PR AUC vs. ROC AUC

Confusion Matrix:

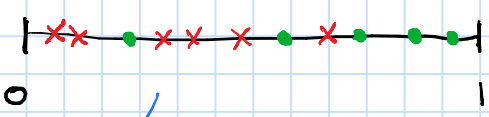
Actual \ Predicted	1	0
1	TP	FN
0	FP	TN

Recall (TPR): $\frac{TP}{TP + FN}$

FPR: $\frac{FP}{FP + TN}$

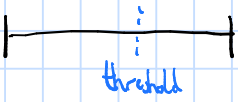
Precision: $\frac{TP}{TP + FP}$

Imagine a (sorted) binary classifier output



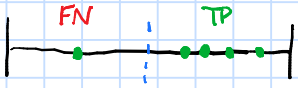
• 's are actual positives
X 's are actual negatives

PR/ROC AUC both depend on a moving threshold 1 → 0, e.g.



threshold induces a recall, FPR, and precision

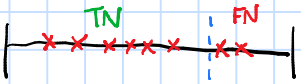
RECALL



"how many of the •'s have I caught?"

As threshold → 0 recall ↑

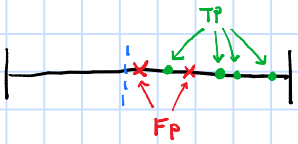
FPR



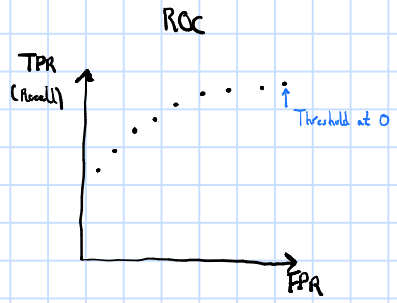
"how many of the x's have I (unfortunately) caught?"

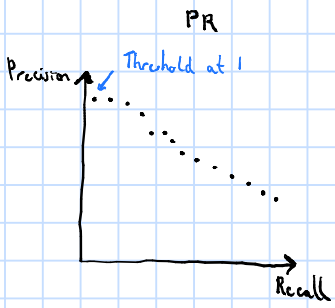
As threshold → 0 FPR ↑

PRECISION



"how polluted are my positive predictions?"





1) If classifier A's PR curve dominates classifier B's, then so does its ROC curve.

2) The PR-AUC or ROC-AUC value alone is close to useless.