TOPOLOGICAL DATA ANALYSIS

ASSIGNMENT 3

Write an interactive Python code that does classifies the MNIST hand written digits data set.

(1) Download and read the paper *A topological "reading" lesson: classification of MNIST using TDA* from arXiV:1910.08345v2.
(2) Your job is to more or less implement the paper, i.e., using various filtrations and vectorization train a model that classifies the test data set.
(3) Do include some analysis at the end, like, the confusion matrix, feature importance, benchmarking, comparison with reference classifier of your choice etc.
(4) Try and find the least number of filtrations needed to achieve more than 90% accuracy.
(5) **Bonus**: Rotate the image in the test data set by a fixed angle and then classify. Make changes to your model in order to achieve more than 80% accuracy.
(6) **Added Bonus**: Use your model on fashion MNIST data set to get more than 75% accuracy.

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