supervised, Unsupervised, and Reinforcement Learning
- ✓ Generative AI Algorithms: Neural Networks, GANs, Transformers (GPT & Others)
- ✓ Large Language Models (LLMs) and Chatbots (ChatGPT, Gemini, Claude, Falcon, etc.)
- ✓ Image Generation: GANs, Diffusion Models, VAEs & Hands-on Tools (DALL·E 2, Stable Diffusion, MidJourney)
- ✓ Video Generation: Architectures (GANs, Diffusion Models, Transformers) & Hands-on Tools (Runway ML, Synthesia, Gen-2 by Runway)
- ✓ Open-Source AI Model Landscape: Hugging Face & AI Marketplaces
- ✓ Prompt Engineering: Chatbot

STEP 9

AI Engineer Capstone

The capstone project is the culmination of all the skills and knowledge you've acquired throughout this program. You will apply AI and machine learning techniques to solve industry-specific challenges. This hands-on project is designed to showcase your expertise in real-world scenarios, giving you a valuable portfolio piece to present to potential employers.

Learning Outcomes

- ✔ Apply AI and ML techniques to real-world industry challenges.
- ✔ Gain hands-on experience in building AI-driven solutions.
- ✔ Showcase your expertise through a capstone project.

Topics Covered:

- ✔ Industry-specific AI problem-solving.
- ✔ End-to-end implementation of AI and ML models.
- ✔ Project presentation and portfolio development.



Elective Courses:

Natural Language Processing (NLP)

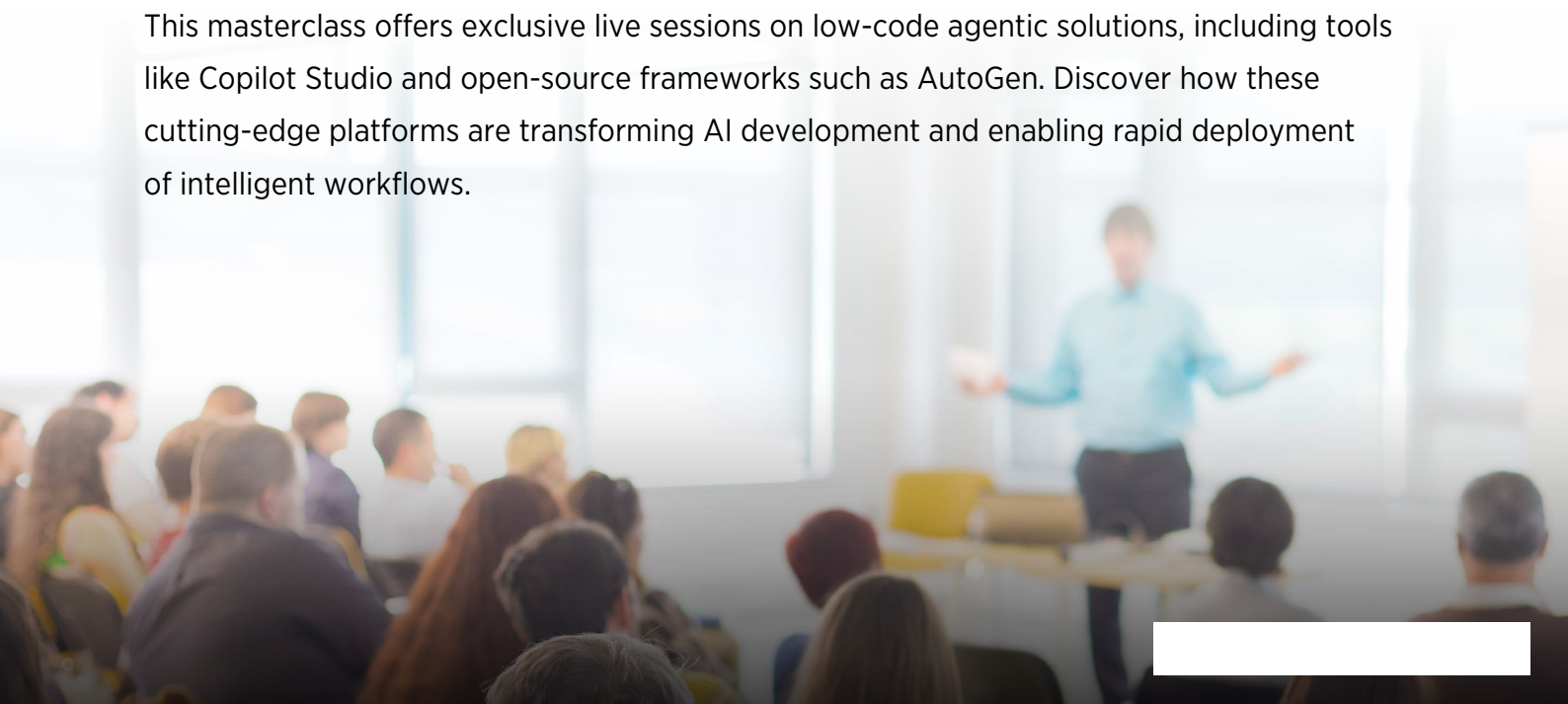
This advanced course comprehensively explores applying machine learning algorithms to process vast amounts of natural language data. It focuses primarily on natural language understanding, feature engineering, natural language generation, automated speech recognition, speech-to-text conversion, text-to-speech conversion, voice assistance devices, and building Alexa skills. By the end of the course, you will have a deep understanding of the science behind natural language processing and speech recognition, enabling you to develop advanced applications in these domains.

Advanced Generative AI

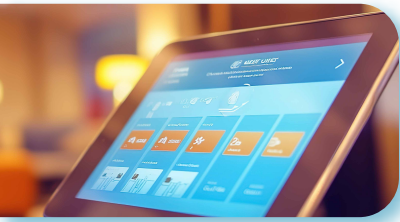
This Generative AI course offers a detailed exploration of AI's innovative capabilities, focusing on generative models such as Variational Autoencoders (VAEs), Generative Adversarial Networks (GANs), large language models (LLMs), and Transformer architectures. Participants will delve into attention mechanisms, LangChain Workflow Design, and advanced prompt engineering. The course equips professionals to develop and refine applications using cutting-edge LLMs, focusing on architecture, design principles, and practical applications in generative AI.

Master Class on Agentic AI Solutions Using Copilot Studio and AutoGen

This masterclass offers exclusive live sessions on low-code agentic solutions, including tools like Copilot Studio and open-source frameworks such as AutoGen. Discover how these cutting-edge platforms are transforming AI development and enabling rapid deployment of intelligent workflows.



Industry Projects



Project 1: MLB Digital Platform Enhancement

Build backend modules for MLB's platform to manage stats, schedules, and bookings; add multi-threaded reporting to improve load times and user experience.



Project 2: EdTech Backend System

Create backend modules for SL Tech's platform, manage learner credentials and courses, enhance user experience, and support interface upgrades.



Project 3: Sales Strategy Analysis

Analyze sales data by state, identifying top revenue states and guiding sales programs for weaker regions to support expansion decisions.



Project 4: Marketing Strategies with EDA

Conduct EDA and hypothesis testing to explore customer acquisition factors, enhancing marketing strategies based on behavior and product performance.



Project 5: Predicting Employee Iteration

Build an ML model for Portobello Tech to predict attrition, analyzing work habits, tenure, and satisfaction levels to inform employee retention strategies.



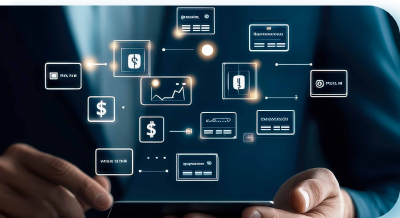
Project 6: Song Classification with Cluster Analysis

Use cluster analysis to create personalized playlists based on user behavior, improving song recommendations and enhancing customer engagement.



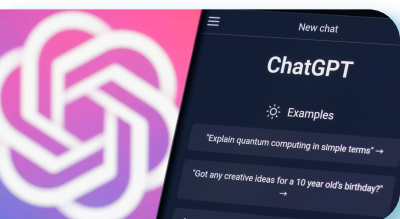
Project 7: Home Loan Data Analysis

Develop a deep learning model to predict loan defaults with imbalanced data, using historical data for a more secure lending process.



Project 8: Lending Club Loan Data Analysis

Create a deep learning model for Lending Club to predict loan defaults using 2007-2015 data, tackling imbalanced data challenges for risk assessment.



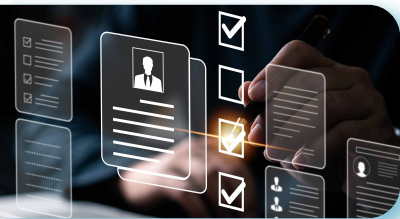
Project 9: ChatGPT-Based Storytelling

Design interactive storytelling with ChatGPT, enabling collaborative narrative building without coding, and enhancing creative writing skills.



Project 10: Virtual Project Management Consultant

Develop prompts enabling ChatGPT to provide project management advice, focusing on planning, risk management and team collaboration guidance.



Project 11: AI-Powered HR Assistant for Nestlé

Build an HR assistant using OpenAI GPT and Gradio to answer policy-related questions by extracting data from PDFs for efficient HR support.



Project 12: Creating Designs with OpenAI and Gradio UI

Create a platform using DALL-E and Gradio UI that transforms text prompts into designs, showcasing AI's role in digital marketing creativity.



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