Decision Tree Scikit-learn

The input to your model will be an image, and the output will be a classification of the number, from 0- 9. You’ll get a chance to work with common machine learning packages used in modern research. In addition, you will practice using the numerical computation package Numpy for preprocessing.

Report

• Model & Training Procedure Description For each classification algorithm, include sections describing the structure of your model. For example, for ANN include the number of layers, number of neurons in each layer, number of epochs used for training, and batch size used for training.

• Graph Include a graph showing how training accuracy and validation accuracy change over time. Graph epochs versus training set and validation set accuracy.

• Model Performance & Confusion Matrix For each algorithm, include a confusion matrix showing results of the model reported on the test set. The matrix should be a 10-by-10 grid showing which categories images were classified as. Use your confusion matrix to additionally report precision & recall for each of the 10 classes, as well as overall accuracy of your model.

• Visualization For each algorithm, include 3 visualizations of images that were misclassified by your model and any observations about why you think these images were misclassified. You will have to create or use a visualization program that takes a 28-by-28 matrix input and translate it into a black-and-white image.