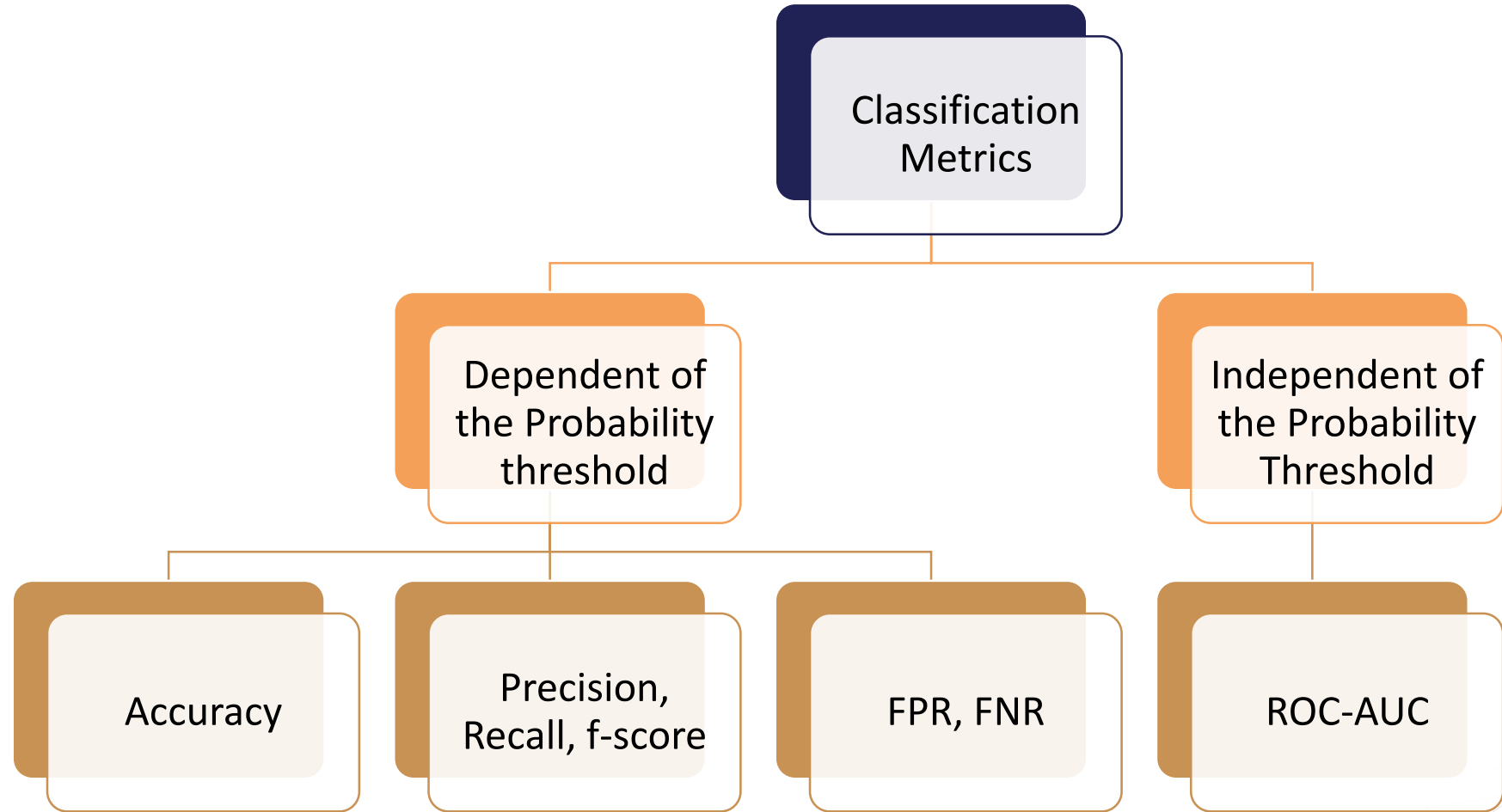




Classification Metrics

Overview

Classification Metrics



Accuracy

- Percentage or fraction of correct predictions
- Fraction of the predictions that the model got right.

$$Accuracy = \frac{\text{Number of correct predictions}}{\text{Total number of predictions}}$$

Confusion Matrix

	Predicted Negative	Predicted Positive
Actual Negative	TN	FP
Actual Positive	FN	TP

- **TN**: # of negative samples correctly classified - True Negatives
- **FP**: # of negative samples incorrectly classified as positive - False Positives
- **FN**: # of positive samples incorrectly classified as negative - False Negatives
- **TP**: # of positive samples correctly classified - True positives

Precision and Recall

- True Positive Rate (Recall or Sensitivity)

$$TP_{rate} = TP / (TP + FN)$$

- Positive Predictive Value (Precision)

$$PP_{value} = TP / (TP + FP)$$

- F1 score - weighted harmonic mean of precision and recall.

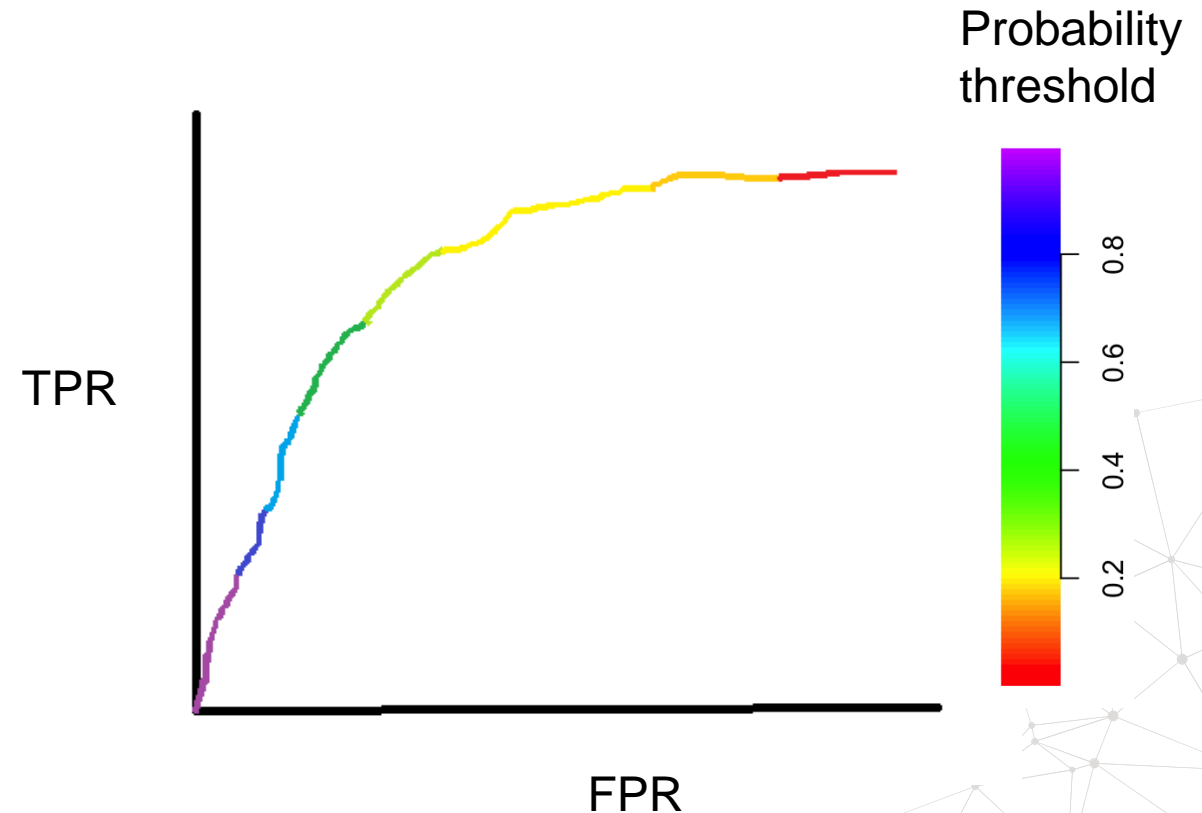
$$F1\ score = \frac{2 \times Precision \times Recall}{Precision + Recall}$$

FPR and FNR

- False Positive Rate, $FPR = FP / (FP + TN)$
- False Negative Rate $FNR = FN / (TP + FN)$

Receiving Operating Characteristic Curve (ROC Curve)

- Plots benefits (TPR) vs costs (FPR) at different classification thresholds.
- ROC-AUC: area under the ROC curve



Loss Function

$$L_{\log}(y, p) = -(y \log(p) + (1 - y) \log(1 - p))$$

THANK YOU

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