World Class Machine Learning

Machine Learning Hub

F Scores

Posted on July 12, 2018 by Jonathan Steele

Introduction

This is a Follow-up article to the article about Precision and Recall in the Context of Skewed Classes.

First, just let me say that Andrew Ng does a great job of explaining all of this in his Machine Learning course during the second half of Wk 6.

What is an F Score and what is it used for?

An F Score is a value used as a evaluation metric used to judge the performance of a machine learning model, especially in applications where there are skewed classes.

How do I calculate an F Score?

To calculate a F Score, you use the equation

2 * P * R / (P + R)

where P = Precision and R = Recall and both values are between 0 and 1.

is a way to combine your Precision and Recall values into just one value to measure the performance of a machine learning model.

Why does the F Score equation work?

It works because it requires both Precision AND Recall to be moderately high. Let's say that you have 3 different models that you've evaluated with Precision and Recall values:

1. P = 0.4 ; R = 0.5
2. P = 1.0 ; R = 0.1
3. P = 0.05 ; R = 1.0

The associated F scores are below

1. F = 0.44
2. F = 0.18
3. F = 0.095

If you were to simply take the average (P + R / 2) :

1. 0.45
2. 0.55
3. 0.525

We know from our Skewed Classes discussion, that the P and R values from model 2 and 3 definitely resemble a simplistic y=1 or y=0 model where the model is not sophisticated or helpful in any way.

With a simple average, the simplistic models are easily beating out the much better model 1 which has both great Precision and great Recall, which we DO NOT want.

The F Score, on the other hand, correctly shows that the combination of higher precisions AND recall is much more valuable.

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