Model Architecture/Parameters:

CNN:

* Each image input shape = (3,17,1); A 2D image with a 3rd dimension for specification of monochromatic or RGB color.
* 2 *Convolutional layer* both with 32 number of filter with filter shape being (1x3) and (2x2) respectively. “ReLU” activation function is used for both layers.
* 1 *max pooling* layer of (2x2) down sampling.
* 1 *dropout* layer with rate=0.2 to avoid overfitting.
* Flatten output to 1D array
* 1 fully connected *dense* layer with 256 nodes which is then followed with an “ReLU” activation layer
* 1 *dropout* layer with rate=0.2.
* Final *dense* layer with 1 node with “Sigmoid” activation function.
* Training:
  + Loss function = binary crossentropy
  + Optimizer = adam
  + Epochs = 40
  + Batch size = 200
  + Early Stopping Patience = 5

NearestNeighbour:

* *n\_neighbors*=30
* *n\_jobs*=-1

DecisionTree:

* *criterion*='entropy',
* *random\_state*=randomizer,
* *max\_depth*=10,
* *min\_samples\_leaf*=1,
* *min\_samples\_split*=2,
* *splitter*='best'

RandomForest:

* *max\_depth*=30,
* *n\_estimators*=30,
* *n\_jobs*=-1,
* *warm\_start*=False,
* *random\_state*=randomizer

XGBoost:

* *n\_estimators*=100,
* *colsample\_bytree*=0.8317,
* *learning\_rate*=0.1,
* *max\_depth*=20,
* *min\_child\_weight*=3.0,
* *subsample*=0.9099,
* *gamma*=0.292,
* *reg\_lambda*=0.447,
* *objective*='binary:logistic',
* *rate\_drop*=0.2,
* *silent*=True,

NeuralNet:

* *max\_iter*=1000,
* *shuffle*=True,
* *warm\_start*=False,
* *early\_stopping*=True,
* *validation\_fraction*=0.1,
* *random\_state*=randomizer,

AdaBoost:

* *n\_estimators*=200,
* *learning\_rate*=0.5,
* *random\_state*=randomizer