

■ PRIVACY-PRESERVING BIOMETRIC AUTHENTICATION

Explainable AI (XAI) Decision Report

Report Generated:	2026-03-01 11:23:58 IST
Query User ID:	24
Number of Features:	2
Rule:	≥ 1 feature ≥ 0.99 in ≥ 2 templates
System:	Fully Homomorphic Encryption (FHE) Authentication
XAI Method:	Rule-Based Feature Attribution & Confidence Assessment

1. QUICK ANALYSIS

User: 24

Best Score (Average): 0.9948

Average Threshold: 0.7

Templates with High Features (≥ 0.99): 4/10

Required Templates: 2

Rule-Based Result: AUTHENTICATED ■

Methods Agree: ■

Action: GRANT_FULL_ACCESS

Reason: Both methods confirm identity (4/2 templates meet rule)

2. DETAILED TEMPLATE ANALYSIS

Template	Avg Score	Has High Feature	High Features	Max Feature
1	0.9773	■	0	0.9854
2	0.9717	■	0	0.9824
3	0.9948	■	1	1.0000
4	0.9948	■	1	1.0000
5	0.8836	■	0	0.9073
6	0.9865	■	1	0.9926
7	0.9580	■	0	0.9748
8	0.9903	■	1	0.9931
9	0.4566	■	0	0.4986
10	0.9785	■	0	0.9850

3. RULE-BASED AUTHENTICATION ANALYSIS

Rule: At least one feature ≥ 0.99 in at least 2 templates

Templates meeting rule: 4/10

Result: SUCCESS ■

Templates with high-confidence features:

- Template 3: 1 high feature(s) - Max: 1.0000
- Template 4: 1 high feature(s) - Max: 1.0000
- Template 6: 1 high feature(s) - Max: 0.9926
- Template 8: 1 high feature(s) - Max: 0.9931

■■ Near misses detected:

- Template 1: best feature = 0.9854 (needs 0.0046 more)
- Template 2: best feature = 0.9824 (needs 0.0076 more)
- Template 3: best feature = 1.0000 (needs -0.0100 more)
- Template 4: best feature = 1.0000 (needs -0.0100 more)
- Template 6: best feature = 0.9926 (needs -0.0026 more)
- Template 7: best feature = 0.9748 (needs 0.0152 more)
- Template 8: best feature = 0.9931 (needs -0.0031 more)
- Template 10: best feature = 0.9850 (needs 0.0050 more)

5. FEATURE-LEVEL ANALYSIS

Feature	Score	Status
Feature 1	1.0000	HIGH CONFIDENCE ■
Feature 2	0.9897	STRONG ✓

Feature Summary:

- High confidence features (≥ 0.99): 1
- Strong features (≥ 0.7): 2
- Moderate features (0.5-0.7): 0
- Weak features (<0.5): 0

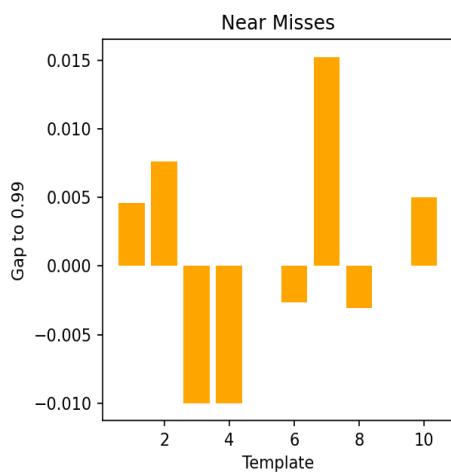
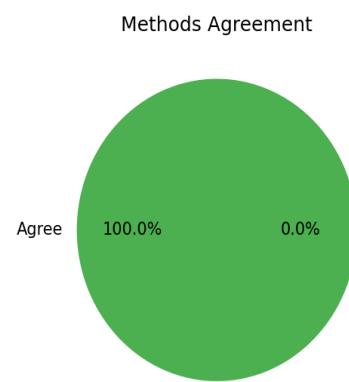
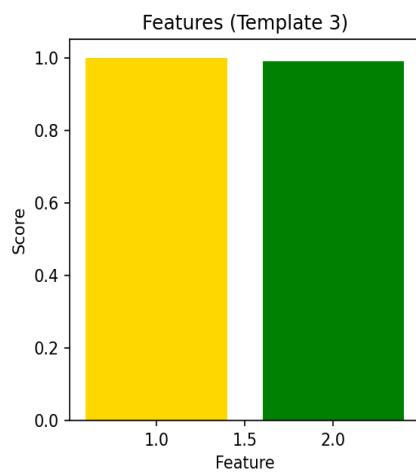
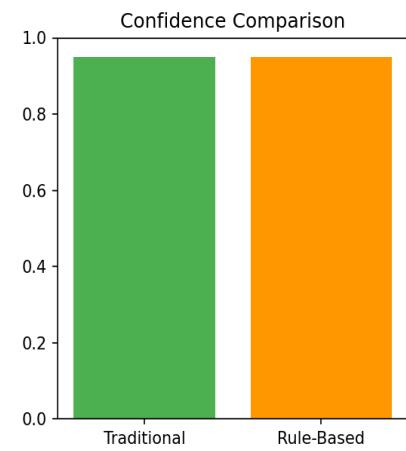
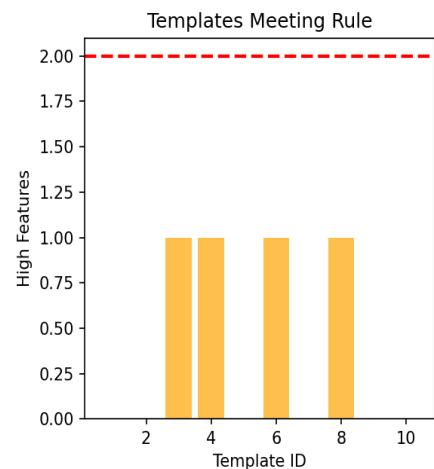
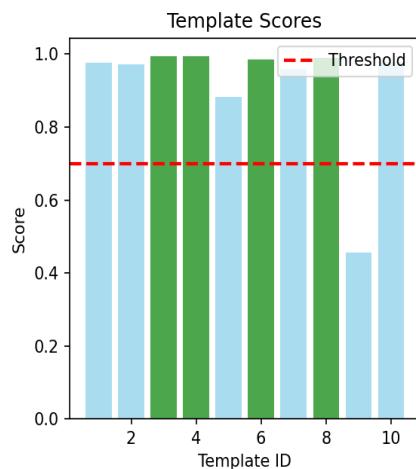
6. CONFIDENCE ASSESSMENT & RECOMMENDATIONS

Rule-Based Confidence: VERY_HIGH**Methods Agree:** ■ Yes**Recommended Action:** GRANT_FULL_ACCESS**Reason:** Both methods confirm identity (4/2 templates meet rule)

7. SECURITY INDICATORS

High Confidence Templates: 4**Total High Features Detected:** 4**Near Misses Detected:** ■■ Yes**Templates Shortfall:** 0

8. VISUAL ANALYSIS



9. STRUCTURED DATA (JSON)

```
{  
  "query_user_id": "24",  
  "configuration": {  
    "num_features": 2,  
    "feature_threshold": 0.99,  
    "min_templates_required": 2,  
    "average_threshold": 0.7  
  },  
  "authentication_rules": {  
    "rule_based": {  
      "enabled": true,  
      "templates_meeting_rule": 4,  
      "success": true,  
      "templates_detail": [  
        {  
          "template": 3,  
          "high_features": [  
            1.0  
          ],  
          "count": 1,  
          "max_feature": 1.0,  
          "avg_score": 0.9948302791735171  
        },  
        {  
          "template": 4,  
          "high_features": [  
            1.0  
          ],  
          "count": 1,  
          "max_feature": 1.0,  
          "avg_score": 0.9948302673407257  
        },  
        {  
          "template": 6,  
          "high_features": [  
            0.9926278856214514  
          ],  
          "count": 1,  
          "max_feature": 0.9926278856214514,  
          "avg_score": 0.9864594401704644  
        },  
        {  
          "template": 8,  
          "high_features": [  
            0.9930850195745448  
          ],  
          "count": 1,  
          "max_feature": 0.9930850195745448,  
          "avg_score": 0.9903401943081769  
        }  
      ]...  
    }  
  }  
}
```