

EVALUATION **METRICS**

CLASSIFICATION METRICS



01

CONFUSION MATRIX

02

PRECISION

03

RECALL

04

PRECISION - RECALL TRADEOFF

05

ROC

06

AUC



CONFUSION MATRIX

		Actual Value	
		Positive	Negative
Predicated Value	Positive	TP	FP
	Negative	FN	TN

Confusion Matrix

TP

Actual class

Predicted class

	Apple	Banana	Mango	
Apple	4	2	3	FP
Banana	1	5	2	
Mango	4	3	6	
	FN		TN	

FN

TN

FP

PRECISION AND RECALL



$$\textit{Accuracy} = \frac{TP + TN}{TP + TN + FP + FN}$$

$$\textit{Precision} = \frac{TP}{TP + FP}$$

$$\textit{Recall} = \frac{TP}{TP + FN}$$

$$F_1 = 2 \cdot \frac{\textit{Precision} \cdot \textit{Recall}}{\textit{Precision} + \textit{Recall}}$$

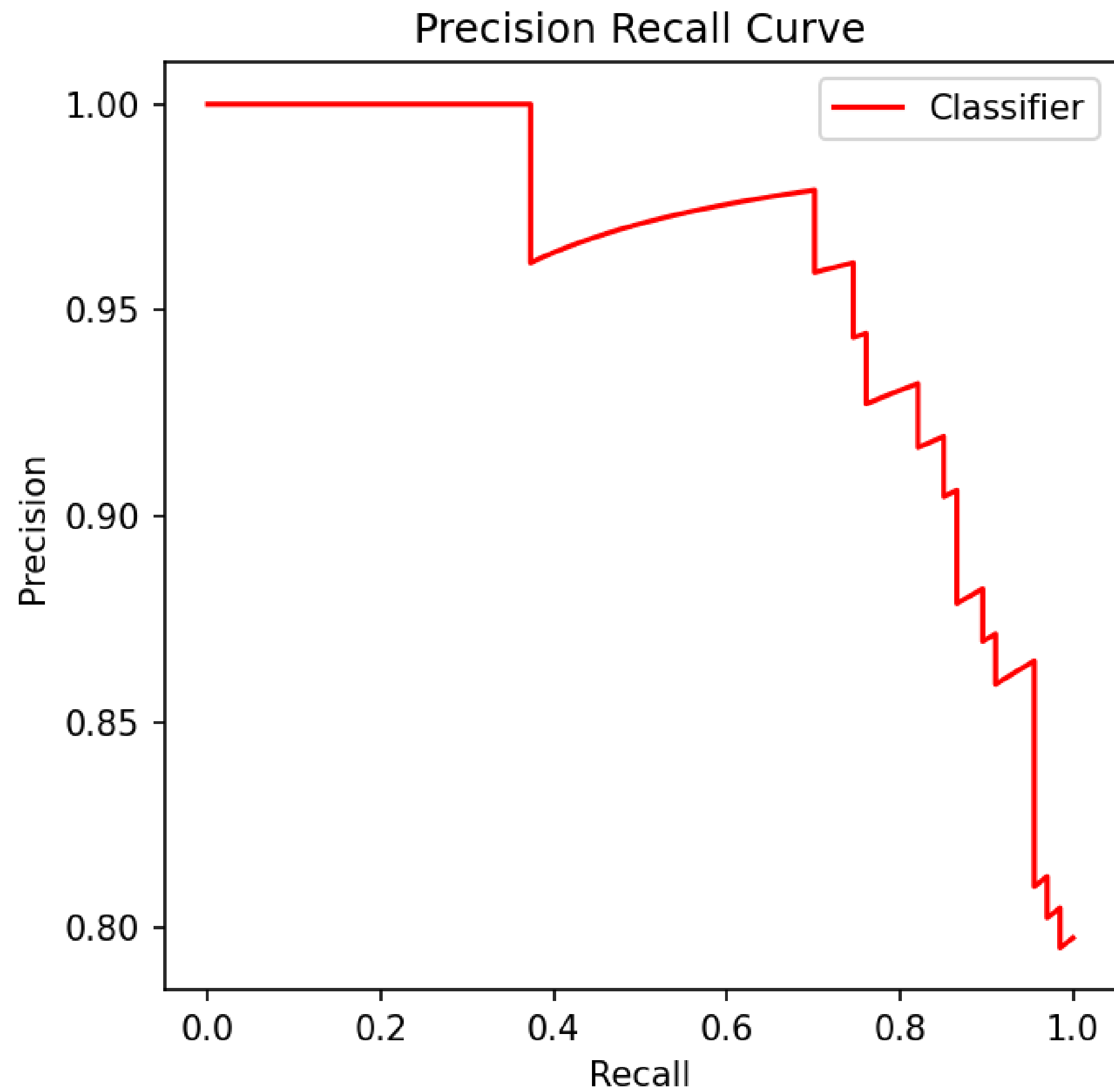
PRECISION - RECALL TRADEOFF

Discussion

SPAM CLASSIFIER

CANCER DETECTION





RECEIVER OPERATING CHARACTERISTIC(ROC) CURVE

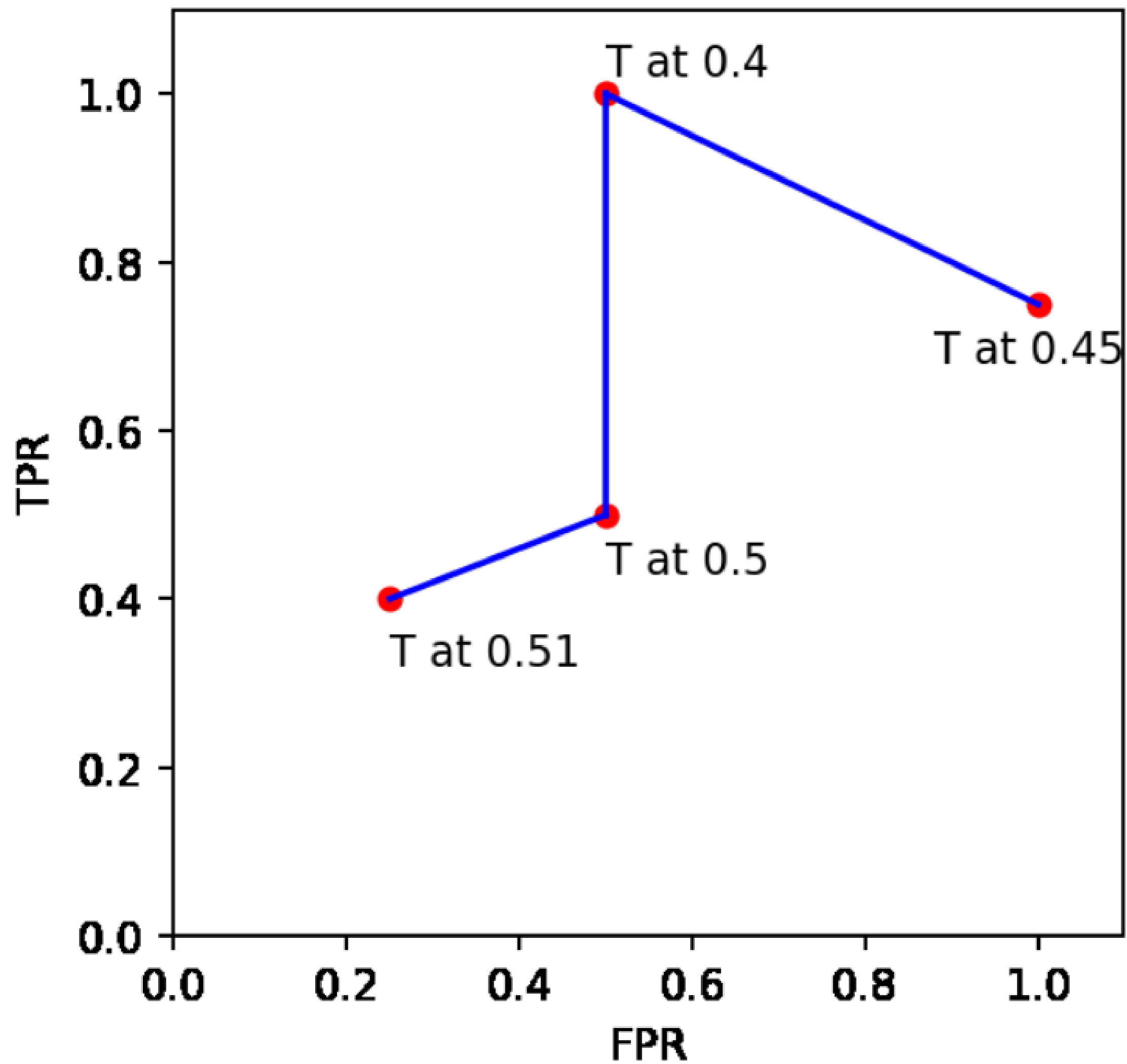


Need for ROC

- PRECISION RECALL CURVE HAD MORE FOCUS ON POSITIVE CLASS

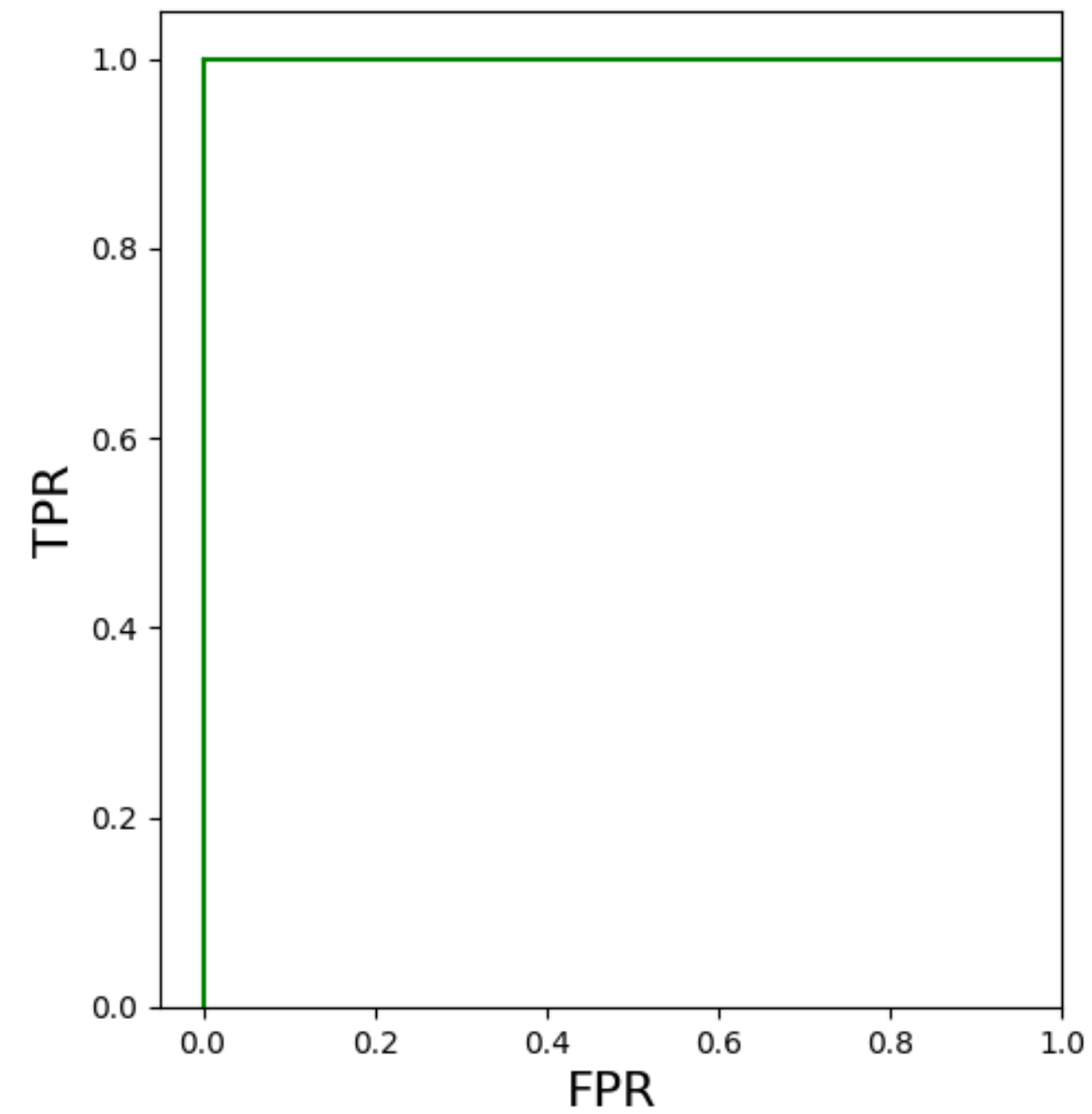
$$\text{TPR} = \frac{\text{TP}}{\text{TP} + \text{FN}}$$

$$\text{FPR} = \frac{\text{FP}}{\text{FP} + \text{TN}}$$

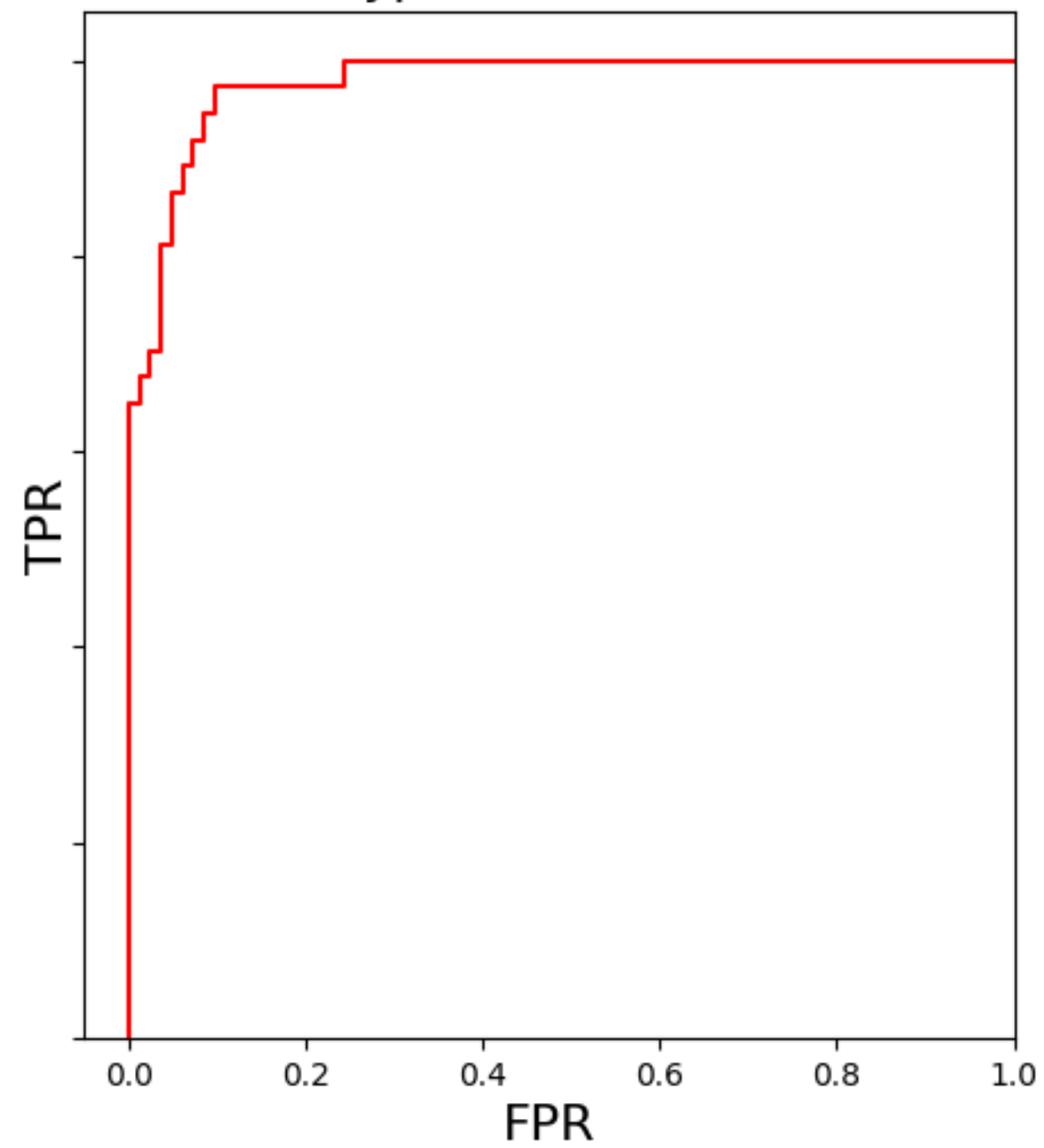


ROC Curve

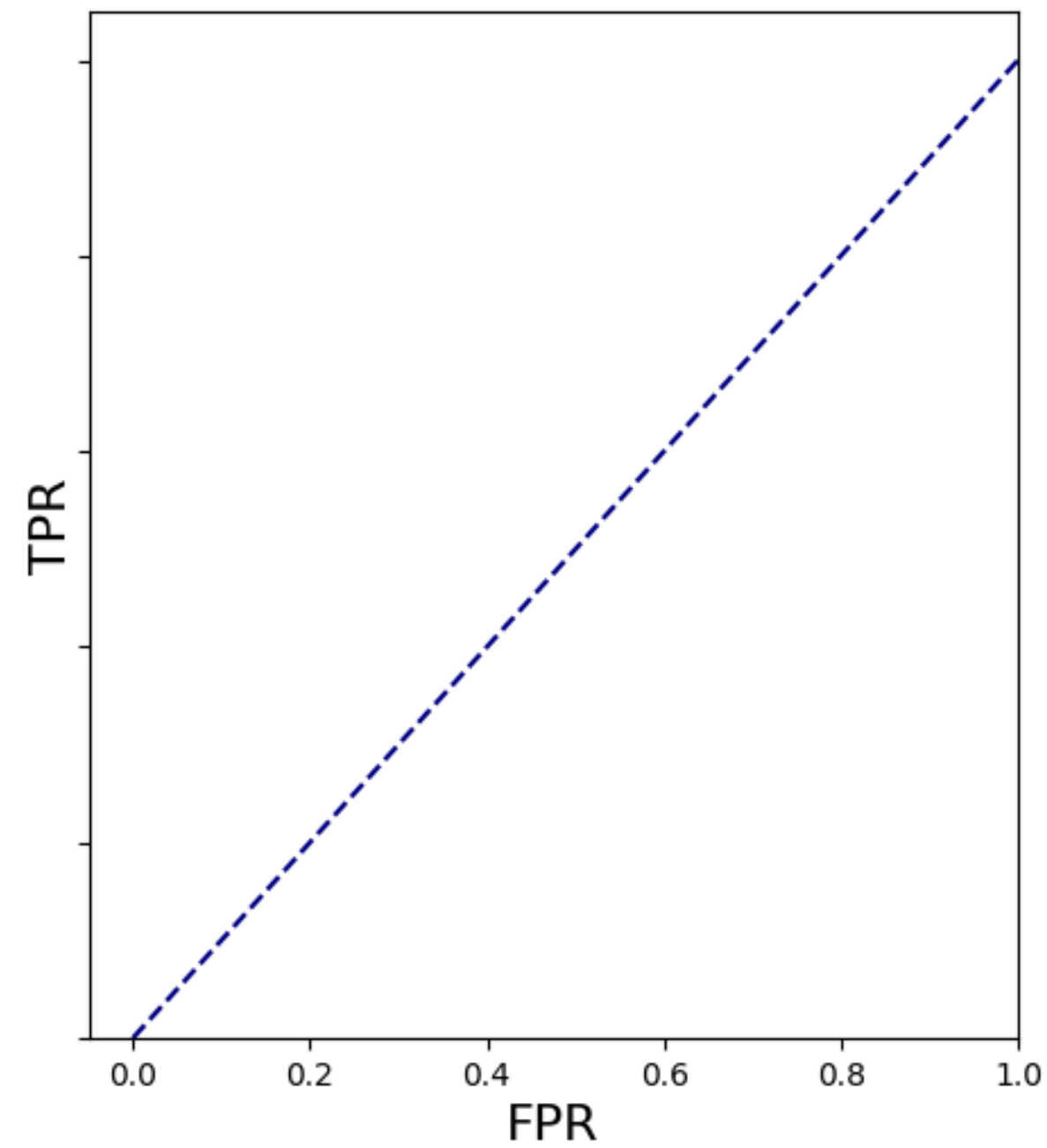
Perfect Classifier



Typical Classifier



Random Classifier



The background features four decorative geometric patterns in the corners. The top-left corner has a series of parallel diagonal lines in a light blue-grey color. The top-right corner contains a cluster of overlapping semi-circles in yellow, red, teal, and dark blue. The bottom-left corner also features a cluster of overlapping semi-circles in red, teal, and dark blue. The bottom-right corner has a series of parallel diagonal lines in a light blue-grey color, mirroring the top-left pattern.

THANK YOU