Performance Metrics

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The following evaluation metrics were used: global accuracy, IoU, Dice coefficient and BF score. In the description of these evaluation metrics, we will use the following definitions: False Positives: pixels that belong to the background that were misclassified as belonging to lesions; False Negatives (FN): pixels that belong to lesions that were misclassified as belonging to the background; True Positive: pixels that belong to lesions that were correctly classified as belonging to lesions; True Negative (TN): pixels that belong to the background that were correctly classified as belonging to the background.

The global accuracy is the ratio between the pixels correctly classified, regardless of class, and the total number of pixels and is given

$$\text{global accuracy} = \frac{TP+TN}{TP+TN+FP+FN}$$

The accuracy gives the proportion of corrected classified pixels in each class and is given in

$$\text{accuracy} = \frac{(TP/TP+FN)+(TN/TN+FP)}{2}$$

The IoU is a metric that penalizes the incorrect classification of pixels as lesions (FP) or as background (FN), and is given

$$IoU = \frac{Lesion+Background}{2}$$
Where:

$$Lesion = \frac{TP}{TP+FN+FP}$$

$$Background = \frac{TN}{TN+FN+FP}$$

The Weighted IoU is used when there is a disproportionate relation between the class sizes in the images, minimizing the penalty of wrong classifications in smaller classes. It is given

$$Weighted\ IoU = Lesion\ weight\ x\ lesion + Background\ weight\ x\ background$$