Deep Learning
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Lecture – 01
Chapter 4: From Cats to Convolutional Neural Networks

I will talk about the history of Convolutional Neural Networks, and I call this part of history as cats and it will become obvious why I call it so.

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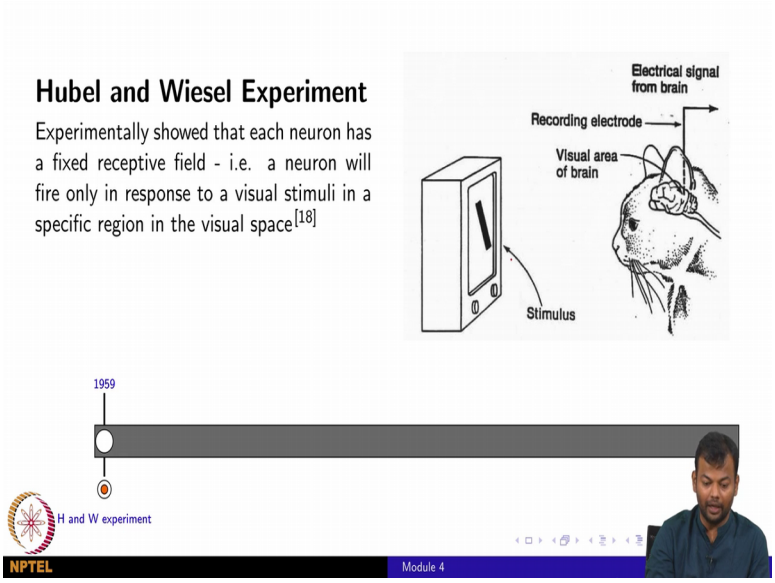

So, around 1959 Hubel and Wiesel did this famous experiment they are still I think you could see some videos of it on YouTube, where there is this cat and there was a screen in front of it and I will screen there were these lines being displayed at different locations and in different orientations right. So, slanted, horizontal, vertical and so on and there are some electrodes fitted to the cat and they were measuring trying to measure that which parts of brain actually respond to different visual stimuli.

Let us say if you show it stimulus at a certain location, there is a different part of the brain fire and so on right. So, and one of the things of outcomes of the study was that, that different neurons in brain fire to only different types of stimuli, it is not that all neurons in brain always fire to any kind of visual stimuli that you give to them right.

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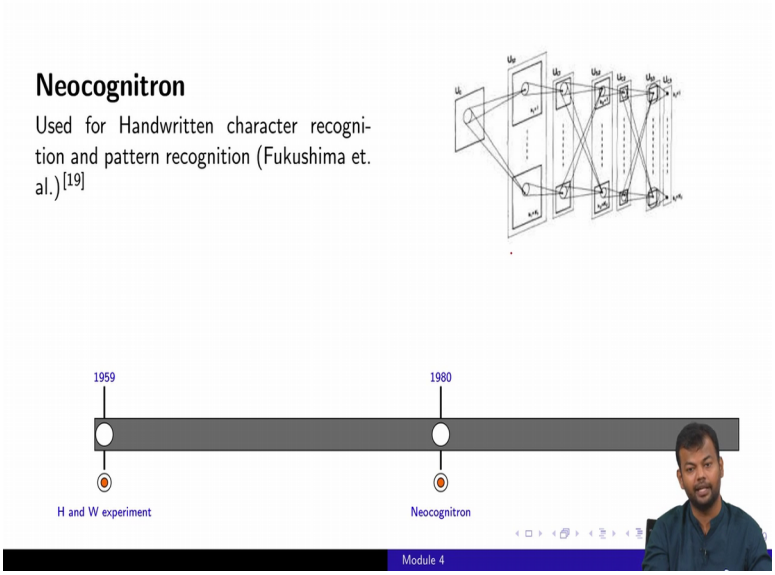

So, this is essentially roughly the idea behind convolutional neural networks starting from something known as Neocognitron, which was proposed way back in 1980. You could think of it as a very primitive convolutional neural network, I am sure that most of you have now read about or heard about convolutional neural networks, but something very similar to it was proposed way back in 1980.

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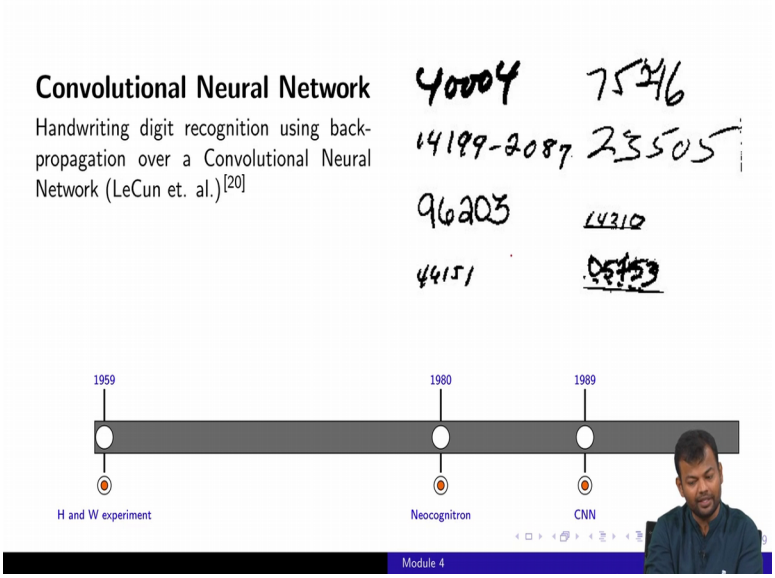

And what we know as the modern convolutional neural networks maybe I think Yan Li Kun is someone who proposed them way back in 1989, and he was interested in using

them for the task of handwritten digit recognition and this was again in the context of postal delivery services right. So, lot of pin codes get written or phone numbers get written on the postcards and there was a requirement to read them automatically. So, that they can be the letters or postcards can be separated into different categories according to the postcard according to the postal code and so on right so or the pin code.

So, that is where this interest was there and 1989 was when this convolutional neural networks were first proposed or used for this task.

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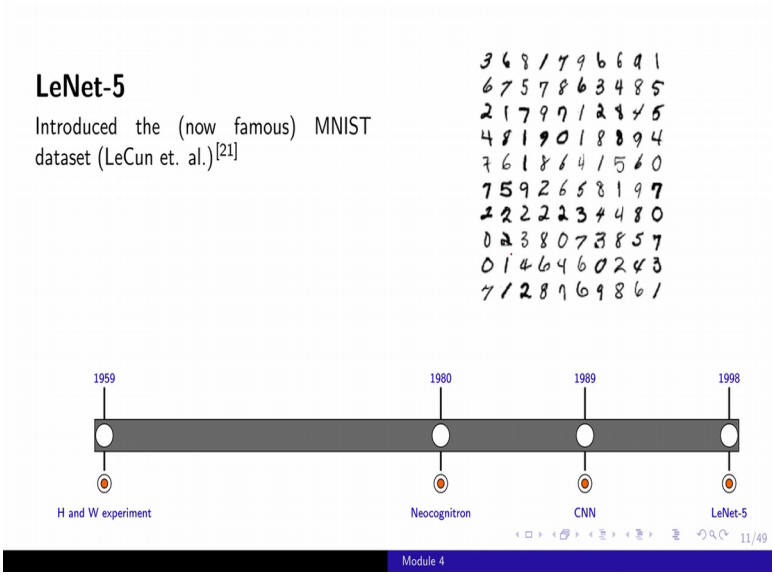

And then over the years, several improvements were done to that; and in 1998 this now how famous data set the emulous data set which is used for teaching deep neural networks, courses or even for initial experiments with various neural network based networks. This is one of the popular data sets, which is used in this field and this was again released way back in 1998 and even today even for my course I use it for various assignments and so on.

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So, it is interesting that an algorithm which was inspired by an experiment on cats is, today used to detect cats in videos of course, among other various other things is just I am just jokingly saying this.