Combining KNN Models:

Four Methods:

1.Average:

The average method is to take all the results from the different KNN models and average the results.

2.Maximum:

The maximum method is to get the maximum of the results from all KNN models.

3.Average of Maximum (AOM):

The AOM method is first to divide the **p** standardized anomaly scores from different KNN models. s1′(i), s2′(i), …, sp′(i) (i = 1, 2, …, n), into approximately p/q buckets, each containing q anomaly scores. Then, the maximum of the q anomaly scores in each bucket is determined. Finally, the ensemble anomaly score of unit cell i (i = 1, 2, …, n), is obtained by averaging the p/q maximum anomaly scores.

4.Maximum of Average (MOA):

The MOA method is similar to the AOM method. First, the p standardized anomaly scores from different KNN models s1′(i), s2′(i), …, sp′(i) (i = 1, 2, …, n), is divided into approximately p/q buckets, each containing q anomaly scores the average of each bucket is calculated, and the maximum of the p/q averaged anomaly scores is calculated. This result is used as the ensemble anomaly score of unit cell i (i = 1, 2, …, n).

The idea is to have two KNN models working together to arrive at a prediction thus leveraging the power of federated learning. The data values from 2 (or more) of the camera is combined together and is sent to a server where a global subset will be created. This global subset will be created by the global KNN model which will have the intersection of data points of both the data values. This global subset will be send to both of the cameras where a local KNN model will create a local subset. This local subset will be used to predict the class of the image. Point to be noted is that the K value of the global KNN model will be considerably greater than the K value used in the local KNN model.