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