Assignment 1
Performance Evaluation

CMPE58Z Introduction to Biometrics **Due: April 26th, 2021, 6am**

In this assignment, you are asked to analyze the verification performance of a biometric system. Assume that a biometric matching algorithm produces a similarity matrix (SM) that contains similarity (or dissimilarity) scores. Class label information (person identities) is also provided to you to find out which matrix entries in the SM are genuine and impostor scores. Given an SM and its corresponding class labels, you are asked to:

a) Compute Equal Error Rate (EER) and EER threshold. In addition to the EER, provide FRR values at the following FAR points: FAR=10%, FAR=1%, FAR=0.1%
b) Plot genuine and impostor score distributions
c) Plot ROC curve

Your program should output EER/FAR/FRR values and plots the required curves. Following inputs to the program are provided to you as text files:

a) Similarity matrix.
b) Class labels of every sample in the similarity matrix.

Report Contents

The report should contain the following items:

a) A table containing the Equal Error Rate, EER threshold, and required FAR & FRR values.
b) Plot of genuine and impostor score distributions.
c) ROC curve.
d) Brief explanation of how you computed the EER point.

You will be given multiple similarity matrix/class label pairs. Provide outputs for all these inputs. A sample report can be found at the end of this document.

Note for Other Programming Languages

You are free to use other programming languages. Your program should read input files and produce required outputs (EER, FAR/FRR values, and ROC curve) automatically.

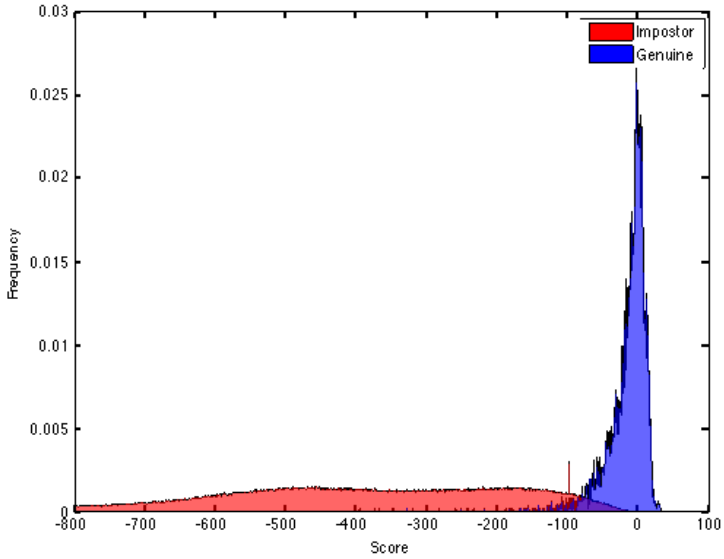
Sample Report Contents

Results shown below are for a single SM/class label pair.

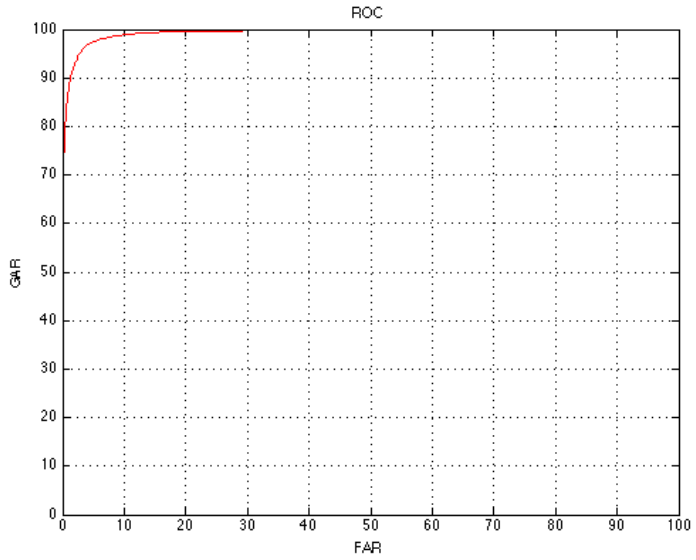
1. EER, EER Threshold, and FAR/FRR values at required operating points

EER	5.65%	EER Threshold	-29.1
FRR	43.87%	at FAR point	0.1%
FRR	25.34%	at FAR point	1%
FRR	6.76%	at FAR point	10%

2. Genuine and Impostor Score Distribution Plot



3. ROC Curve



4. Explanation of EER Computation Method

Evaluation Criteria

		Points
Performance evaluation		50
Report (Completeness, correctness, format, language, etc.)		40
Compliance to Submission Rules (Directory structure, file formats/naming, organization, etc.)		10
	TOTAL	**100**

Submission Guide

Submission Files
Submit a single compressed (.zip) file, named as name_surname.zip, to Moodle.
Submission file should contain all source codes/data files (under the \code directory), report (in PDF format, under the \report directory) and all other files if needed (under \misc directory)

File Naming
Name your report as name_surname.pdf.
Name the main code which is used to start/run your assignment as assignmentX.py, where X is the assignment number.

Late Submission Policy
Maximum late submission period is two days.
Late submission is graded on a scale of 50% of the original grade.

Mandatory Submission
Submission of assignments is mandatory.
If you do not submit an assignment, you fail the course.

Plagiarism
Leads to grade F and YÖK regulations will be applied