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Brier Score

Brier Score

- Metric that measures the accuracy of probabilistic estimates of the data.

- The average squared difference of the observed label vs the predicted probability

$$BS = \frac{\sum_{i=1}^{n} (\hat{p}(y_i) - y_i)^2}{n}$$

Brier Score: how to interpret it

- The Brier Score is small when the probabilistic estimates are close to the real class, and it increases as they diverge.
- It varies between 0 and 1
- Tends to work well with balanced data

Brier Score with imbalanced data

The effect of the rare observations does not affect the overall score.

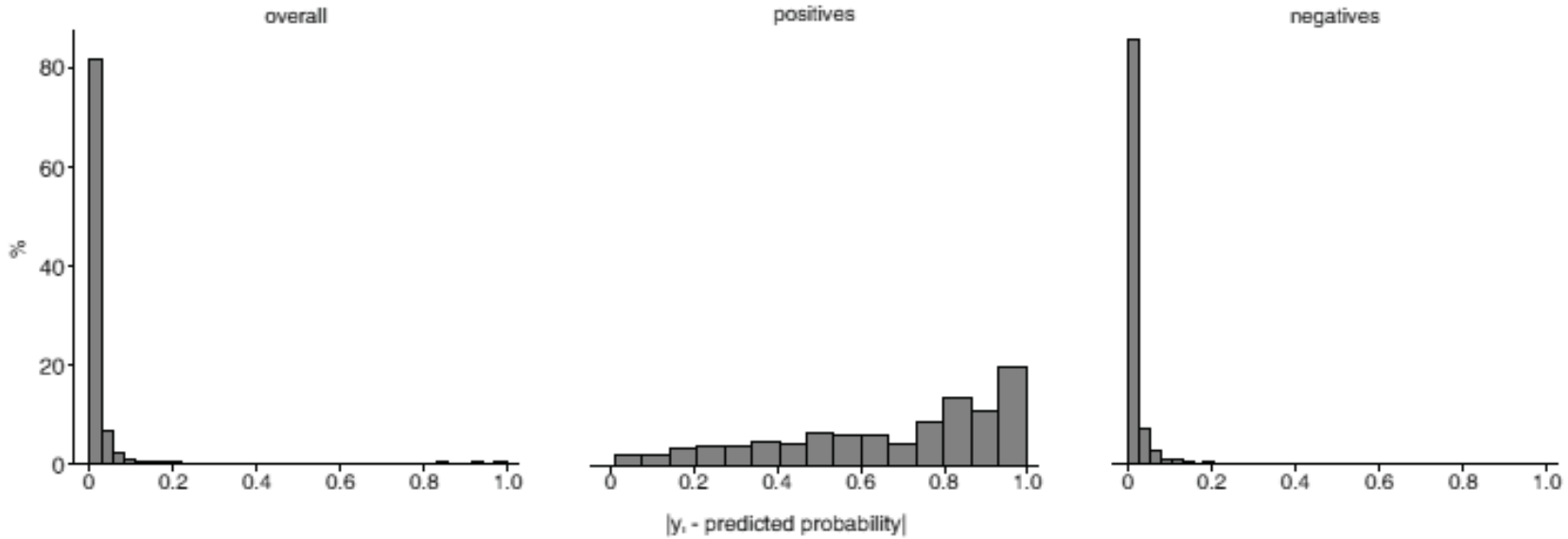

Figure 2. The bias of probability estimates attained via Platt regression for an imbalanced dataset. The x axis is the absolute difference between the observed labels and the corresponding probability estimates (i.e., $|y_i - \hat{P}\{y_i|x_i\}|$). Lower scores thus imply better calibration. Each plot is a histogram showing the densities of instances along this calibration metric. On the left, the histogram is shown for all instances; most instances are very near 0, implying good calibration. The middle and right-most plots show the corresponding histogram for the minority and majority classes, respectively. One can see that calibration is quite poor for the former class.

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THANK YOU

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