Homework

September 5, 2025

1 Objectives

By the end of this homework, you should have an understanding of the metric and techniques to test the algorithms used in machine learning and deep learning

2 Problem Statement

2.1 Stress Problem

1. Please install the transformer package and torchvision package.
2. Using the Adaboost code with perceptron (You can use the scratch version or the one in sklearn) you will implement using Stress data:
   (a) Use K-fold cross validation with K=5 to 10.
   (b) Please collect the data in each fold to get the average response and generate the necessary average metrics.
   (c) Report the average Confusion Matrix, ROC and Precision-Recall curves.
   (d) Report finally
      i. Precision
      ii. Recall
      iii. F1

   metrics.

2.2 Computer Vision and LLM problem

1. You have two scenarios:
   (a) Using the fast R-CNN generate measurements of IoU in a series of images (Some are provided for you but you can select more) so you can generate precision and recall metrics
   (b) Using the GPT-2 generate BERT precision and recall precision metrics (Also some are provided for you but you can select more).
2. Report those.