



SNS COLLEGE OF ENGINEERING



Kurumbapalayam(Po), Coimbatore – 641 107

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Department of AI &DS

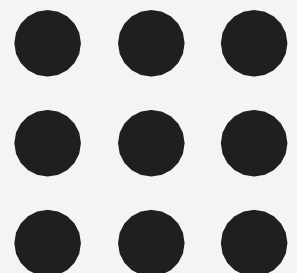
Course Name – 19AD602 DEEP LEARNING

III Year / VI Semester

Unit 2-DEEP NETWORKS

Topic:VC DIMENSIONS

GULSHAN BANU.A/AP/AI AND DS /VC DIMENSION /SNSCE

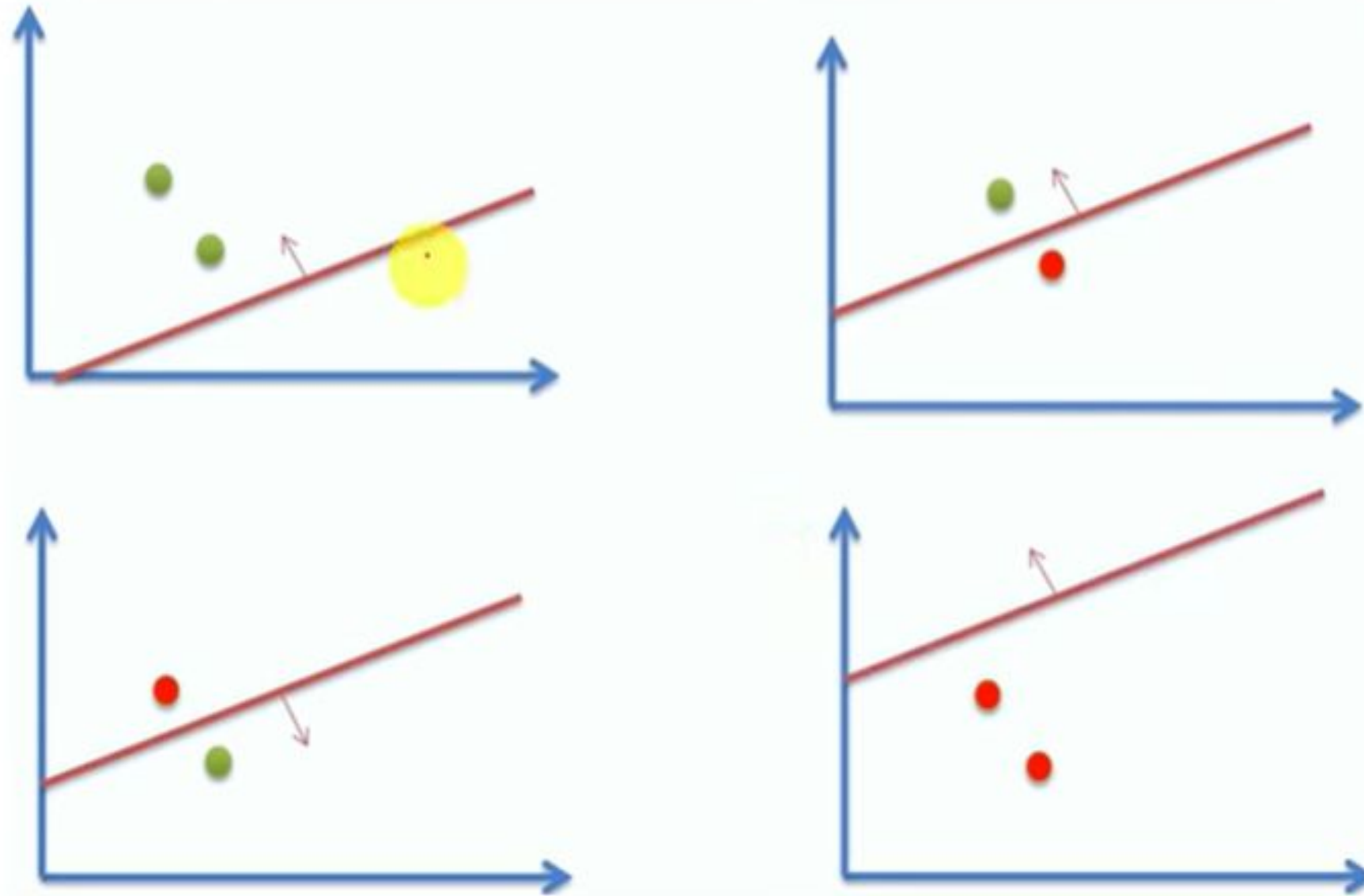


Vapnik – Chervonenkis (VC) Dimension

- It was introduced by Vladimir Vapnik and Alexey Chervonenkis in the 1970s and has become a fundamental concept in statistical learning theory.
- The VC dimension of a hypothesis set H is the largest number of points that can be shattered [✓] by H.
- A hypothesis set H shatters a set of points S if, for every possible labeling of the points in S, there exists a hypothesis in H that correctly classifies the points.

Vapnik – Chervonenkis (VC) Dimension

- If there are 2 data point, then there are $2^2 = 4$ different classifiers exists.





VC DIMENSION



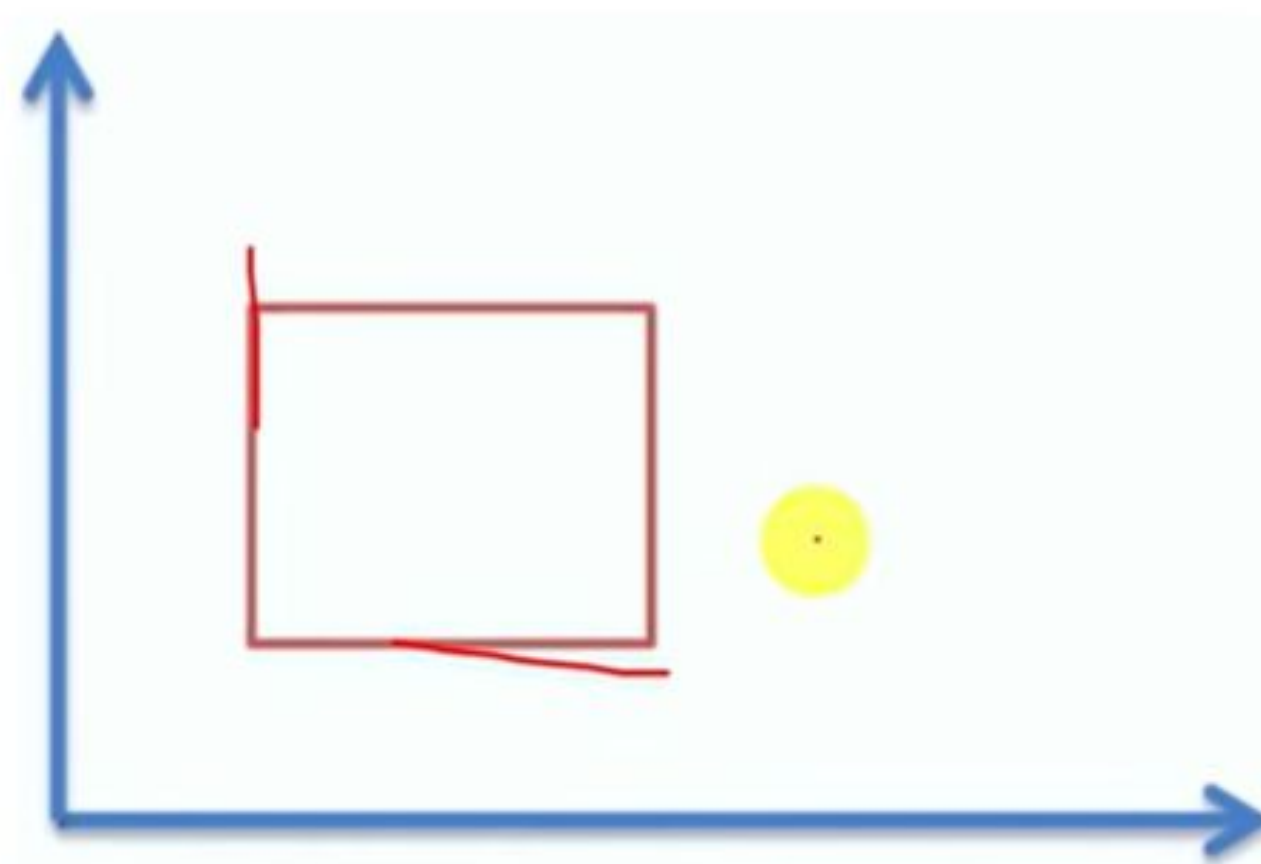
Vapnik – Chervonenkis (VC) Dimension i

- If there are 4 data point, then there are $2^4 = 16$ different classifiers exists.
- **The Maximum Number of data points that can be shattered by a straight line in 2-Dimissional space is 3.**



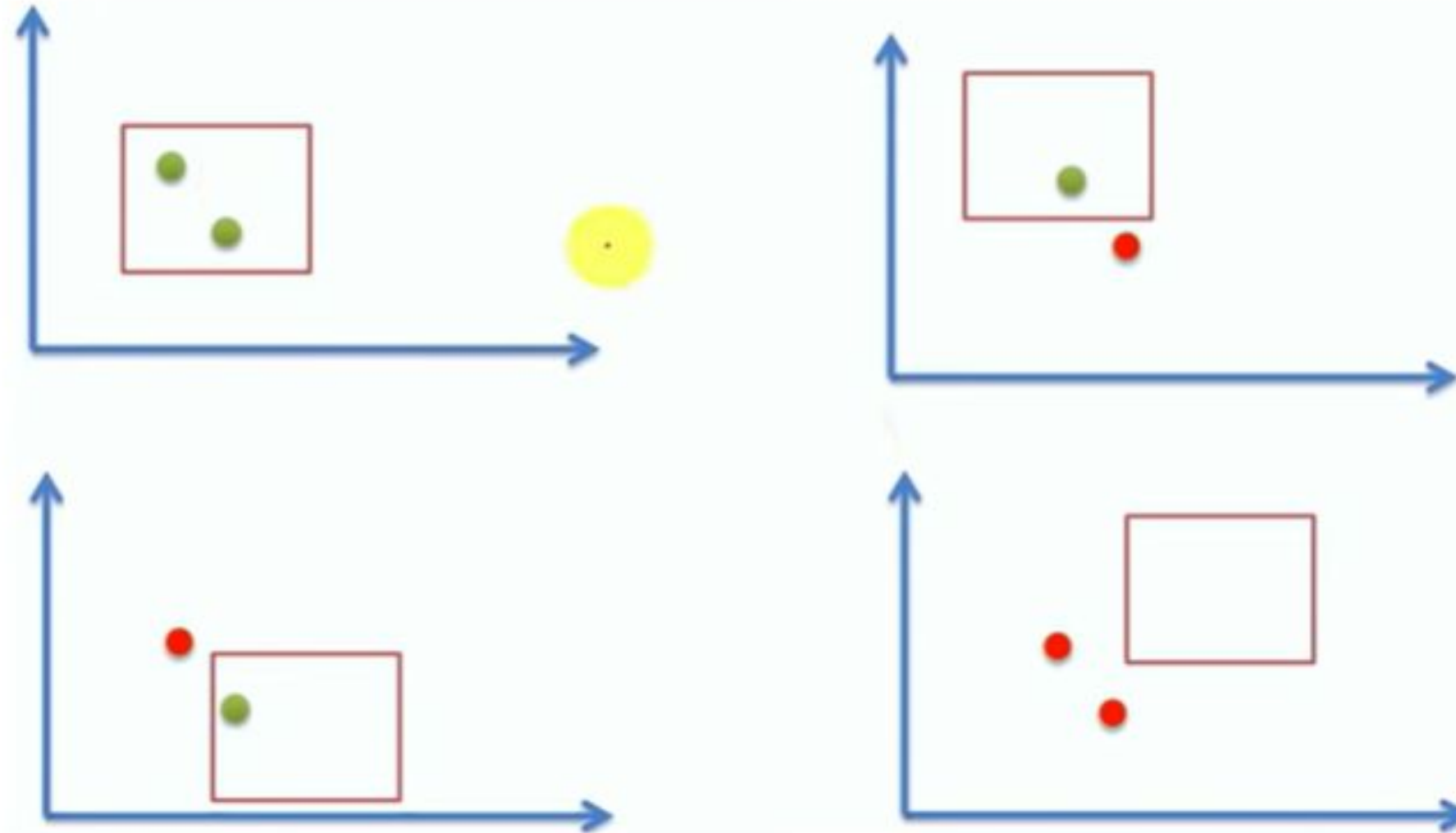
Vapnik – Chervonenkis (VC) Dimension

- Axis aligned rectangle



Vapnik – Chervonenkis (VC) Dimension

- If there are 2 data point, then there are $2^2 = 4$ different classifiers exists.



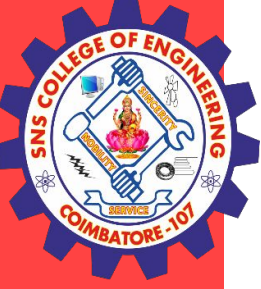


VC DIMENSION



Applications of VC Dimension

- The VC dimension has a wide range of applications in machine learning and statistics.
- For example, it is used to analyze the complexity of neural networks, support vector machines, and decision trees.
- The VC dimension can also be used to design new learning algorithms that are robust to noise and can generalize well to unseen data.
- The VC dimension can be extended to more complex learning scenarios, such as multiclass classification and regression.



VC DIMENSION



THANK YOU