1. Mean Absolute Error (MAE)

Formula:

$$\text{MAE} = \frac{1}{n}\sum_{i=1}^{n}|y_i - \hat{y}_i|$$

where:

- (n) is the number of data points,
- (y_i) is the actual value,
- (\hat{y}_i) is the predicted value.

Interpretation: MAE measures the average magnitude of the errors in a set of predictions, without considering their direction. It provides a straightforward measure of prediction accuracy in the same units as the data [1].

2. Relative Absolute Error (RAE)

Formula:

$$\text{RAE} = \frac{\sum_{i=1}^{n}|y_i - \hat{y}_i|}{\sum_{i=1}^{n}|y_i - \bar{y}|}$$

where:

- (\bar{y}) is the mean of the actual values.

Interpretation: RAE compares the total absolute error of your model to the total absolute error of a simple baseline model (e.g., predicting the mean). It provides a ratio that shows how well your model performs relative to this baseline [2].

3. Root Mean Square Error (RMSE)

Formula:

$$\text{RMSE} = \sqrt{\frac{1}{n}\sum_{i=1}^{n}(y_i - \hat{y}_i)^2}$$

Interpretation: RMSE measures the square root of the average squared differences between predicted and actual values. It provides a measure of the average magnitude of the errors in the same units as the original data, making it easier to interpret [3].

4. Relative Root Mean Square Error (RRMSE)

Formula:

$$\text{RRMSE} = \frac{\text{RMSE}}{\bar{y}} = \frac{\sqrt{\frac{1}{n}\sum_{i=1}^{n}(y_i - \hat{y}_i)^2}}{\bar{y}}$$

Interpretation: RRMSE normalizes the RMSE by the mean of the actual values, providing a relative measure of the prediction error. It is useful for comparing the performance of models across different datasets or scales [4].

5. Mean Absolute Percentage Error (MAPE)

Formula:

$$\text{MAPE} = \frac{1}{n}\sum_{i=1}^{n}\left|\frac{y_i - \hat{y}_i}{y_i}\right| \times 100$$

Interpretation: MAPE expresses the prediction error as a percentage of the actual values. It provides a clear percentage that indicates how large the errors are relative to the actual values. However, it can be sensitive to very small actual values [1].