



## **NPTEL ONLINE CERTIFICATION COURSES**

**Course Name: Deep Learning**

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**Department : E & ECE, IIT Kharagpur**

**Topic**

**Lecture 17: Nonlinearity**

## CONCEPTS COVERED

### Concepts Covered:

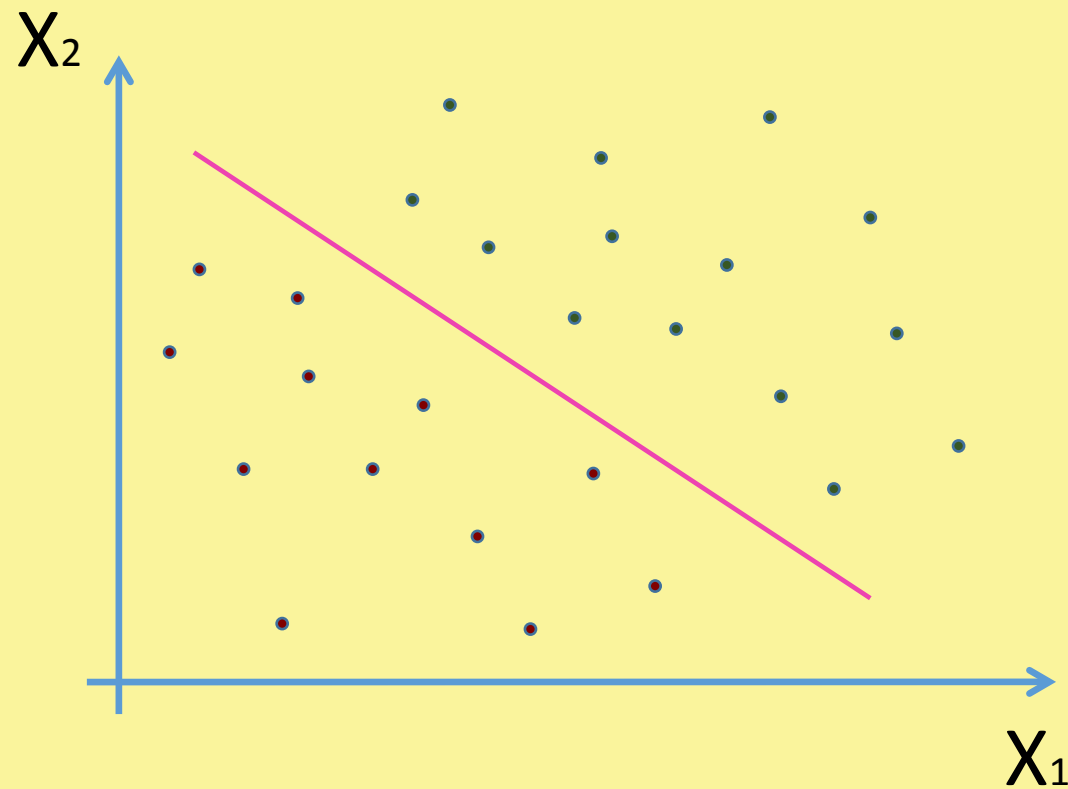
- ☐ Optimization in ML
- ☐ Linear and Logistic Regression
- ☐ Softmax classifier
- ☐ Nonlinearity
- ☐ Neural Network



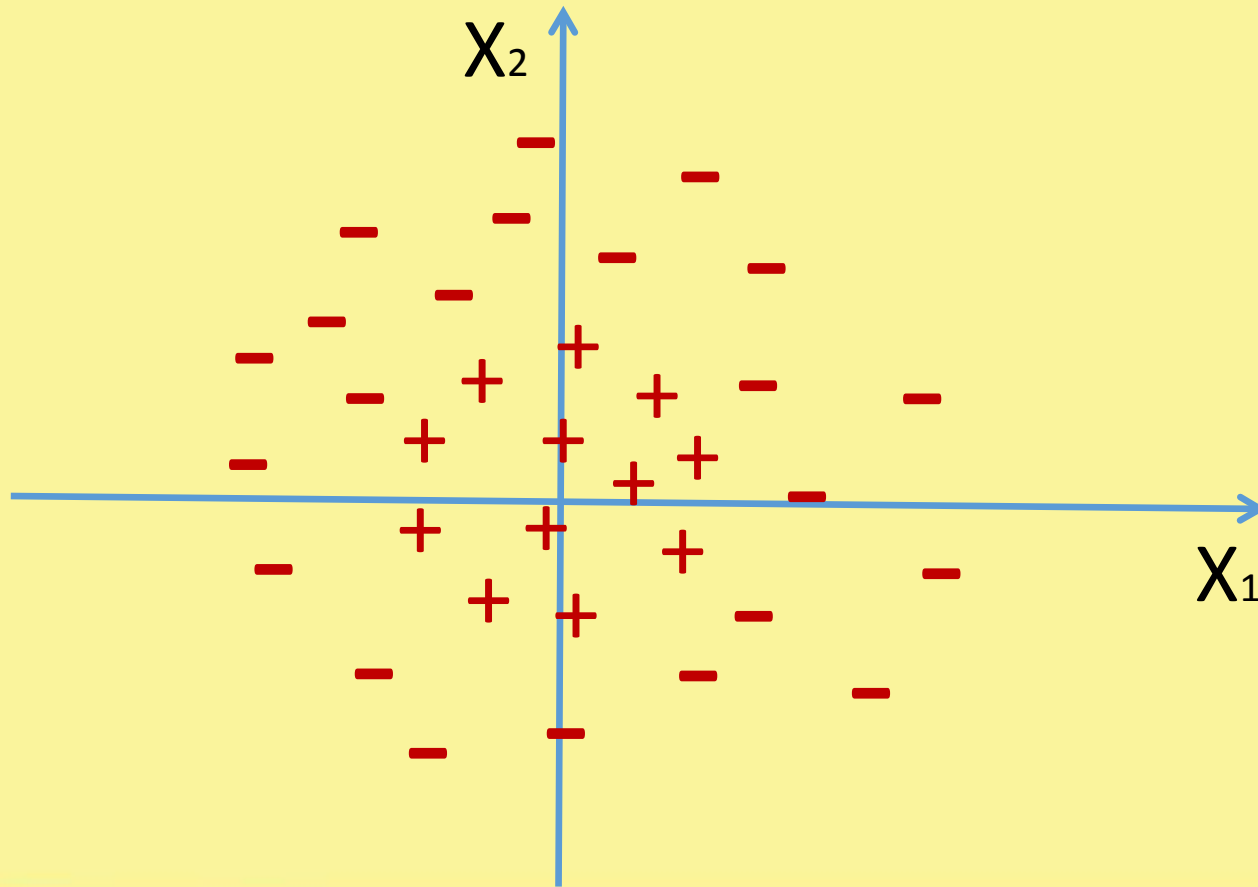
# Nonlinearity



# Linear Seperability



# Nonlinearity

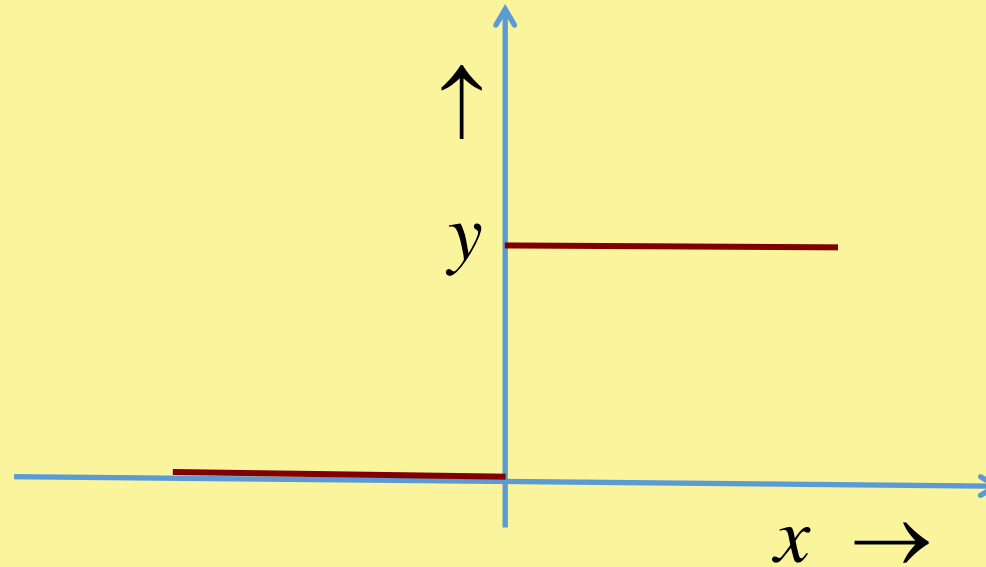


# Nonlinearity



# Threshold

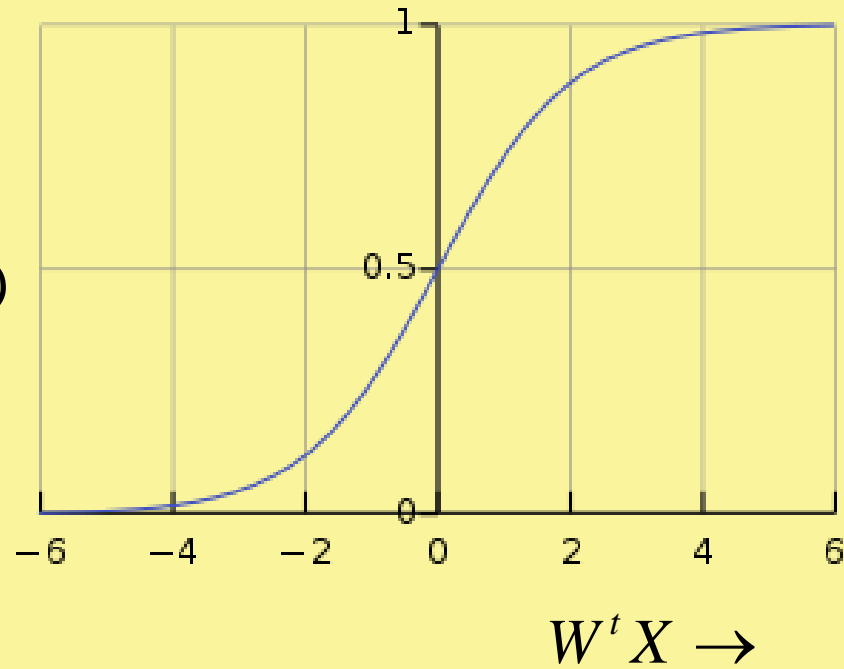
$$y = \begin{cases} 1 & x \geq 0 \\ 0 & x < 0 \end{cases}$$



# Logistic Regression

$$\sigma(W^t X) = \frac{1}{1 + e^{-W^t X}} \Rightarrow$$

↑  
 $\sigma(W^t X)$

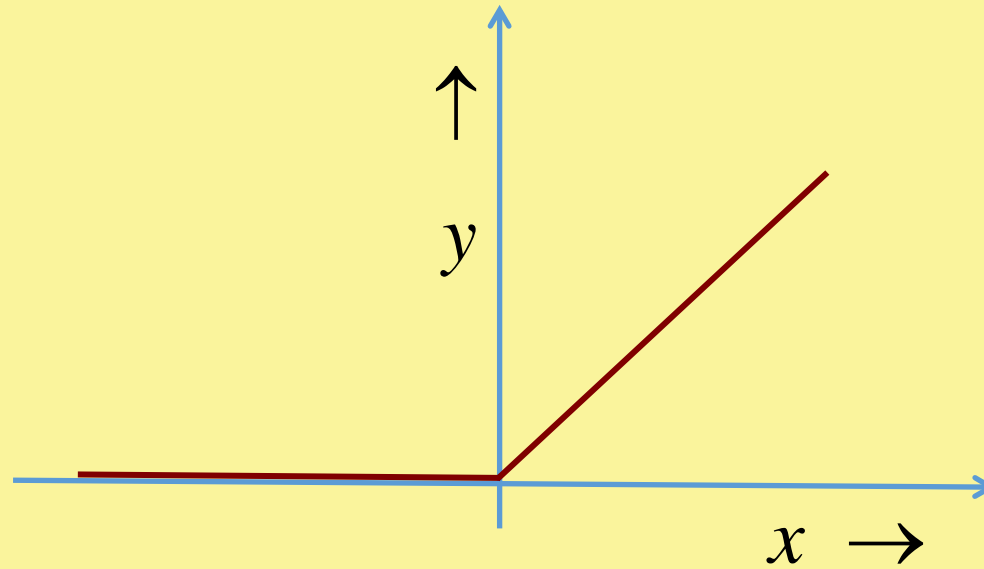




# Nonlinearity

ReLU : Rectified Linear Unit

$$y = \max(0, x) \Rightarrow$$





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*Thank  
you*

