

Day-19

28-6-2024

Revision of previous topics:

CNN

RNN

CNN: Convolution Neural Network a type of artificial neural network used primarily for image recognition and processing, due to its ability to recognize patterns in images.

Key components of a Convolutional Neural Network include:

1. **Convolutional Layers:** These layers apply convolutional operations to input images, using filters (also known as kernels) to detect features such as edges, textures, and more complex patterns. Convolutional operations help preserve the spatial relationships between pixels.
2. **Pooling Layers:** Pooling layers downsample the spatial dimensions of the input, reducing the computational complexity and the number of parameters in the network. Max pooling is a common pooling operation, selecting the maximum value from a group of neighboring pixels.
3. **Activation Functions:** Non-linear activation functions, such as Rectified Linear Unit (ReLU), introduce non-linearity to the model, allowing it to learn more complex relationships in the data.
4. **Fully Connected Layers:** These layers are responsible for making predictions based on the high-level features learned by the previous layers. They connect every neuron in one layer to every neuron in the next layer

RNN

Recurrent Neural Network(RNN) is a type of Neural Network where the output from the previous step is fed as input to the current step

Types Of RNN:

There are four types of RNNs based on the number of inputs and outputs in the network.

One to One

One to Many

Many to One

Many to Many

One to One:

This type of RNN behaves the same as any simple Neural network it is also known as Vanilla Neural Network. In this Neural network, there is only one input and one output

One to Many:

In this type of RNN, there is one input and many outputs associated with it. One of the most used examples of this network is Image captioning where given an image we predict a sentence having Multiple words.

Many to One:

In this type of network, Many inputs are fed to the network at several states of the network generating only one output.

Many to Many

In this type of network, Many inputs are fed to the network at several states of the network generating only one output.