This paper delves into handwritten digit recognition by using four structural features and applying the k-nearest neighbor (k-NN) classifier to classify the digits. Their model utilized the MNIST database using 5,000 test images and resulted in a 96.94% recognition rate. With a defined algorithm using the 50,000 training images and 5,000 testing images, the authors found the optimal number of k such that the accuracy is maximized, which was k=1.

The authors present an accuracy table of the percentages of recognition for 5000 total test images broken down to each digit and give the counts for correctly not classified and correctly classified. However, they do not give a typical confusion matrix which would show a false negative and positives, along with true negative and positive counts. By giving the actual and predicted counts within the divisions of classified data, then the readers are given further insight into the model's errors.

Should the authors present the confusion matrix, they could have expanded to present a receiver operating characteristic (ROC) curve and the area under the curve (AUC). Since the paper does not give the true/false positive rates, the readers are unable to know the relationships between sensitivity and specificity for every possible cut-off, or have the AUC to summarize the ROC. Overall, the article is well presented, though it could have gone more in-depth with presentation of accuracy of the model though.

Resources:

Babu, U.R., Venkateswarlu, Y. & Chintha, A.K. (2014). Handwritten digit recognition using k-nearest neighbour classifier. *2014 World Congress on Computing and Communication Technologies, 2014, pp. 60-65.* *http://doi.org/10.1109/WCCCT.2014.7*