

This machine learning algorithm does a good job at predicting if the detected object is either a rock or a mine. The highest accuracy achieved was approximately 90% and this was done using 8 components from the data set. The number 8 was chosen as optimal by the principal component analysis because the rest of the data set just introduces noise that complicates the selection process unnecessarily. While 90% accuracy rate may not seem good enough when dealing with a mine field, the submariners can find some solace in the fact that there were 5 false positives (guessed a mine when it was a rock) and only one false negative (guessed a rock when it was a mine). This information is found in the confusion matrix when using the 8-component analysis and helps to make the sailors feel better because the algorithm is more on the cautious side when choosing between rocks or mines. The plot of accuracy vs number of components shows a sharp rise in accuracy from 1 to 8 components and then a gradual drifting down in accuracy as the other components introduce more complexity to the algorithm. The only MLP Classifier parameter that was changed to a different from the ones provided was the random state because it helped to ensure that any changes made to the other parameters were causing the changes in accuracy, not the random weight and bias generation.