BACK PROPAGATION

Agenda

- What is Back Propagation?
- How does the algorithm work?
- What is Back and Forward Propagation?
- What is a feed Forward Network?
- Types of Back Propagation Network
- Key points of Back Propagation
- Advantages of Back Propagation
- Disadvantages of Back Propagation

WHAT IS BACK PROPAGATION ?

What is Back Propagation ?

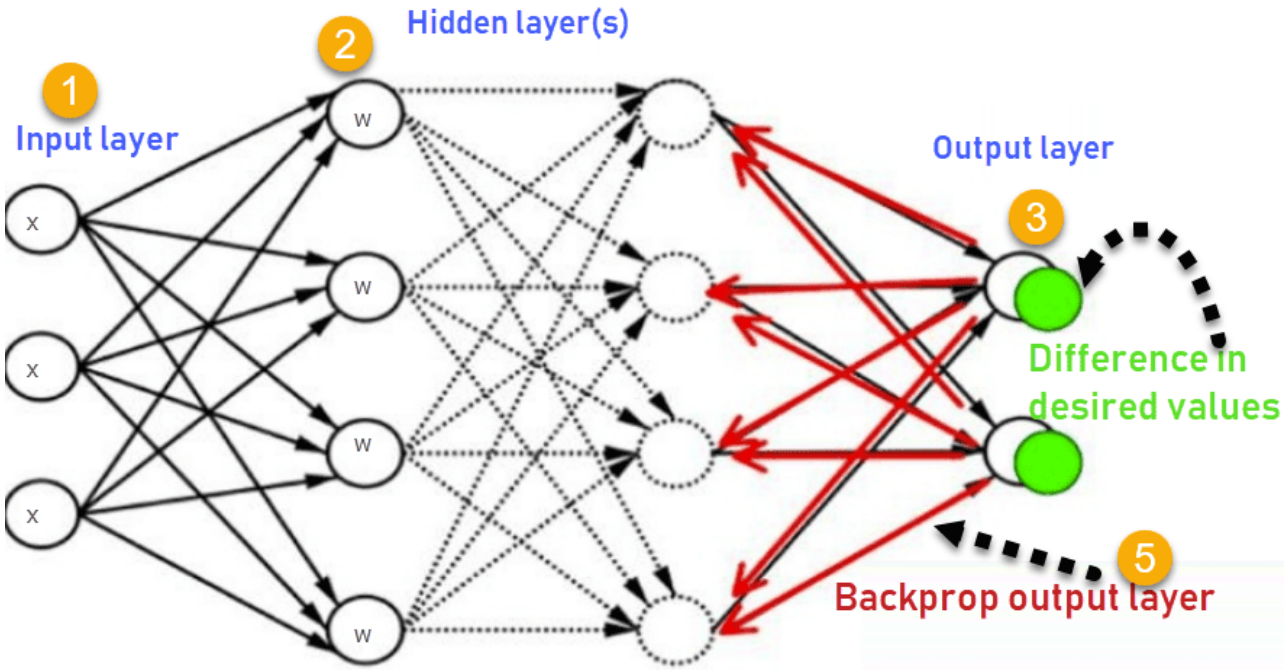
- In neural net training, Back Propagation plays an essential part.
- Back Propagation is the process of obtaining the previous iteration(i.e. epoch), of the fine-tuning for the weights of a loss (i.e. error rate) based on the neural Net.
- Correct and proper tuning of the weights helps to lower the error rates, and the Model is made reliable by the increasing of the generalization.

HOW DOES THE ALGORITHM WORKS ?

How does the algorithm works ?

In Back Propagation we have three main layers :

1. Input layer
2. Hidden layer
3. Output layer



How does the algorithm works ?

This image summarizes the functioning of the Back Propagation

1. Input layer receives x
2. Input is modeled using weights w
3. Each hidden layer calculates the output and data is ready at the output layer
4. Difference between actual output and desired output is known as the error
5. Go back to the hidden layers and adjust the weights so that this error is reduced in future runs

This process is repeated till we get the desired output. The training phase is done with supervision. Once the model is stable, it is used in production.

WHAT IS BACK AND FORWARD PROPAGATION ?

What is Back and Forward Propagation ?

A process to move from input layer(left) to the output layer (right) in Neural network is known as Forward Propagation.

A process to move from output layer(right) to the input layer(left) in Neural network is known as Backward Propagation.

For the intermediate variables in neural network, for the calculation and the storage from the input to the output layer.

WHAT IS A FEED FORWARD NETWORK ?

What is a feed Forward Network ?

- The another name for Feed Forward Network is Multi Layered Network (MLN)
- These networks are known as feed forward because the data travels forward in NN through input node, hidden layer and finally to output nodes.
- One of the simplest type of artificial neural network is feed Forward Network.

TYPES OF BACK PROPAGATION NETWORK

Types of Back Propagation Network

There are two types of Back Propagation Network :

1. Static Back Propagation

   In the static Back Propagation method, mapping of a static input generates the static output.

2. Recurrent Back Propagation

   The recurrent Back Propagation is conduction till the certain threshold is met, After this the error is calculated and propagated backwards.

KEY POINTS OF BACK PROPAGATION

Key points of Back Propagation

- It takes the advantage of the two rules i.e. power rule and chain rule which permits Back Propagation to work with the different number of outputs.
- For the error prone projects in the deep neural network, the Back Propagation is very much useful.
- For developing the relationship between input and hidden layers, you need to study the group of input and activation layers.

ADVANTAGES OF BACK PROPAGATION

Advantages of Back Propagation

The advantages of Back Propagation are :

1. It is fast, simple and easy to implement algorithm
2. It is a flexible network, so the previous knowledge regarding the network is not required.
3. There are no parameters to be tuned
4. This approach works very well in most of the cases.

DISADVANTAGES OF BACK PROPAGATION

Disadvantages of Back Propagation

The disadvantages of Back Propagation are :

1. The key to the overall data is holded by the input data.
2. For a mini-batch, matrix based approach is preferred.
3. Inaccurate output can be led by the noisy data.

Summary

Let’s take a recap of all the topics discussed so far.

Thank You