Assignment 1: Dealing with scores

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In this assignment you are going to compute the following performance characteristics from a given score matrix:

1. False match rate as a function of decision threshold
2. False non-match rate a function of decision threshold
3. Decision error trade-off curve (DET)
4. Receiver operating characteristic (ROC)
5. The equal error rate (EER)

Step 1 Study the concepts mentioned above.

Step 2 Unzip the file 'DataAssignment1.zip'

Step 3 Open MatLab and run 'get_scores_from_file'. Now you have scores in a matrix 'S' and the identities of the entries of the matrix are in vector 'Id'. The classifier that has been used can be considered a symmetrical one. That means that *score(x,y) = score(y,x)*

Step 4 Write a function that extracts the genuine and impostor scores from the matrix and plot these in histograms defined on the same bins and in the same graph. (Use 'hist' in MatLab). What is an appropriate bin size? Keep in mind that genuine scores resulting from comparing a biometric sample with itself should not be included and that because of the symmetry of this score matrix only the strict lower (or upper) triangular submatrix contains useful information.

Step 5 Write functions that compute the required characteristics and produce plots for characteristics 1—4, and 6. Plot 1 and 2 in one graph.

Step 6 Play with the axis of DET and ROC (logarithmic FMR axis, logarithmic FNMR, logarithmic GMR axis, all axis logarithmic). Comment on the usefulness of these representations.