

# Machine Learning with Python

## 1. Introduction to AI & Machine Learning

- Understand what AI and Machine Learning are and why they're critical for modern business
- Exploring definitions and types of AI
- Discussing AI in the Modern Age and its role in business
- Embrace Change: Learn and Build Confidence using the Tools – Don't be Replaced By Them

## 2. Deeper Dive into Machine Learning

- Basics of how mathematics are used in or apply to AI
- Algorithms: What are they and how are they used in AI and ML
- Supervised vs Unsupervised
- Classification, Regression, Clustering, Dimensionality Reduction, and Ensemble Methods
- The role of Machine Learning in AI and business decision-making
- Review a real business scenario where Machine Learning was used to increase efficiency.

## 3. Leveraging AI in Business & Decision Making

- Discussing key business areas where AI adds value: Operations, Marketing, Sales, HR, content development, coding and software development
- Explore how AI is used in business decision-making
- Introduction to predictive analytics
- Using AI for strategic decision-making

## 4. Hot Trends for AI in Business: Large Language Models (LLM), Generative AI and GPT

- Understand the basics of Generative AI and how it differs from other AI techniques
- Introduction to GPT and its applications in various sectors
- Explore how GPT uses machine learning to generate human-like text based on the input it receives.

- Understand the concept of language models and how they are trained using large amounts of text data

## **5. Basics of Neural Networks**

- What are they and how are they used?
- Basic parts: Neurons, activation functions, interactions.
- Types: Feedforward, recurrent, convolutional neural networks overview.
- How they learn: Forward propagation, backpropagation explained.
- Training Neural Networks: Importance of data preprocessing in training.
- Deep Neural Networks: Advantages and practical applications overview.
- In Action: Image recognition, language processing, etc. use cases.
- Ethical Considerations: Addressing biases and ethical concerns in neural networks.

## **6. Natural Language Processing (NLP) & Sentiment Analysis**

- What is NLP and how is it used?
- NLP Language and Semantic Meaning, Bigrams, Trigrams, n-Grams, Root Stemming and Branching
- Introduction to Sentiment Analysis: Sentiment indicators, Sentiment Sampling, Predicting Elections based on Sentiment Analysis

## **7. Using AI for Image, Video, and Audio Processing**

- Learn about Image processing and Identification, Facial Analysis, Audio Processing
- Discuss the role of AI in analyzing streaming video and real-world AV processing

## **8. AI for Business Technical Tools: Data Science, Deep Learning & The Cloud**

- Applying AI in Data Science overview
- Tools: Python, NumPy, Pandas, SciKitLearn, Hadoop, Spark
- NoSQL Databases
- Deep Learning overview
- AI for Business in the Cloud overview

## **9. Practical Applications and the Future of AI in Business**

- What's next in applied AI for businesses
- New AI trends shaping the future of business
- Ethical considerations when implementing AI

#### **Next-Steps**

- Hands-on Practice
- Resources
- AI & ML Communities