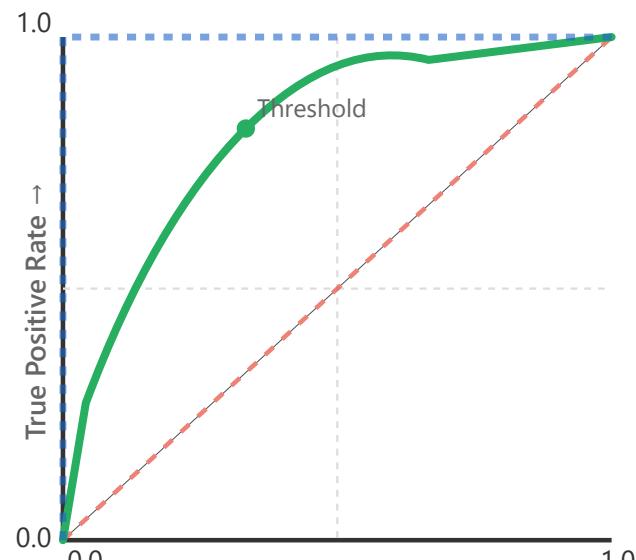


ROC Curve and AUC

ROC Curve Visualization



— Perfect (AUC=1.0) — Good (AUC≈0.85) — Random (AUC=0.5)

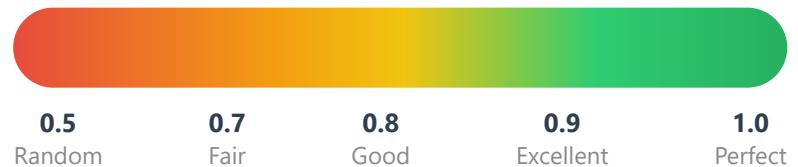
ROC Curve

Plots TPR vs FPR at various classification thresholds.
Shows model performance across all possible threshold settings.

AUC Score

Area Under the ROC Curve. Single number (0.5 to 1.0) summarizing overall classification performance.

AUC Interpretation Scale



Key Advantages

ROC Curve Construction: Step-by-Step Guide

1

Predicted Probabilities and Actual Labels

Sample	Predicted Probability	Actual Label
A	0.95	1 (Positive)
B	0.85	1 (Positive)
C	0.75	0 (Negative)
D	0.65	1 (Positive)
E	0.55	0 (Negative)
F	0.45	0 (Negative)
G	0.35	1 (Positive)
H	0.15	0 (Negative)

2

Calculate TPR and FPR at Each Threshold

Threshold = 0.80

Confusion Matrix			
	A+	A-	
P+	TP 2	FP 0	
P-	FN 2	TN 4	

TPR

$$2 / (2+2) = 0.5$$

Threshold = 0.60

Confusion Matrix			
	A+	A-	
P+	TP 3	FP 1	
P-	FN 1	TN 3	

TPR

$$3 / (3+1) = 0.75$$

Threshold = 0.40

Confusion Matrix			
	A+	A-	
P+	TP 4	FP 2	
P-	FN 0	TN 2	

TPR

$$4 / (4+0) = 1.0$$

50%

75%

100%

FPR

$$0 / (0+4) = 0.0$$

(0.00, 0.50)

FPR

$$1 / (1+3) = 0.25$$

25%

(0.25, 0.75)

FPR

$$2 / (2+2) = 0.5$$

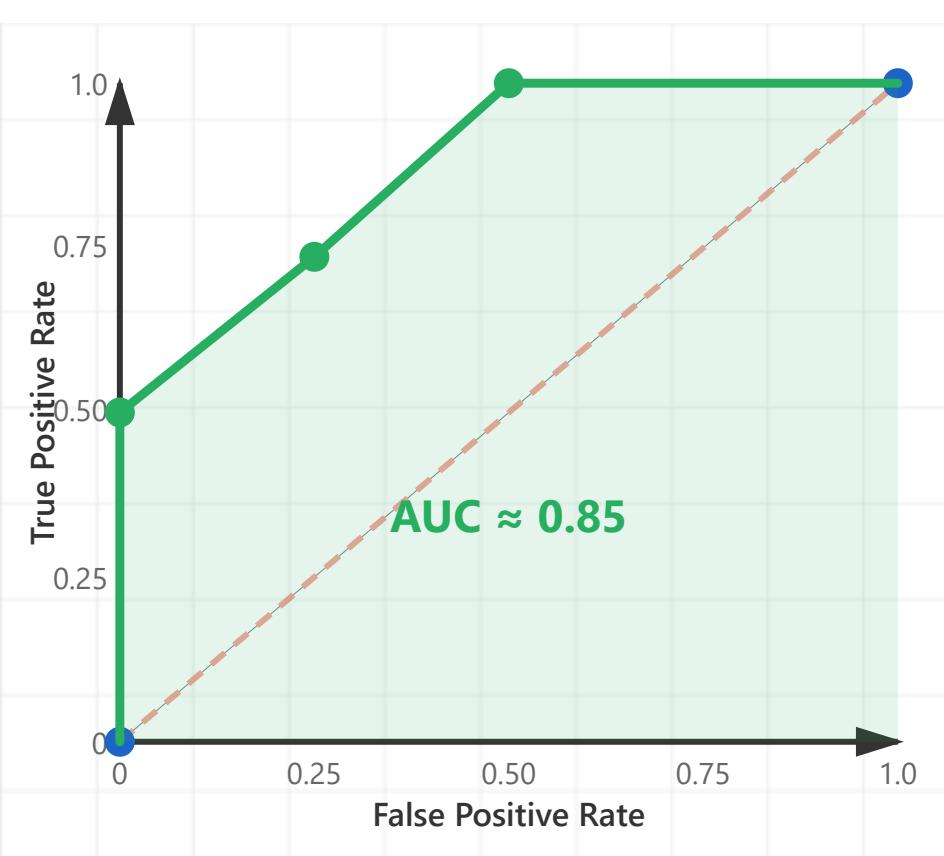
50%

(0.50, 1.00)

3

Connect Points to Create ROC Curve

- ◆ Calculate (FPR, TPR) coordinates for all thresholds
- ◆ Sort points by FPR in ascending order
- ◆ Connect points with lines to complete ROC curve
- ◆ Evaluate model performance using AUC



Key Summary

Step 1:

Predicted Probability과 Actual Label
준비

Step 2:

Calculate TPR and FPR at each
threshold

Step 3:

Connect coordinates to create curve

Result:

Higher AUC indicates better model