

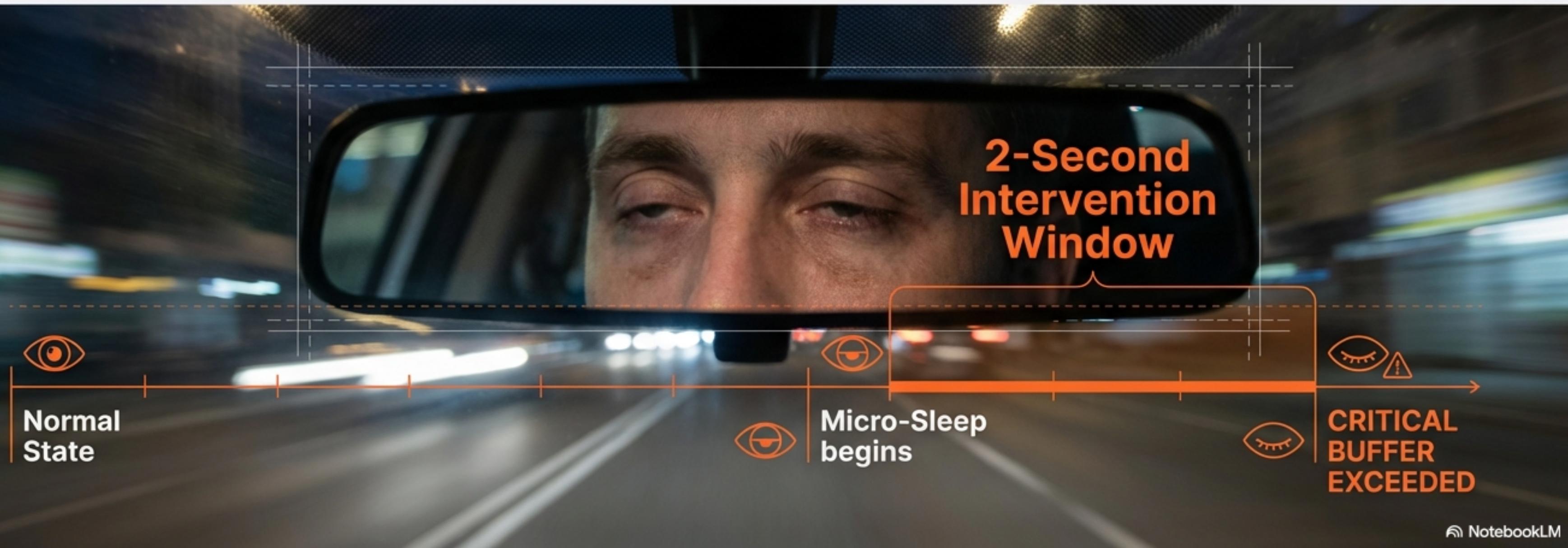


Kavach AI: The Digital Guardian for Road Safety

Moving beyond passive
warnings to active
intervention and
culturally aware protection.

The Silent Killer: Driver Fatigue

Drowsiness doesn't announce itself. It happens in the blink of an eye. Road safety statistics indicate that a significant percentage of fatal accidents are caused by drivers falling asleep. The critical window for intervention is measured in milliseconds.



The Preventable Tragedy: Neglected Seatbelts

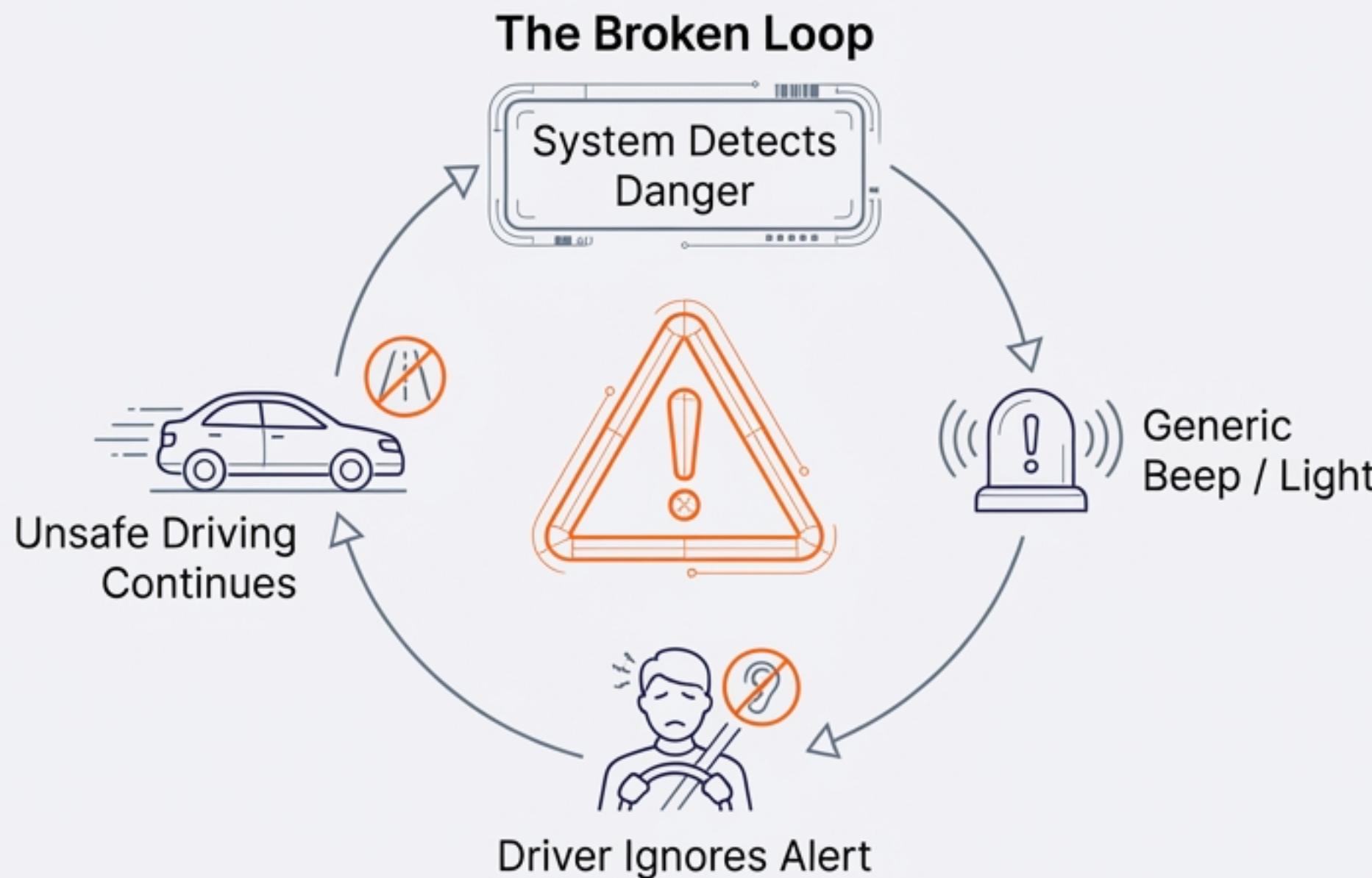
Despite regulations, seatbelt non-compliance remains a primary cause of fatality in otherwise survivable crashes. Drivers often forget, ignore, or actively bypass passive alarms.



**"A beep can be ignored. A warning light can be covered.
We need a system that cannot be bypassed."**

Why Traditional Alerts Fail

Current safety systems rely on Passive Observation.

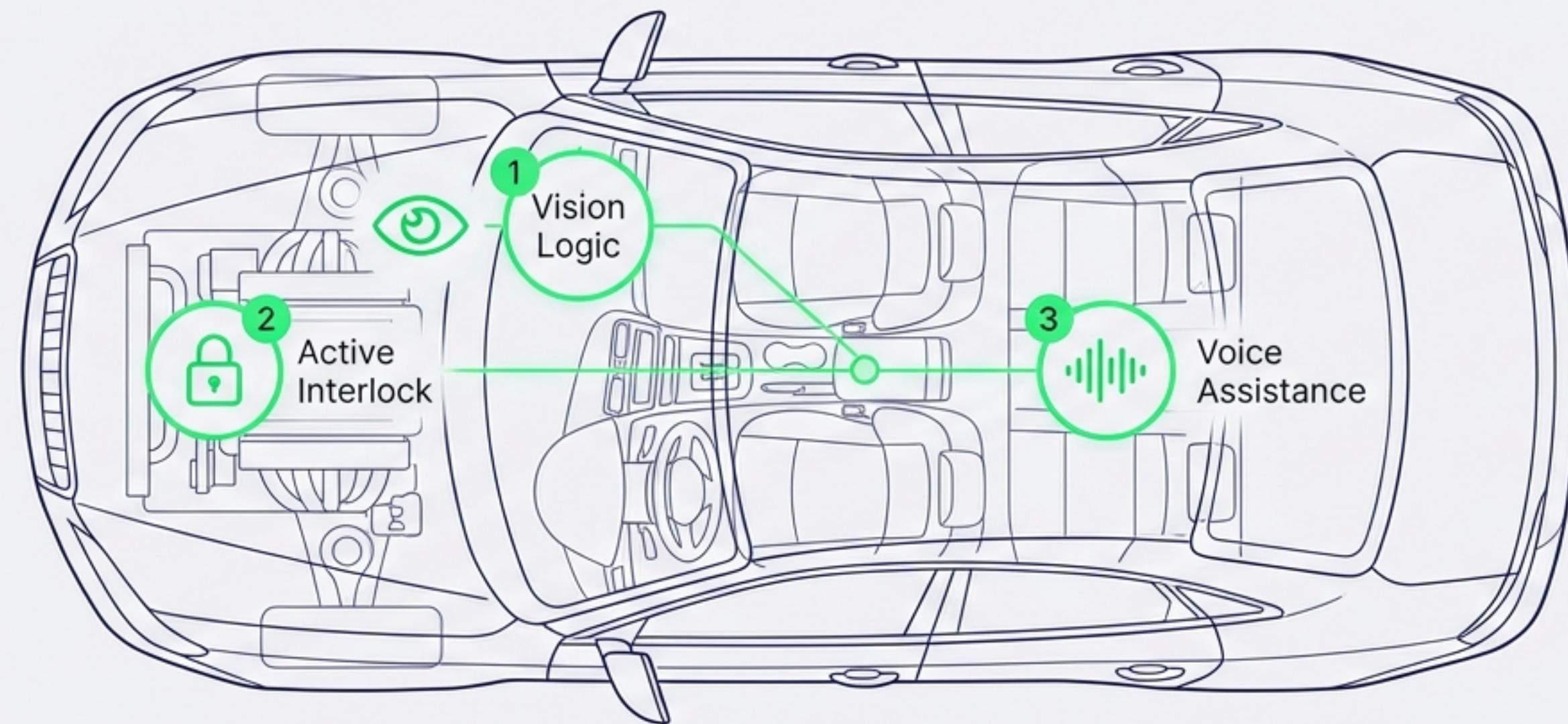


- ⊗ **Alert Fatigue:** Constant beeping becomes background noise.
- ⊗ **Language Barrier:** Generic signals fail to connect with rural drivers.
- ⊗ **No Consequence:** The car operates normally despite the risk.

We built Kavach AI to close this loop.

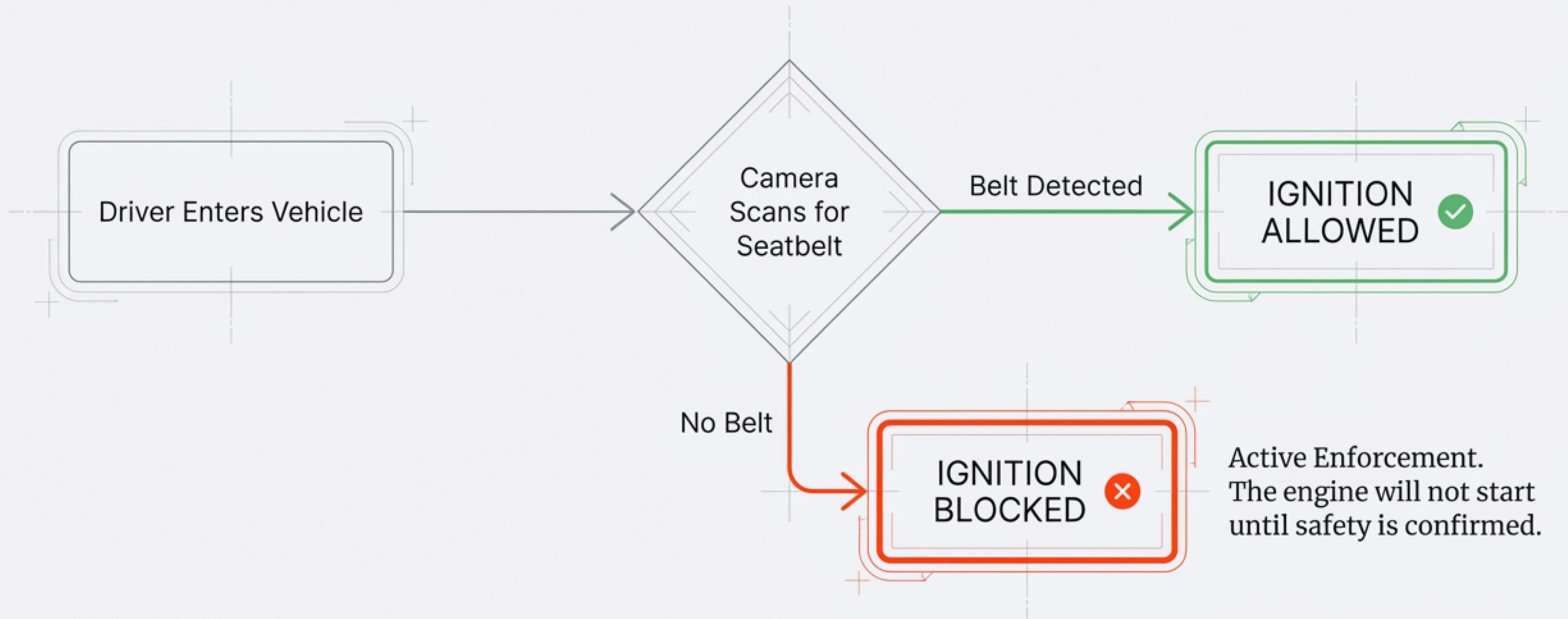
Introducing Kavach AI

A Python-based safety ecosystem that combines computer vision with hard enforcement and local empathy. “Kavach” translates to “Armor”—a digital shield sitting in the passenger seat.



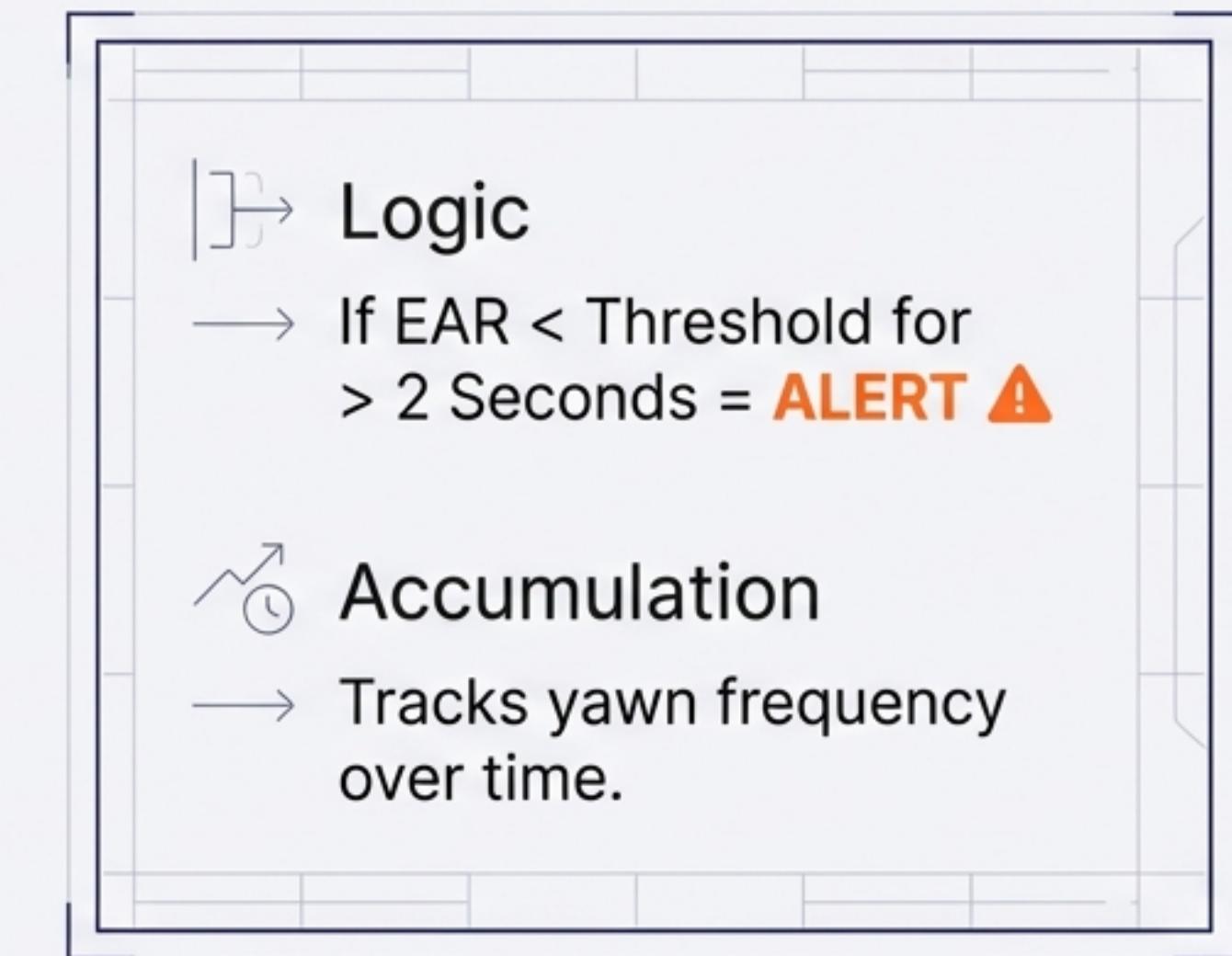
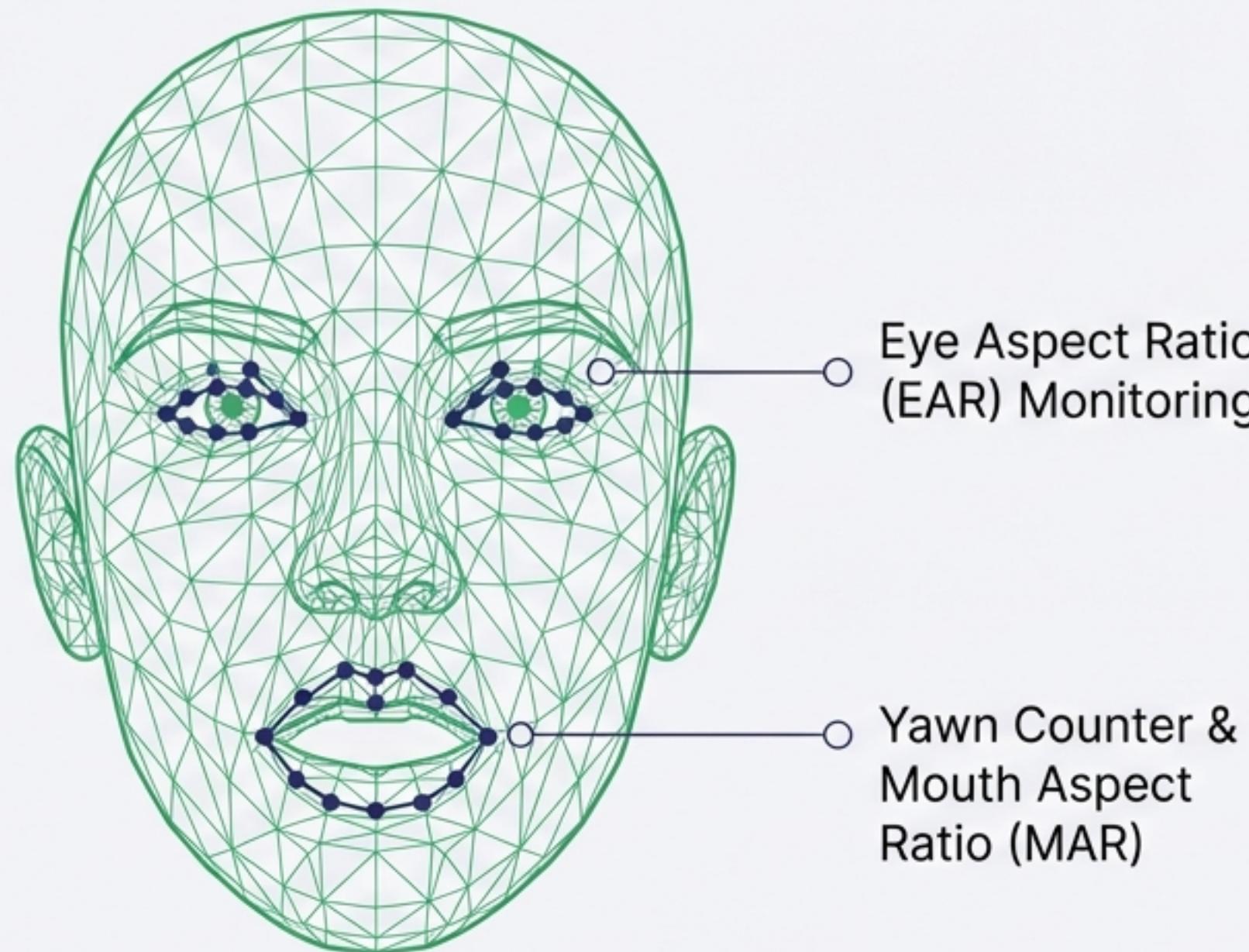
Hard Intervention: The Seatbelt Interlock

Zero compromise on safety basics.



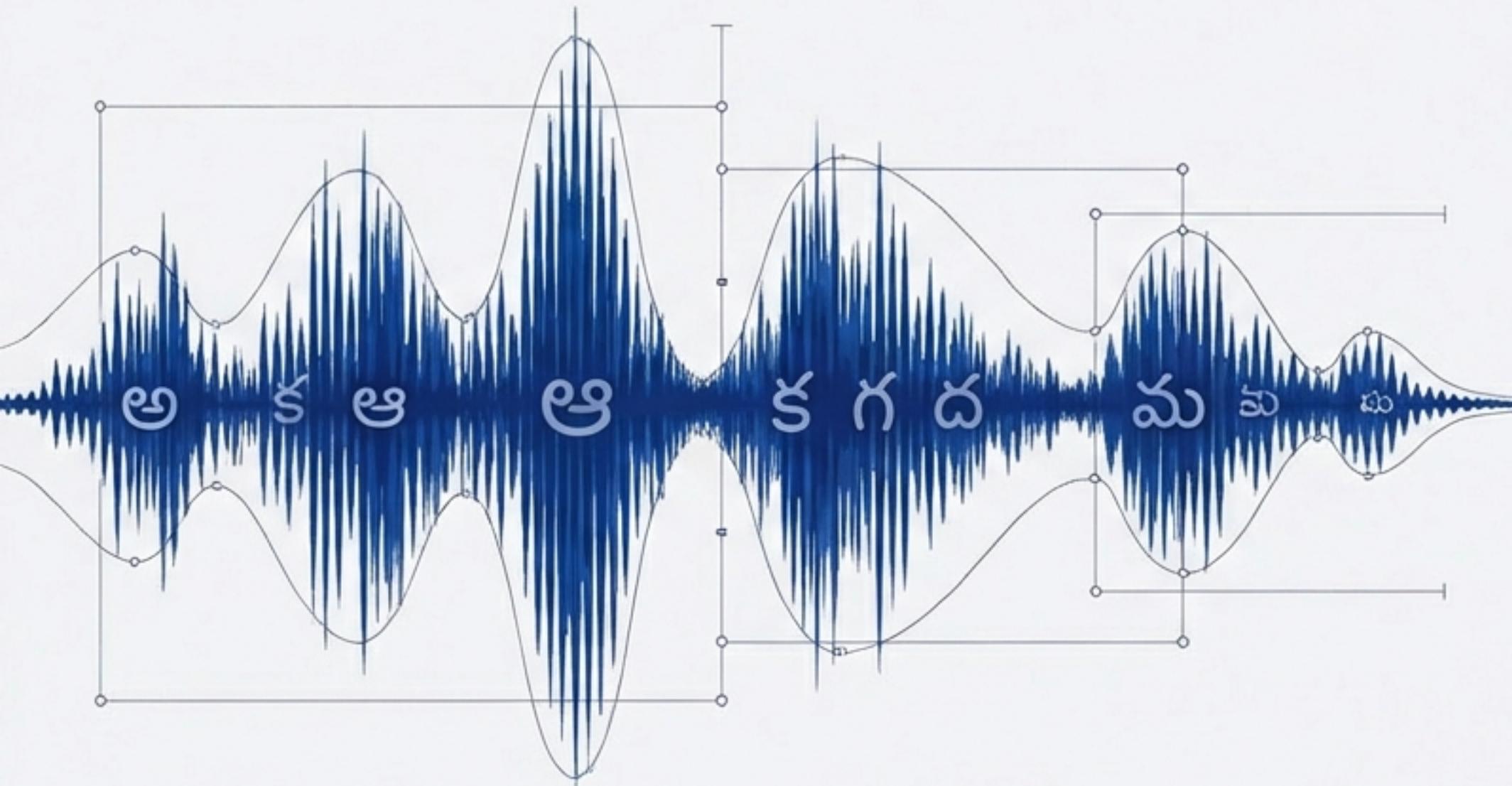
Real-Time Vigilance: Eye & Yawn Detection

Utilizing MediaPipe for precise facial landmarking to calculate fatigue metrics.



Safety Speaks the Driver's Language

In high-stress situations, the brain responds fastest to its native language.
Generic beeps are noise; a voice in your mother tongue is a command.

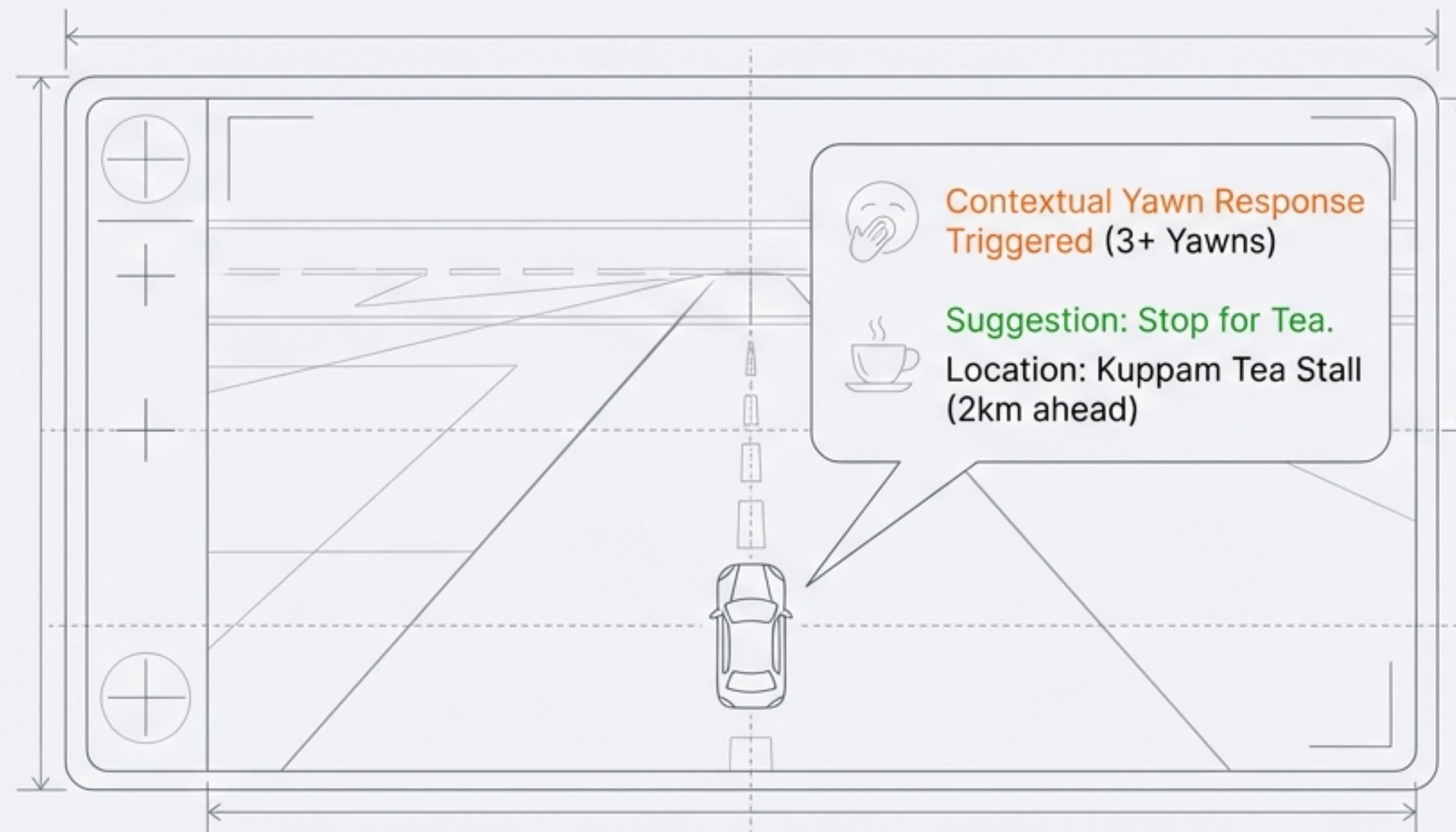


Feature: Telugu Voice Alerts

Implementation: All safety warnings—from seatbelt reminders to wake-up calls—are delivered in Telugu, ensuring instant comprehension for the local demographic.

Empathy in Algorithms: Context-Aware Suggestions

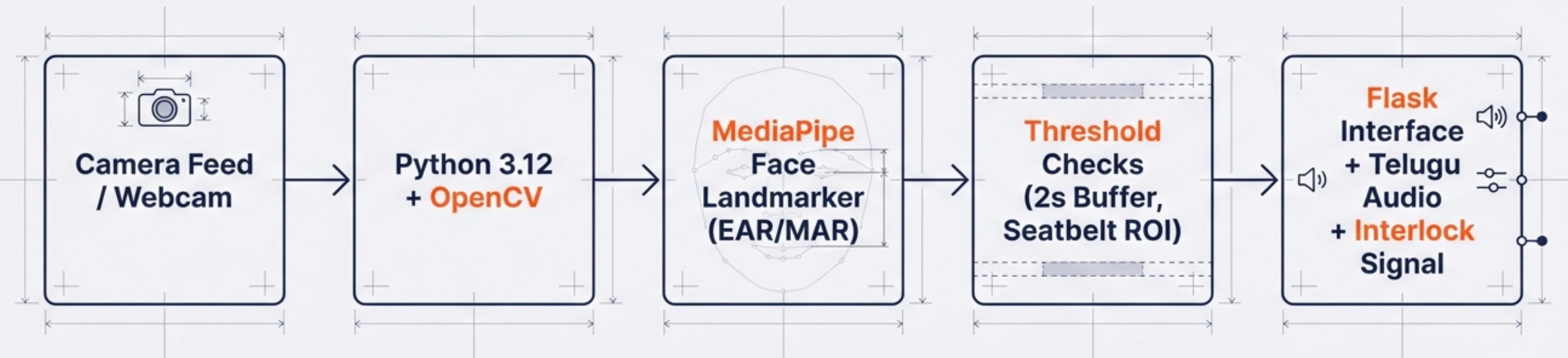
Building trust by offering solutions, not just alarms.



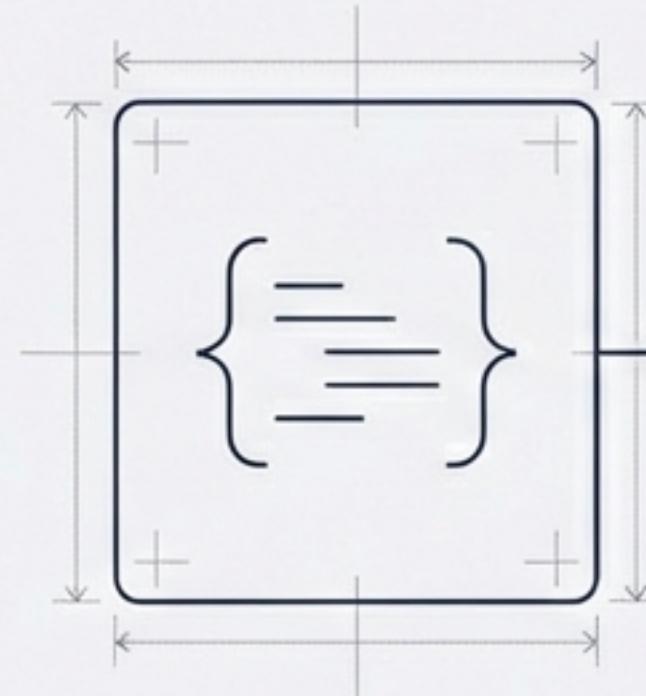
Instead of a jarring alarm, the system recognizes fatigue patterns and suggests specific, local rest stops (e.g., Kuppam).

This transforms the AI from a critic into a companion.

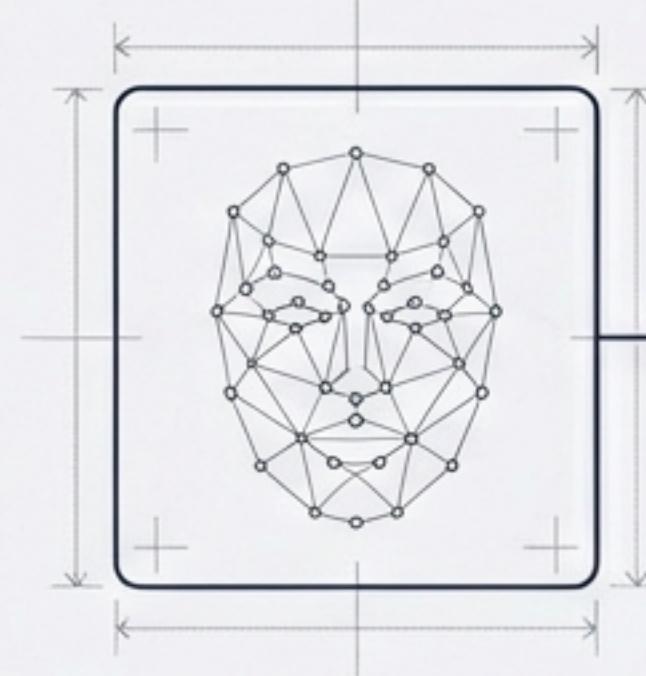
System Architecture



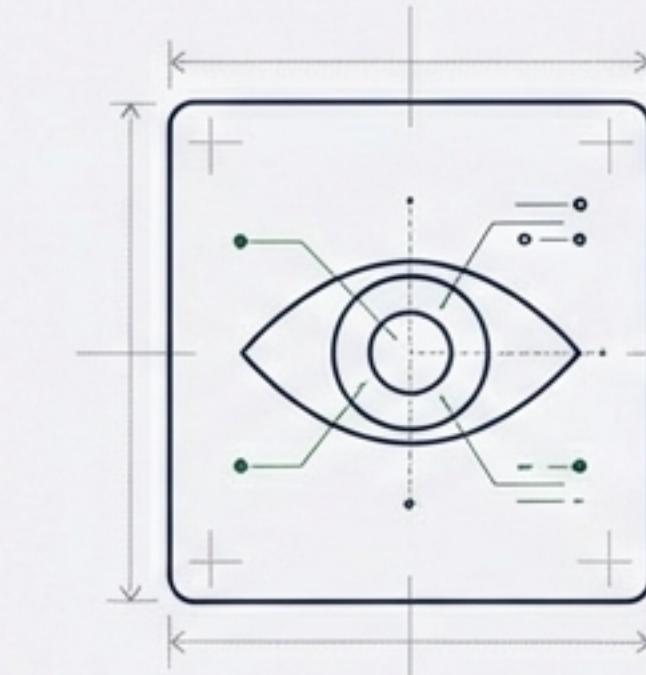
Built on a Robust Python Stack



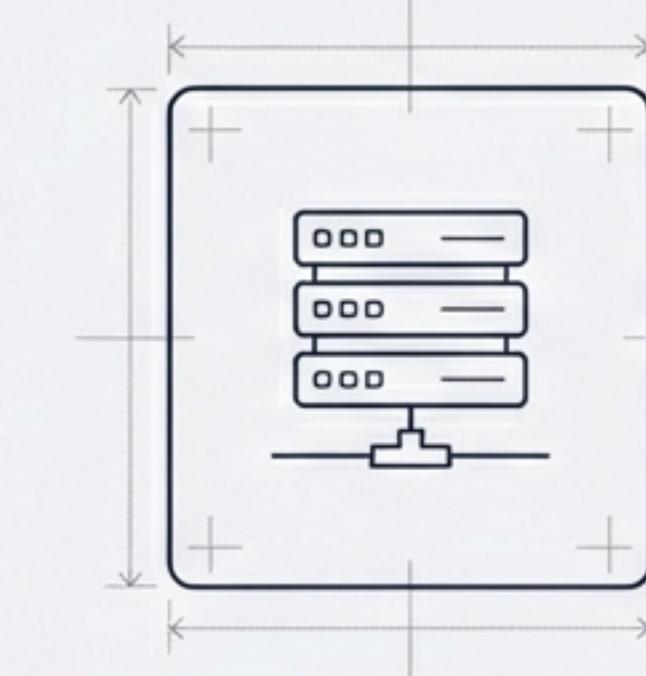
Core Language
Python 3.12.6. Selected for speed and library support.



Face Tracking
MediaPipe. Google's ML framework for high-fidelity face tracking.



Computer Vision
OpenCV & NumPy. For image processing and efficient array calculation.



Interface
Flask. Lightweight web server for the driver dashboard.

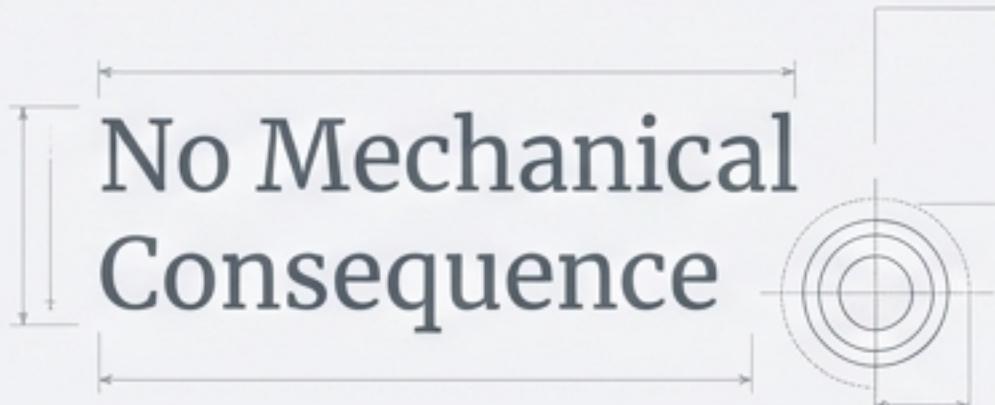
The Kavach Advantage

Standard Systems

Passive Beeps
(Ignored)



English Only
(Language Barrier)



No Mechanical
Consequence

Kavach AI

Active Interlock
(Engine blocked until safe)



Localized Alerts
(Telugu voice commands)



Empathetic UX
(Specific suggestions:
Kuppam Tea)



Our Vision: The Road Ahead

Kavach AI proves that safety technology doesn't have to be expensive or generic. By combining computer vision with cultural context, we create a system that drivers actually respect.

“Protecting every journey, from the engine start to the tea stop.”