

## NAVY ACCESS CONTROL SYSTEM – PROJECT CONVERSATION GUIDE

OVERVIEW Complete design, debugging journey, and final architecture for a Navy-style Facial Recognition Access Control System demo using Python, OpenCV, face\_recognition, MediaPipe, and Tkinter on Linux Mint.

SYSTEM FLOW 1. Card Scan (ONO/PNO) 2. Local photo lookup 3. Camera auto start 4. Liveness detection (Blink + Head Turn) 5. Face verification 6. ACCESS GRANTED / DENIED 7. Audit log saved

CRITICAL FIXES - Removed cv2.imshow() to avoid Tkinter freeze - Embedded camera preview inside dashboard - Non-blocking state-machine architecture - Fixed Tkinter background crash - Logs.csv backward compatibility

FOLDER STRUCTURE navy\_access\_demo/ - app4.py - assets/navy\_bg.jpg - photos/ - logs.csv

DEPENDENCIES pip install opencv-python face-recognition mediapipe pillow numpy

FUTURE UPGRADES - Randomized liveness - Multi-photo per ONO - Alarm + door relay - Encrypted embeddings - Fullscreen kiosk

DISCLAIMER Demo system only. Not for real military deployment.