

# 3D Face Verification Report

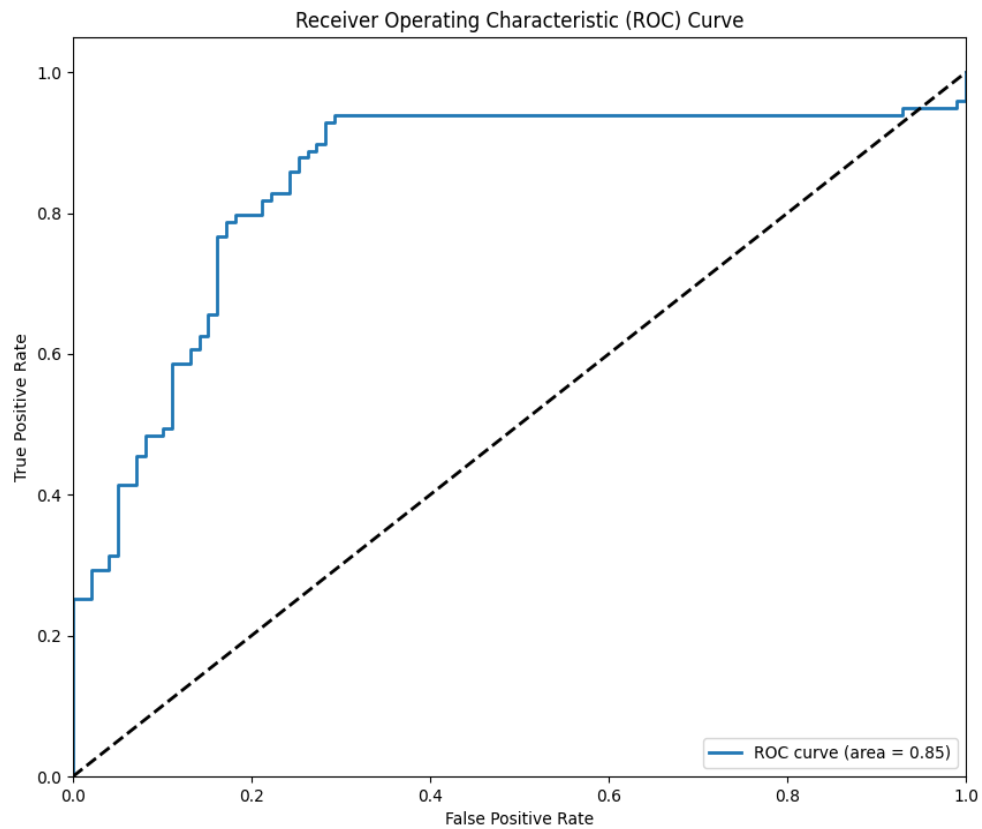
## 1. Summary

### Verification Metrics

| Metric                         | Value  |
|--------------------------------|--------|
| Best Accuracy Threshold        | 0.6566 |
| Accuracy at Best Threshold     | 0.8535 |
| Precision                      | 0.8017 |
| Recall                         | 0.9394 |
| F1 Score                       | 0.8651 |
| False Accept Rate (FAR)        | 0.2323 |
| False Reject Rate (FRR)        | 0.0606 |
| Equal Error Rate (EER)         | 0.2071 |
| EER Threshold                  | 0.7172 |
| ROC AUC                        | 0.8478 |
| Total Same-Identity Pairs      | 99     |
| Total Different-Identity Pairs | 99     |

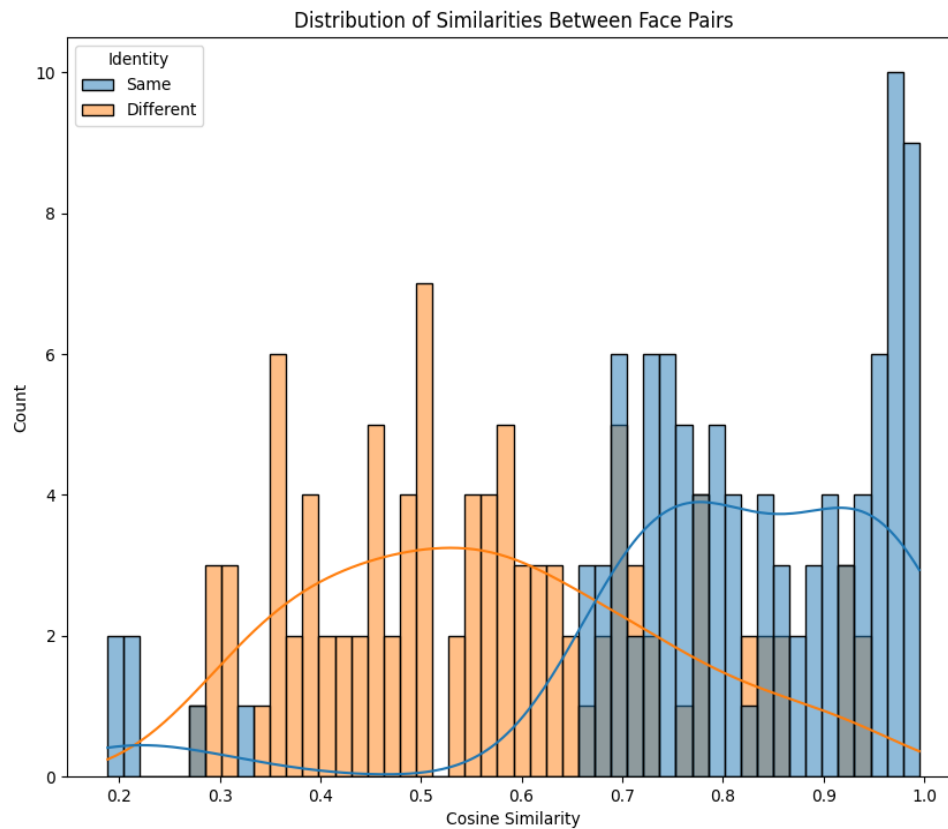
## 2. ROC Curve

The Receiver Operating Characteristic (ROC) curve shows the trade-off between true positive rate and false positive rate at different thresholds.



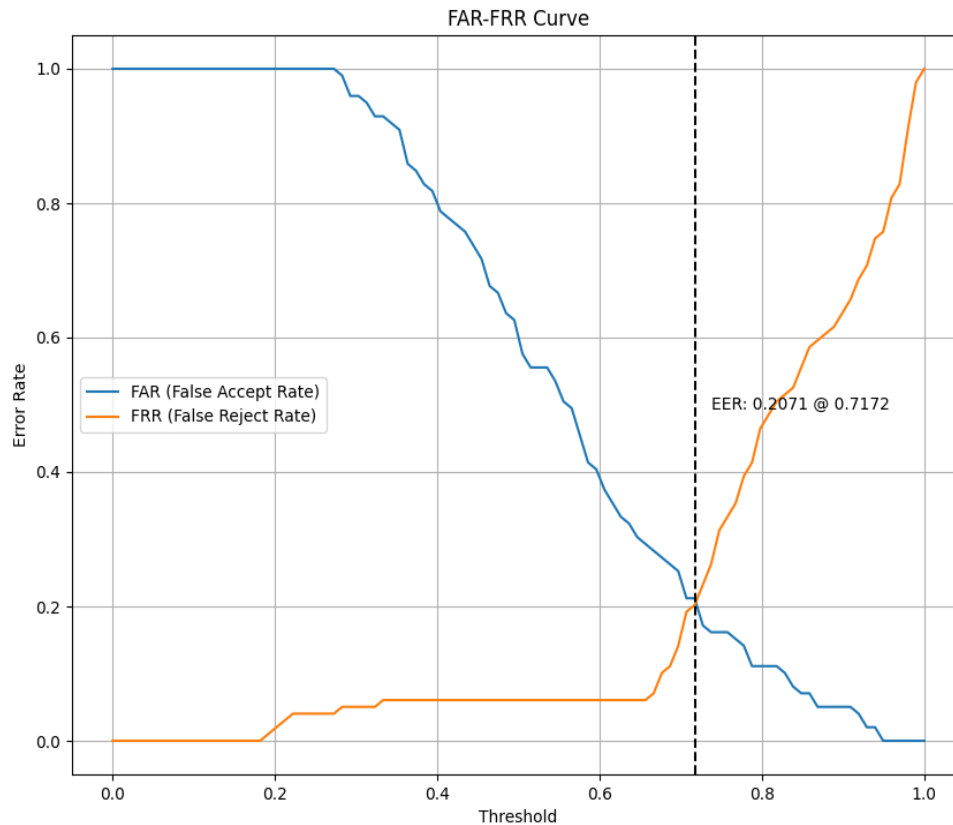
### 3. Similarity Distribution

The distribution of cosine similarities between same-identity and different-identity face pairs:



## 4. FAR-FRR Curve

The False Accept Rate (FAR) and False Reject Rate (FRR) at different thresholds. The Equal Error Rate (EER) is the point where FAR equals FRR.



## 5. Conclusions and Recommendations

The 3D face verification system achieves an Equal Error Rate (EER) of 0.2071, which needs improvement. For optimal accuracy, a similarity threshold of 0.6566 is recommended, which yields: - Accuracy: 0.8535 - Precision: 0.8017 - Recall: 0.9394 The ROC AUC of 0.8478 indicates acceptable discriminative power.

Recommendations for improvement: 1. If the EER is above 0.1, consider: - Collecting more training data - Improving the quality of 3D face scans - Increasing the embedding dimensionality 2. If the similarity distributions have significant overlap: - Try increasing the margin in the loss function - Explore different feature extraction architectures 3. For production deployment: - Choose a threshold based on the specific security requirements - For high security, use a higher threshold (lower FAR, higher FRR) - For convenience, use a lower threshold (higher FAR, lower FRR)