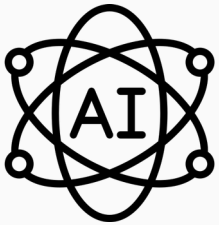


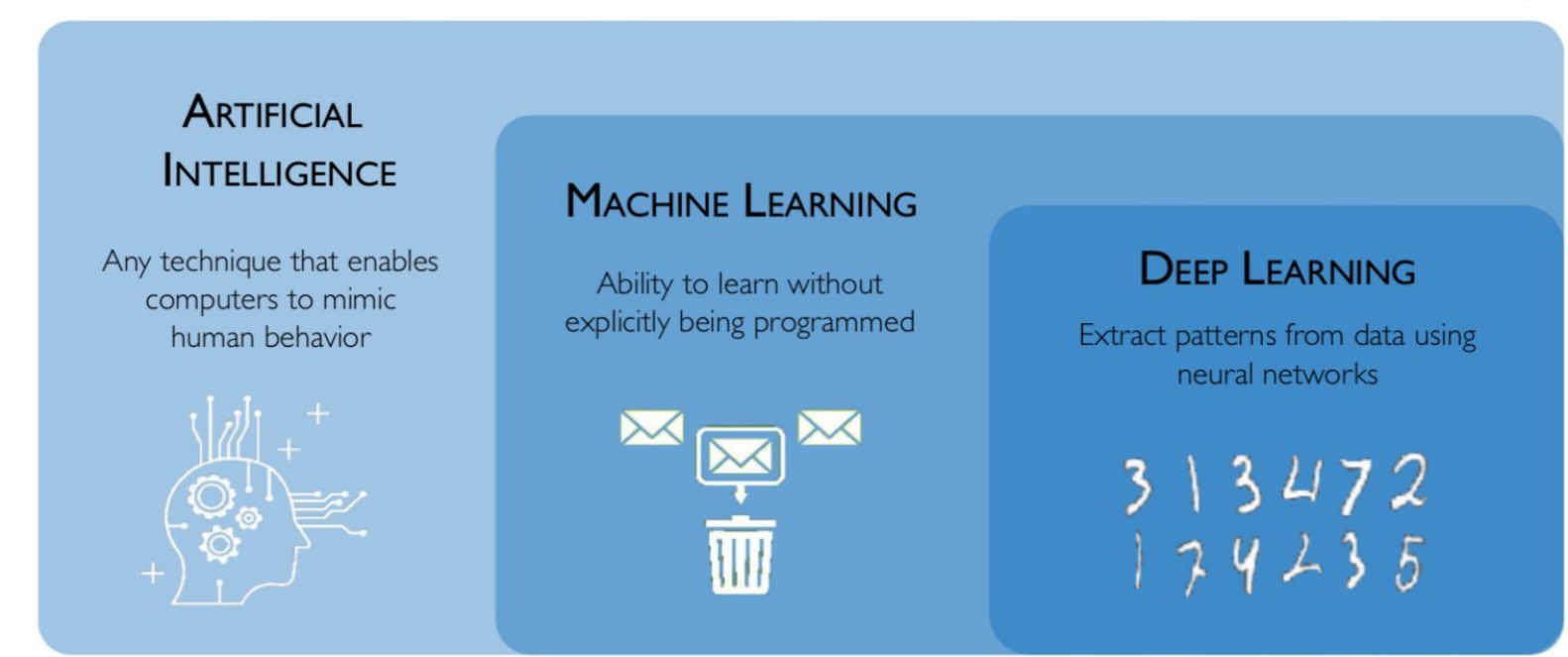
4 Days Workshop on

Artificial Intellegence

Deep Learning

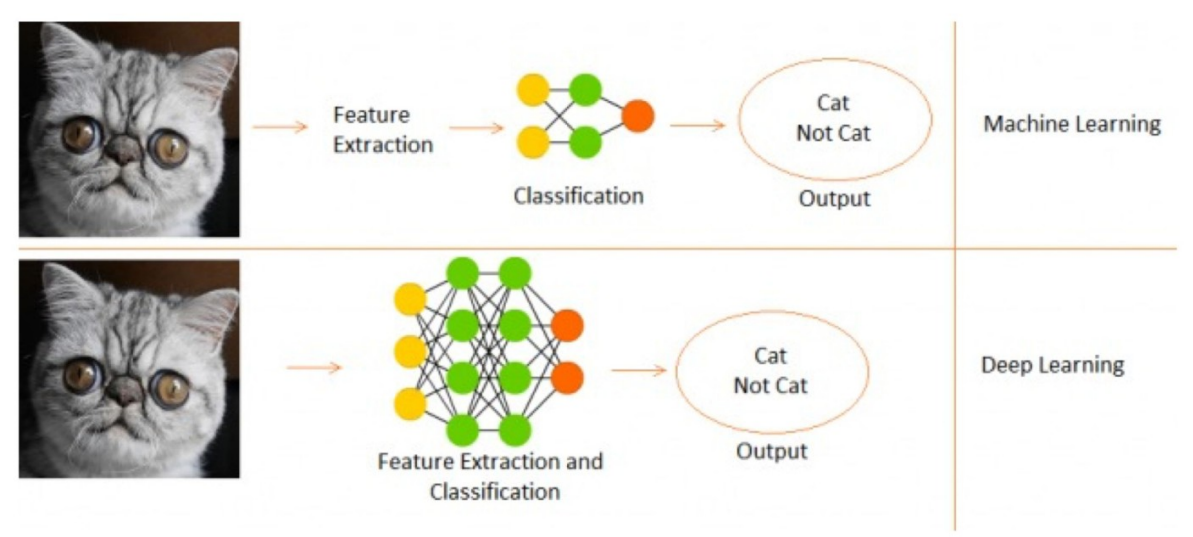
Basics of Neural Networks, RNN and Transformers

What is Deep Learning ?



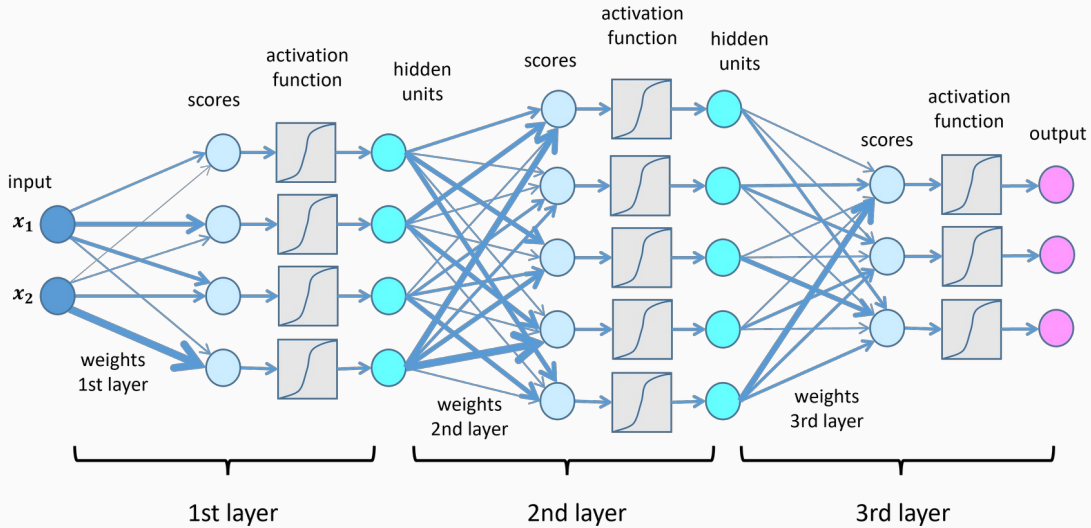
Why Deep Learning ?

- Hand engineered features are time consuming, brittle, and not scalable in practice

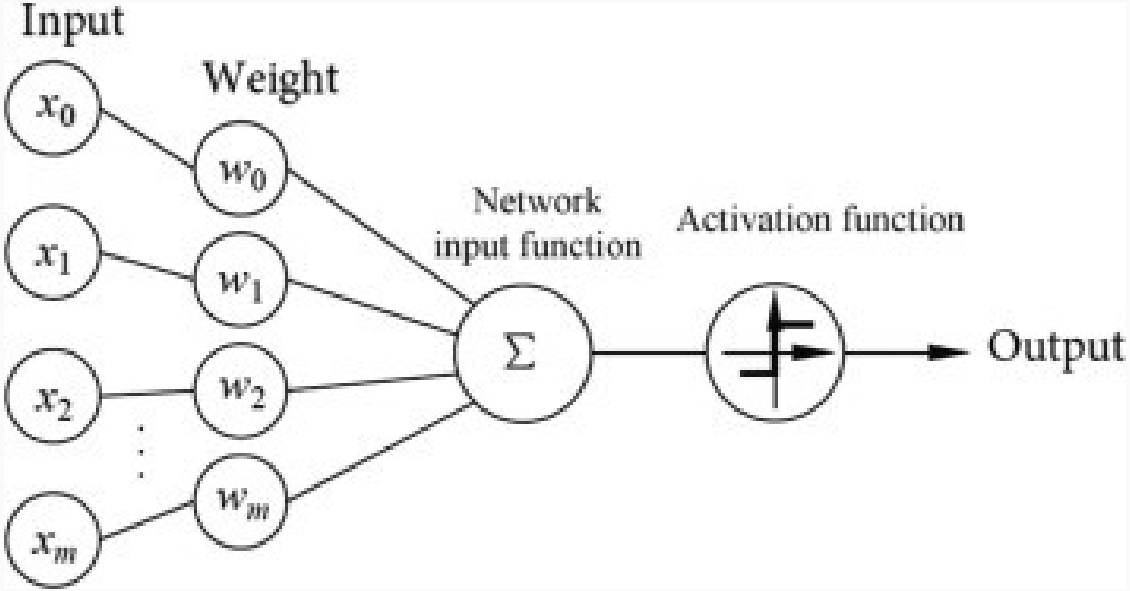


What is Neural Network ?

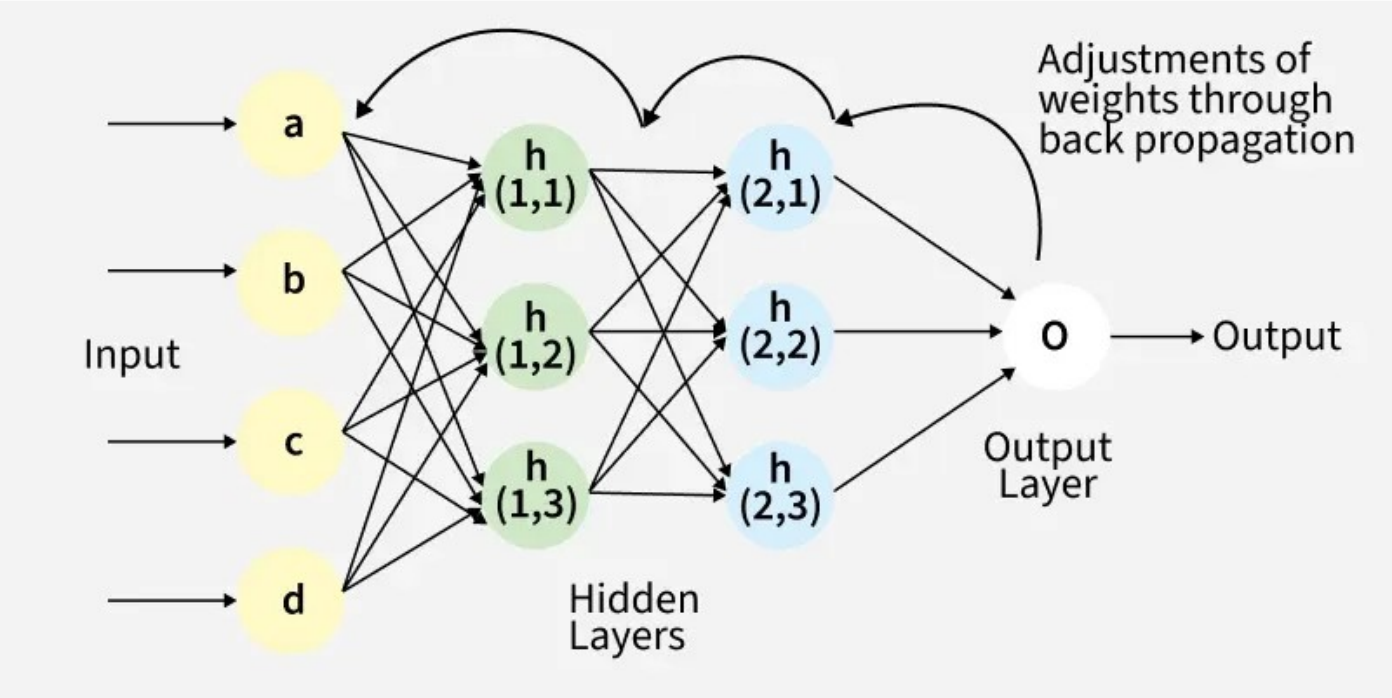
- A neural network is a model that learns patterns from data
- It has layers of "neurons" connected by adjustable weights
- Learns by adjusting these weights from examples



Perceptron: Forward Propagation



Backpropagation

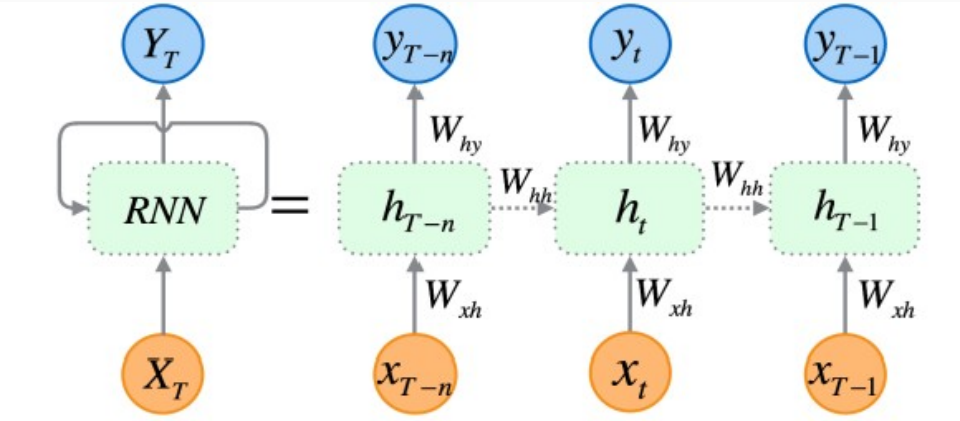


Limitation of basic NN

- They expect fixed-size input
- They don’t understand order or context in sentences

What is RNN ?

- Designed to handle sequential data like text
- Remembers previous words while processing the next one
- Good for short sequences like simple sentences

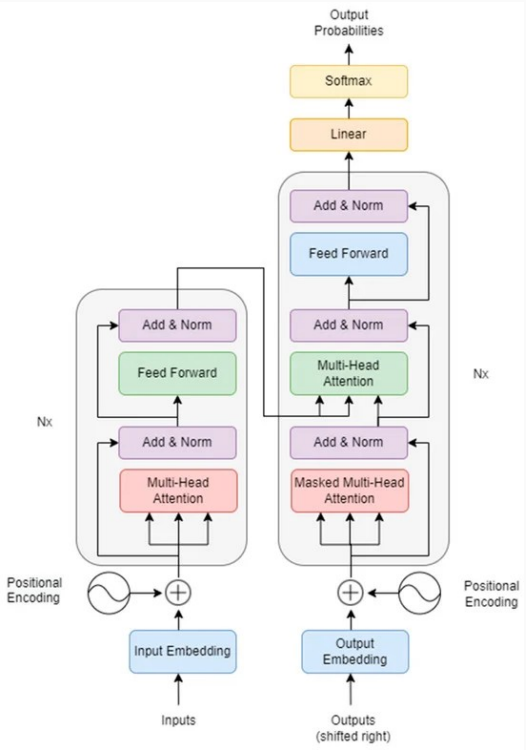


Limitation of RNN

- Hard to remember long-term context
- Slow training and prone to forgetting
- Struggles with long or complex sentences

What is Transformer ?

- Looks at the entire sentence at once
- Uses attention to focus on important words
- Fast, scalable, and works well with long texts



Why Transformers Made NLP So Powerful

- Understands meaning in context
- Learns relationships between all words, not just neighbors
- Powers models like BERT and GPT