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Geometric mean, Dominance, Index of Imbalanced Accuracy

Precision and Recall

- True Positive Rate (Recall or Sensitivity)

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

- True Negative Rate

$$TN_{rate} = TN / (FP + TN)$$

- Positive Predictive Value (Precision)

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

- Negative predictive Value

$$NP_{value} = TN / (TN + FN)$$

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Geometric mean

- The G-Mean tries to maximize the accuracy on each of the classes while keeping these accuracies balanced

- The best value is 1 and the worst value is 0

$$G-Mean = \sqrt{\frac{TP}{TP+FN} \times \frac{TN}{TN+FP}} = \sqrt{sensitivity \times specificity}$$

Recall TNR

Dominance

- This measure ranges from -1 to +1.
- A value of +1 indicates perfect accuracy on the minority (positive) class, but all cases of the majority class are miss-classified.
- A value of -1 corresponds to the opposite situation.

Dominance = TPR- TNR = Recall - TNR

Index of imbalanced accuracy - IBA

- Quantifies a trade-off between an index of how balanced both class accuracies are and a chosen unbiased measure.

$$IBA_{\alpha}(M) = (1 + \alpha \cdot dominance)M$$

- Where (1 + dominance) is the weighting factor and M represents any performance metric

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THANK YOU

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