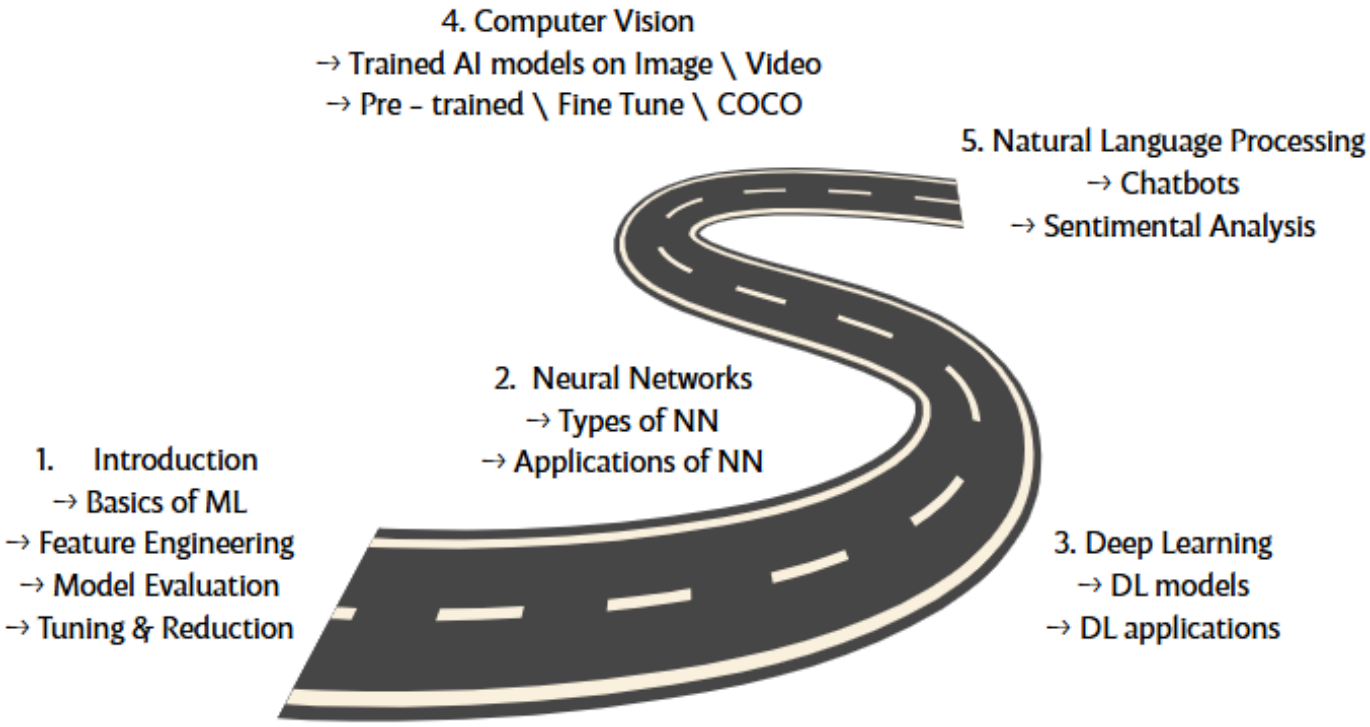
Aibytec

Empowering the Future

Machine Learning & Deep Learning Course roadmap



Course duration = 3 month (3 classes a week)

Fee = 12,000 pkr /month

Machine learning:

1. Introduction of different type of learnings:

i. Supervised Learning: Understanding the concepts of supervised learning, where the algorithm learns from labeled training data to make predictions or classifications.

ii. Unsupervised Learning: Exploring unsupervised learning techniques, where the algorithm learns from unlabeled data to find patterns, clusters, or hidden structures.
iii. Semi-Supervised Learning: Studying the techniques that combine both labeled and unlabeled data for training models.
iv. Reinforcement Learning: Learning about the process of training agents to make decisions in an environment to maximize rewards.

2. Feature Engineering:

Learning how to select, transform, and create relevant features to improve model performance.

3. Model Evaluation and Validation:

Understanding techniques to evaluate and validate machine learning models to ensure their effectiveness and generalization. 7. Bias-Variance Trade off: Learning about the tradeoff between bias and variance in machine learning models and how it affects performance.

4. Hyper-parameter Tuning:

Exploring techniques to optimize hyperparameters of machine learning models for improved performance.

5. Dimensionality Reduction:

Studying techniques to reduce the number of features in high-dimensional datasets while preserving essential information.

6. Transfer Learning:

Learning about leveraging per-trained models for new tasks to improve efficiency and performance.

7. Time Series Analysis:

Exploring techniques for analyzing and forecasting time-series data using machine learning models.

8. Ethics in Machine Learning:

Considering the ethical implications of using machine learning and ensuring fairness and transparency in model predictions.

9. Neural Network Architectures:

Studying different types of neural network architectures, including convolutional neural networks (CNNs) and recurrent neural networks (RNNs). Deep Learning: study neural networks, back-propagation, activation functions, and optimization algorithms to develop advanced models for complex pattern recognition and data analysis.

10. Deep Learning:

- **Neural Networks** – Learn about layers, types (CNN, RNN), and how they work.
- **Backpropagation** – How networks learn from errors and improve.
- **Activation Functions** – Sigmoid, ReLU, Softmax, and why they matter.
- **Optimization** – Gradient Descent, Adam, and tuning for better results.

11. Computer Vision:

Learning about machine learning techniques for image and video analysis. (gan models)

12. Natural Language Processing (NLP):

Studying techniques for understanding and processing human language using machine learning. (Huggingface)