

True Positive:

True positive occurs when the model correctly predict positive class

The first word "True" is the reality of the prediction. i.e. In this case the prediction is true. And it is for Positive class.

For example: If we are classifying dog vs not dog so the dog is positive class and not dog whatever the thing is its negative class.

~~If there are 6 dog images & 1 not dog images~~

If the model predicts 7 images as dog images and out of 7 4 are dog images so

True Positive = 4
Reality \downarrow our positive class (Dog)

False Positive :

False Positive occur when model predict positive class but the actual class is negative

So its wrong prediction.

Example: In the Dog example model Predicted 7 images as dog images out of 7 four were dog and the 3 images were not a dog but the model predicted it to be a dog so

False Positive = 3
Reality our class (Dog)

True Negative :

True negative occur when the model correctly predict negative class

Example: If the model predicts 3 images as not a dog (negative class) and out of 3 only 1 image is not a dog so the model Predict only 1 image right

True Negative = 1
Reality our negative class (not a dog)

In reality ~~the~~ in the negative class

the model, only 1 image true.

Predicted

False Negative :

False negative occurs when the model predict it to be negative class but in reality it is a Positive class

Example : If model Predict 3 images as not a dog (negative class) but 2 of them are dog images

So the model Prediction is false for the negative class

$$\text{False Negative} = 2$$

Reality our -ive class (not a dog)

Think about prediction made by model when you try to find these.

Accuracy: The overall correctness of models

Prediction.

It is ratio of correct prediction to total number of samples

$$\text{Accuracy} = \frac{\text{Total correct predictions}}{\text{Total samples}}$$

OR

$$\text{Accuracy} = \frac{\text{True Positive} + \text{True negative}}{\text{Total samples}}$$

It can be misleading when classes are imbalanced
high accuracy may not reflect models actual performance.

Precision :

Precision is metric that focus on ~~out~~ correct positive prediction out of all positive prediction.

Example: In the Dog example, out of all dog predictions how many are correct. If the model predicted 7 images to be dog images and out of 7 images 4 are dog images (correct or True Positive) and 3 are not a dog images (incorrect or false positive).

$$\text{Precision} = \frac{\text{True Positive}}{\text{True Positive} + \text{False Positive}}$$

↓
Total no. of Prediction for
Positive class (dog)

In Precision think about prediction made for Positive class (Dog) in our example

In Precision think about prediction as your base line

Precision is done for every class above we have done it for dog class we can also do it for not a dog class.

Recall:

The ability of a model to correctly identify the positive instances from total actual positive instances. It is ratio of true positive to the ~~actual~~ number of actual positives.

Example: In Dog example out of all dog truth

~~know~~ how many you got right. In reality we have total 6 dog images and model Predicted 4 to be dog images so

$$\text{Recall} = \frac{4}{6}$$

Recall = True Positive

True Positive + False negative