

Assignment

Support Vector Machine.

- Aim: Implement SVM for performing classification and find its accuracy on the given data. (Using Python)
- Theory

Support Vector Machine:

Generally SVM is ~~considers~~ considered to be a classification approach, it but can be employed in both types of classification if regression problem.

SVM constructs a hyperplane in multidimensional space to separate different classes. SVM generates optimal hyperplane in an iterative manner. which is used to minimize an error. The core idea of SVM is to find a

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~~minimize an error~~
marginal hyperplane that best divides the datasets to classes.

• Process

The main objective is to segregate the dataset in the possible way by selecting the best hyperplane with maximum possible margin.

To do that, SVM follows the following steps.

i) Generate hyperplane which segregates the classes in the best way.

ii) Select the right hyperplane with the maximum segregation from the either nearest data point.

for non-linear and planes SVM uses a kernel trick to transform the input space to a higher dimension space.

- SVM kernel.

i) Linear kernel :- It can be used as a normal dot product of any two given observation. The product between two vectors is the sum of the multiplication of each pair of input values.

$$K(x, x_i) = \text{Sum}(x * x_i)$$

ii) Polynomial Kernel - It is a more generalized form of the linear kernel. The polynomial kernel can distinguish curved or non-linear input space.

$$K(x, x_i) = \text{it sum}(x * x_i)^d$$

Conclusion.

In This assignment we have implemented the support vector machine algorithm on the Bill authentication dataset.