Applied Natural Language Processing
Prof. Ramaseshan Ramachandran
Department of Computer Science and Engineering
Indian Institute of Technology, Madras

Lecture – 32
Biological Neural Network

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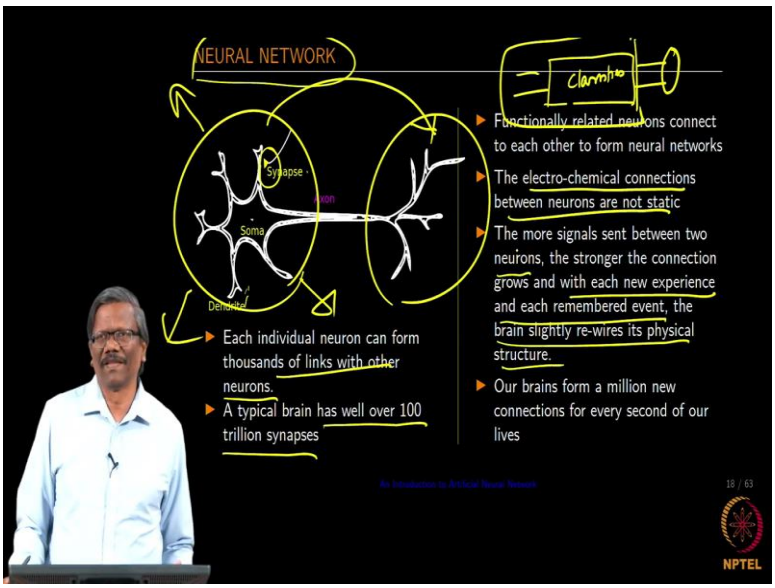

So, we have so far seen some fundamental elements of how we can really classify a certain set of variables using a decision surface especially in the case were the points are linearly separable, ok. So, now, we have to see whether the same thing is possible using the neural network, all right. So, we are going to be applying a similar principle and then show later that it is possible to do the linear separation using a perceptron, ok. So, before that you know as very simple and a brief introduction related to the neural network that we have, ok.

So, this is the biological neural network, this is the real one and then artificial neural network. It is supposed to copy some aspects of what happens inside the brain, ok. So, this is a very complex mechanism, we know very well. Think about that poor kid, right who is trying to recognize the faces of so many people even at a very young age without any input parameters provided. So, you remember that right.

So, in this case we estimated the complex function of a classifier based on the input and the class that is given. So, what we are providing to the kid is only this? So,

unfortunately, the kid has to do the whole thing, correct our brain is so wonderful and it is an I do not know whether you can call it as a machine, it is a beautiful set of biological pieces that gives you the ability to do lots of things and we are trying to see how those things could be taught to the machines you know step by step. And a very simple implementation of what happens inside our brain is done through the current neural net models and so on. So, for that you know we need to understand the little bit about what is there in the biological neural network and then move to the artificial one.

So, this is a neuron and it has several dendrites coming in which are providing the inputs, ok. And then, the incoming signals are coming through the synapse and then we have one axon that is like an output function that carries the electrochemical signals between neurons, ok. So, that is what we have. So, in this case there is an input that is coming in, and the electrical signals are carried between one neuron to the other through axons, ok. And there are plenty of them you know in the brain.

So, in this case, you will have a similar structure of this and on this side too and here, here, here and so on, plenty of them. So, each neuron can form 1000s of links with the electrochemical connections between neurons that are not static they keep changing, ok. More signal sent between two neurons, the stronger the connection grows with each new experience and each remembered event the brain slightly re-wires the physical structure. So, every time the more signal there are sent between the connections the strength starts to increase.

The smell of a coffee really triggers a lot of events, think about that, right. So, how many times you know you smell a coffee and then think oh ok, this is something that I have experienced you know when I was in my grandma's house. So, and then suddenly you know the, they housed there your grandma lived and then the surrounding, the gardens, the people of that you had met there and all those things start coming in into you, right. Because of that connection is pretty strong, you start remembering so many things. I am just quoting one example. For so many other people some other events could trigger a lot of chain of thoughts, ok. And we keep learning every time, then these strengths of the connections are increased every time based on how many ever times re-enforced that connection.