

# FRIDAY THE AI HELMET

AN AI-POWERED SMART HUD ASSISTANT



# **REAL-TIME OBJECT DETECTION, VELOCITY ESTIMATION, AND VOICE- ACTIVATED SAFETY PROTOCOLS**



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01.

## The Problem

Traditional helmets offer physical protection but lack situational awareness and hands-free communication for riders

02.

## The Vision

An Iron Man-inspired "Friday" AI that assists the rider via vision and voice

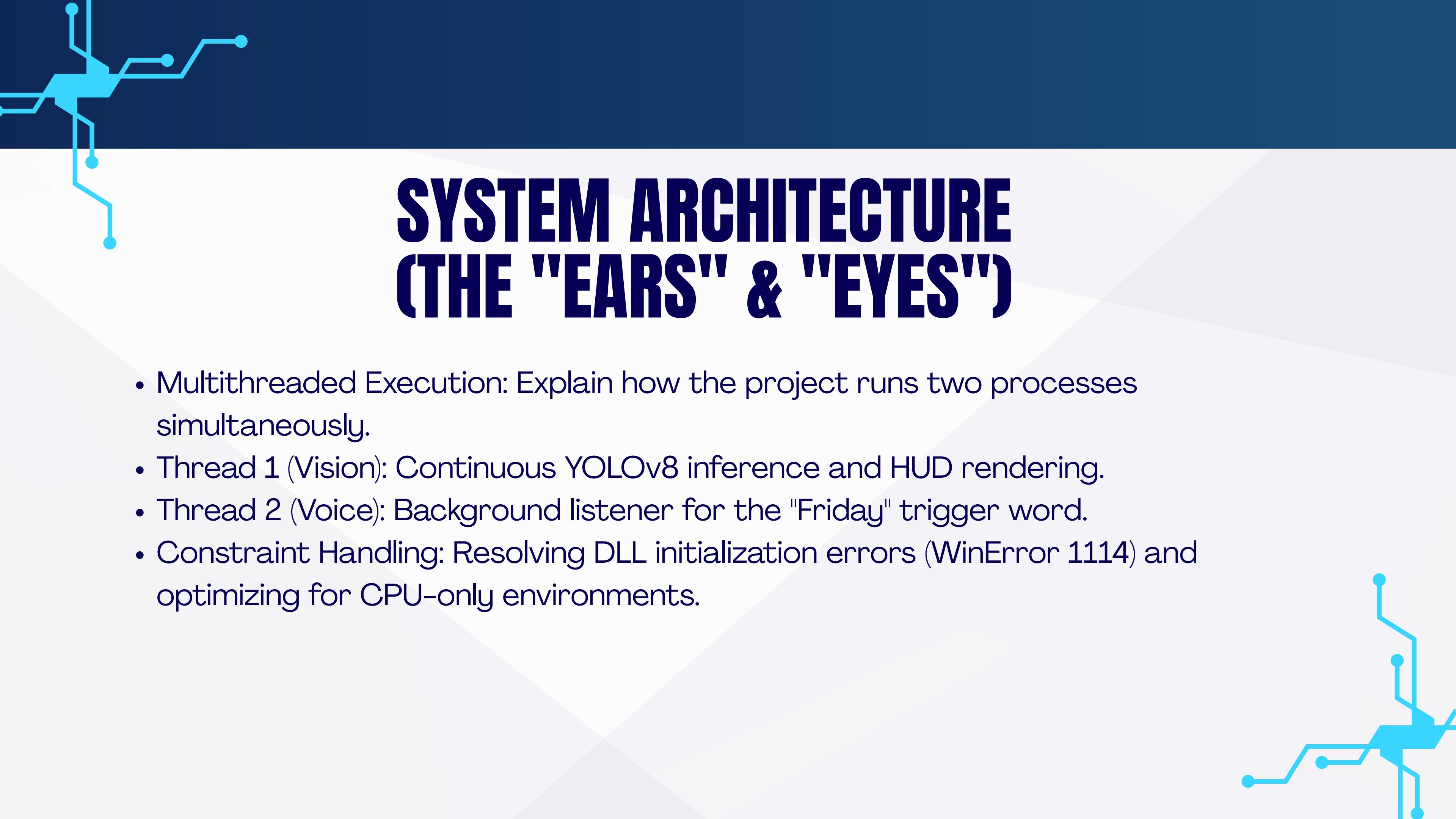
03.

## Core Objectives

- Iron Man-style HUD Visualization.
- AI-based Vehicle Classification & Tracking.
- Hands-free Emergency (SOS) System.
- Automated Trip Telemetry Logging.

# TECHNICAL STACK

- Language: Python 3.12.
- Computer Vision: YOLOv8 (Ultralytics) and OpenCV.
- Voice Interface: Speech Recognition and Pyttsx3.
- Data Persistence: Qr code and Threading.
- Platform: Windows-optimized prototype.



# SYSTEM ARCHITECTURE (THE "EARS" & "EYES")

- Multithreaded Execution: Explain how the project runs two processes simultaneously.
- Thread 1 (Vision): Continuous YOLOv8 inference and HUD rendering.
- Thread 2 (Voice): Background listener for the "Friday" trigger word.
- Constraint Handling: Resolving DLL initialization errors (WinError 1114) and optimizing for CPU-only environments.

# FEATURE SPOTLIGHT – AI VISION & SPEED TRACKING

- **Object Tracking:** Using a custom tracker to identify unique vehicle IDs.
- **Speed Logic:** Explain the pixel-displacement formula:  $\text{Speed} = (\text{distance} / \text{time}) \times \text{Scale Factor}$ .
- **Dynamic HUD:** Real-time labeling of "TARGET: CAR" or "BIKE" with calculated velocity.



# THE "KILLER" FEATURE – VOICE SOS & EMERGENCY

- **Hands-Free Safety:** Designed for scenarios where the rider cannot use their hands.
- **Voice Trigger:** Responds to commands like "Friday, emergency".
- **SOS Logic:** Simulates alerting police/ambulance and sending coordinates.

# DATA INTEGRITY & QR REPORTING

- Post-Ride Analysis: Automatic generation of driving\_details\_qr.png.
- Encoded Data: Logs trip date, maximum speed recorded, and system status.
- Professional Output: Demonstrates the ability to bridge AI output with usable data formats.



# FUTURE ROADMAP & CONCLUSION

- **Hardware Integration:** Transitioning from laptop webcam to ESP32-Cam or Raspberry Pi.
- **Enhanced Safety:** Integrating live GPS and Night Vision modes.
- **Summary:** Friday\_Helmet proves that AI can be a proactive safety partner, not just a reactive tool.

# THANK YOU.

