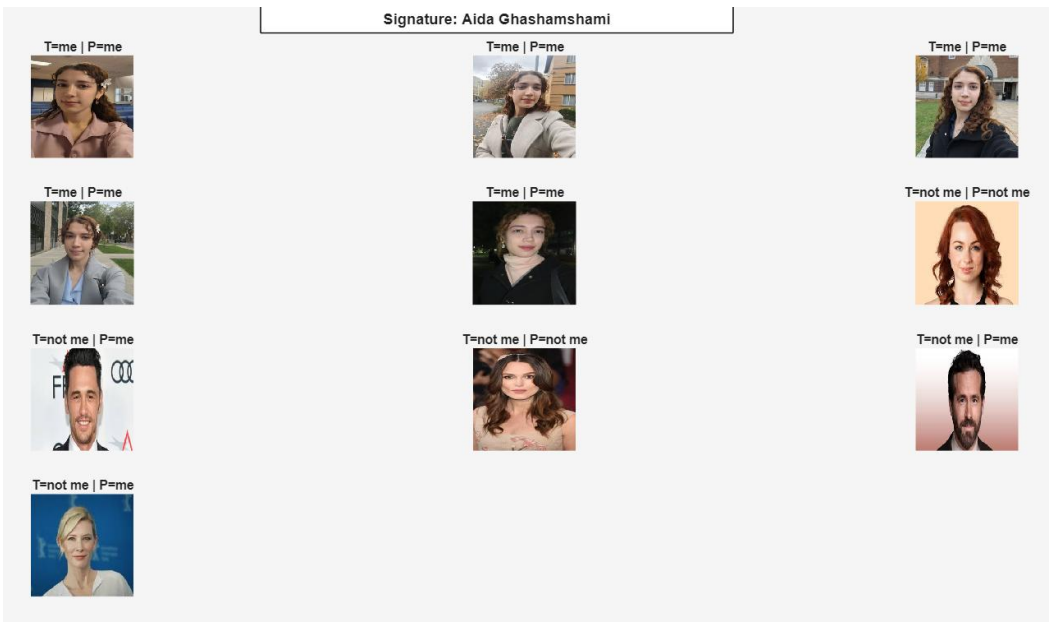
1. Similarity Metrics: In this section, each image is compared to a reference image using similarity measures: **SSIM, MSE, PSNR, Chi-square, and Histogram Intersection**. All comparisons are done on **grayscale images** to remove the effect of colour and focus only on facial structure and intensity patterns. The results ***generally*** show that images of ***me*** have **higher PSNR and SSIM and lower MSE** when compared to the reference.

2. Deep Learning with Confusion Matrix: A convolutional neural network is trained to classify images into **me** and **not me** classes. The dataset is split into training, validation, and test sets in a fixed and reproducible way.
The **confusion matrices** clearly show how many images are correctly and incorrectly classified. Validation Confusion Matrix shows 90% accuracy, and the Test Confusion Matrix shows 70% accuracy, as the figure suggests 7 out of 10 photos were classified correctly.

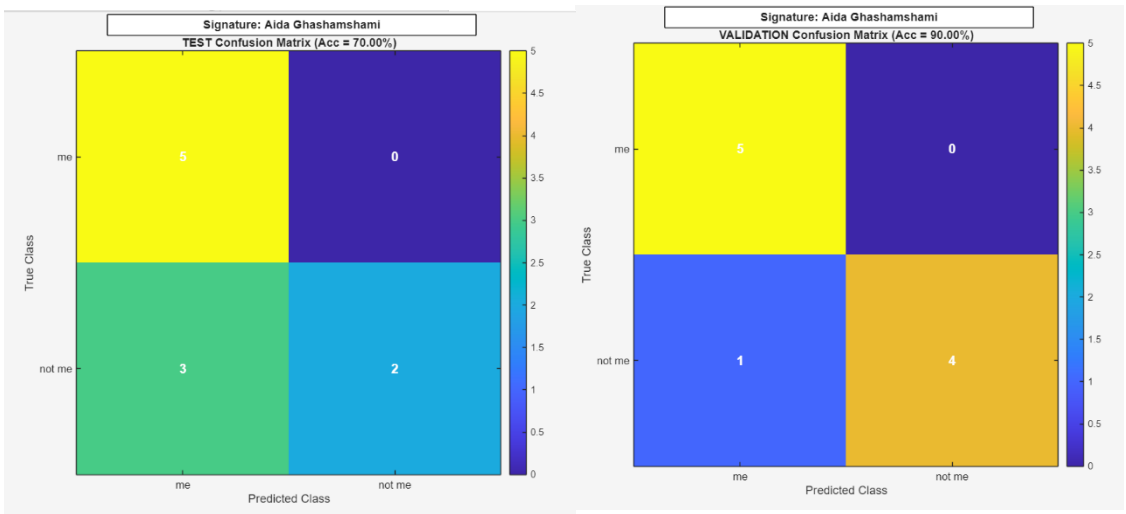
3. Segmentation and PSNR Comparison: Four segmentation methods, **HSV, Otsu, K-Means, and SVM** are applied. These methods separate the face from the background in different ways. Similarity is then measured using **PSNR computed on grayscale segmented outputs**, while the displayed images remain in colour. The results show that segmented images of the same person still achieve **higher similarity scores** than segmented images of other people.

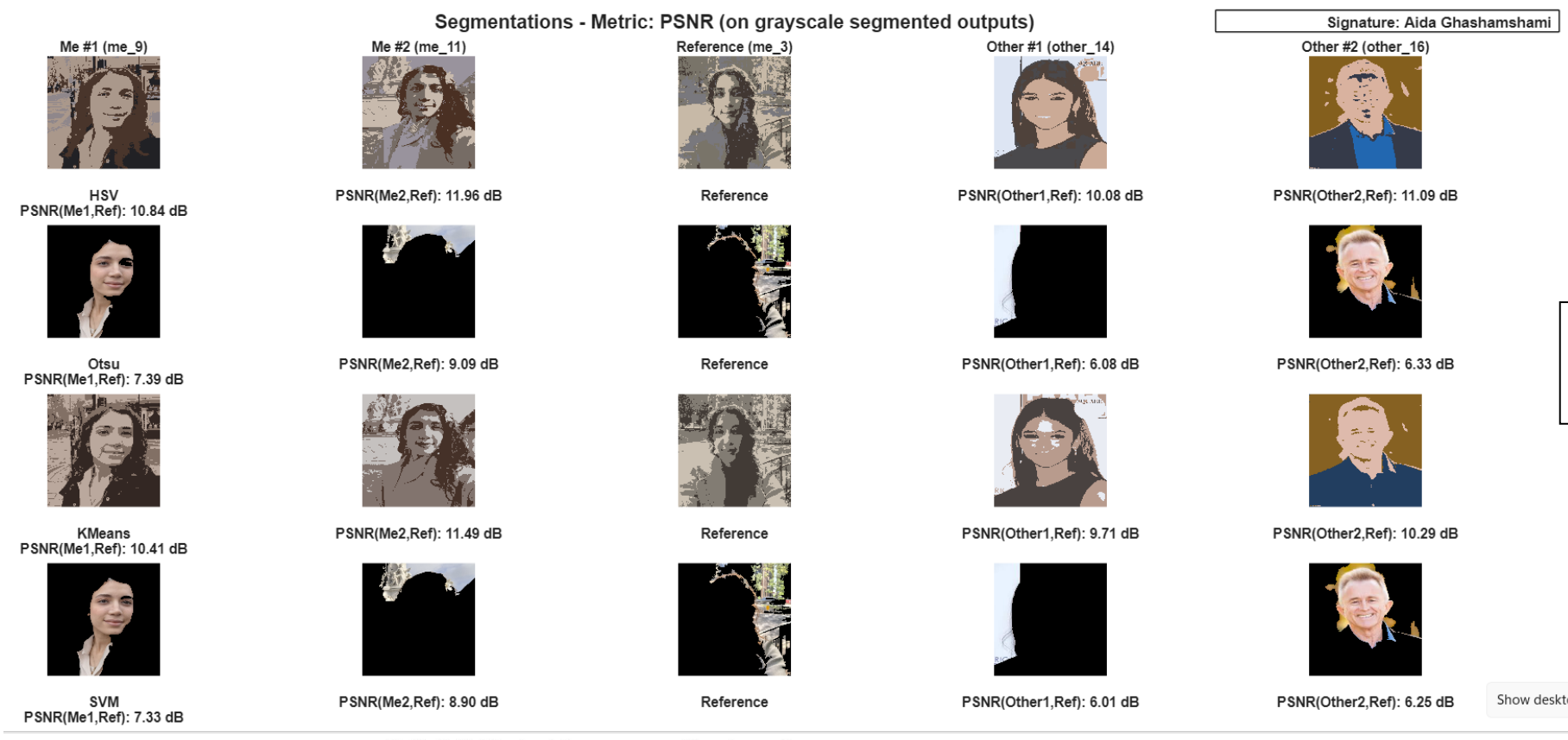
How to Run the Code: Unzip and open the file, then please run the **main.m** file (It sits inside the zipped file with the whole image database). It executes the **Deep Learning classifier**, **similarity analysis**, and **segmentation comparison**, and automatically displays all result figures with signatures included.

Below are outputs of MATLAB, featuring Deep Learning and Confusion Matrices, Similarity Metrics and Segmentation.



Deep Learning + Validation and Test Confusion Matrices





Segmentation

Metric: PSNR

Similarity Metrics:

SSIM

MSE

Chi-Square

Histogram Intersection

PSNR

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