





## Gabrielle E. Dela Cruz | CPE32S3





To test the functionality of face recognition with the use of three models, a dataset consisting of 10 images of Friend1 (me) and Friend2 (mother) is used. The performance of the face recognition test is determined by the capabilities of each implemented model, namely: Eigenface, Fisherface, and Local Binary Pattern Histograms (LBPH); however, it must be noted that constraints, such as the image quality captured by the camera, may produce different effects. The Expected Output corresponds to the person at the test, and the Actual Output may depend on the person at the camera. In the differentiation of the real-time performances, additions to variety such as covering by hand gestures or wearing accessories were tested.

### Eigenface Recognition:






Image	Expected Output/s	Actual Output/s	Match/Mismatch/Unrecognized
	Friend 1	Friend 1	Matched
	Friend 1	Friend 1	Matched
	Friend 1	Friend 1	Matched
	Friend 1	Friend 1	Matched

	Friend 1	Friend 1	Matched
	Friend 1	None	Unrecognized
	Friend 1	Friend 1	Matched
	Friend 2	Friend 1	Mismatched
	Friend 1, Friend 2	Friend 2	Matched, Unrecognized
	Friend 1, Friend 2	Friend 2	Matched, Unrecognized

	Friend 1, Friend 2	Friend 2	Matched, Unrecognized
	Friend 2	Friend 1	Mismatched
	Friend 1, Friend 2	Friend 2	Matched
	Friend 1, Friend 2	Friend 2	Matched
	Friend 1, Friend 2	Friend 1, Friend 2	Matched
	Friend 1, Friend 2	Friend 1, Friend 2	Matched



	Friend 1, Friend 2	Friend 1, Friend 1	Matched and Mismatched
	Friend 1, Friend 2	Friend 1, Friend 2	Matched
	Friend 1, Friend 2	Friend 1, Friend 1	Matched and Mismatched
	Friend 1, Friend 2	Friend 1, Friend 2	Matched

## Fisherface Recognition

Image	Expected Output/s	Actual Output/s	Match/Mismatch/Unrecognized
	Friend 1	Friend 1	Matched
	Friend 1	Friend 1	Matched
	Friend 1	Friend 1	Matched
	Friend 1	Friend 1	Matched
	Friend 1	Friend 1	Matched



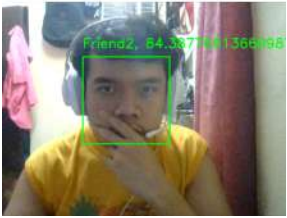


	Friend 1	Friend 1	Matched
	Friend 1	Friend 1	Matched
	Friend 2	Friend 2	Matched
	Friend 2	Friend 2	Matched
	Friend 2	Friend 2	Matched
	Friend 2	Friend 2	Matched






	Friend 2	Friend 2	Matched
	Friend 2	Friend 2	Matched
	Friend 1, Friend 2	Friend 1, Friend 2	Matched
	Friend 1, Friend 2	Friend 1, Friend 2	Matched
	Friend 1, Friend 2	Friend 1, Friend 2	Matched
	Friend 1, Friend 2	Friend 1, Friend 2	Matched




	Friend 1, Friend 2	Friend 1	Matched, Unrecognized
	Friend 1, Friend 2	Friend 1, Friend 2	Matched






## Local Binary Pattern Histograms (LBPH) Recognition

Image	Expected Output/s	Actual Output/s	Match/Mismatch/Unrecognized
	Friend 1	Friend 2	Mismatched
	Friend 1	Friend 2	Mismatched
	Friend 1	Friend 2	Mismatched
	Friend 1	Friend 2	Mismatched
	Friend 1	Friend 1	Matched

	Friend 1	Friend 1	Matched
	Friend 2	Friend 2	Matched
	Friend 2	Friend 2	Matched
	Friend 2	Friend 2	Matched
	Friend 2	None	Unrecognized
	Friend 2	Friend 2	Matched

	Friend 2	Friend 2	Matched
	Friend 2	Friend 2	Matched
	Friend 1, Friend 2	None	Unrecognized
	Friend 1, Friend 2	Mismatched, Unrecognized	Mismatched, Unrecognized
	Friend 1, Friend 2	Mismatched, Unrecognized	Mismatched, Unrecognized
	Friend 1, Friend 2	Mismatched, Friend 2	Mismatched and Matched

	Friend 1, Friend 2	Mismatched, Friend 2	Mismatched and Matched
	Friend 1, Friend 2	Mismatched, Friend 2	Mismatched and Matched
	Friend 1, Friend 2	Unrecognized, Mismatched	Unrecognized, Mismatched

In this project, a dataset containing the image data of two individuals, each with a set of 10 faces in different angles, was used to perform on the three face recognition models. In this dataset, the Eigenface Recognition was observed that it optimally performs in face detection but falls short compared to Fisherface and LBPH. Despite this, it performs better in recognition compared to LPBH. The distance to which it detects faces and sensitivity to light is similar to LPBH. The LPBH performs best in detection even in closer proximity compared to the other models but its recognition fails the most. It has been observed in Fisherface to perform the best in face recognition with a balanced detection, in offering short and long distances, paired with the ability to be less sensitive with light. Additionally, the Fisherface model is able to detect with hand gestures that may cover the face, demonstrating its better capability of detecting. Finally, it can be deduced that the Fisherface model works the best at least in this dataset, where it is able to detect and recognize most imaging scenarios.