MALAVIYA NATIONAL INSTITUTE OF TECHNOLOGY JAIPUR
Department of Computer Science and Engineering

CSP610 Lab Elective

Note: Lab- I Time: 2 hrs Write the program in Python.

1. Consider a biometric matcher that generates similarity scores in the range $[0, 1]$. Its genuine and impostor score distributions are as follows: $p(s|genuine) = 4 + 4s^2$ and $p(s|impostor) = 4 - 4s^2$. Suppose the following decision rule is employed: s is classified as a genuine score. If $s \geq \eta$; else it is classified as an impostor score. Here, $\eta \in [0, 1]$.

2. Plot the genuine and impostor distributions in a single graph.

3. Write a program to compute the DET and ROC curves based on these two distributions. Plot the DET and ROC curves.

4. Consider a theoretical biometric matcher that generates distance scores in the range $[-\infty, +\infty]$. Assume that the genuine and impostor score distributions due to this matcher can be approximately modeled as $N(20, 5)$ and $N(60, 15)$, respectively. Here, $N(\mu, \sigma^2)$ denotes a normal distribution with mean, μ, and variance, σ^2. Suppose the following decision rule is employed: s is classified as a genuine score if $s \leq \eta$; else it is classified as an impostor score. Here, $\eta \in [0, 100]$.

5. Plot the genuine and impostor distributions in a single graph. The distributions should be contained in the range $[0, 100]$.

6. Write a program to compute the DET and ROC curves based on these two distributions. Plot the DET and ROC curves.

ROC=tpr vs fpr

tpr=tp/(tp+fn)

fpr=fp/(tn+fp)