



# APLIKASI MUDAH ALIH Sistem Anti-Microsleep dengan Avatar AI Chatbot



A smart mobile system that detects driver fatigue in real-time using the camera and triggers automatic alerts. Integrated with an interactive voice-enabled AI chatbot supporting multiple languages.

DATE: 7 OCTOBER 2024

Acknowledging innovation and impact.

# AWARDS NOMINEE & RECOGNITIONS

WE ARE HONORED TO BE RECOGNIZED AS A NOMINEE IN THE SELANGOR GRANT PROJECT 2024 (RM 30,000).

GTIDS WAS PROUDLY FEATURED ON UITM'S OFFICIAL INSTAGRAM, HIGHLIGHTING OUR EFFORTS IN ENHANCING ROAD SAFETY THROUGH AI.

🏆 THIS RECOGNITION REFLECTS TEAM'S PASSION AND DEDICATION.





# Grant Expenditure Report

Vote 11000 - Salary and wages	$RM2,000 \times 2 \text{ GRA} \times 4 \text{ months}$ =RM16,000
Vote 35000 - Accessories and Equipment	Smartphone & TV Screen =RM4,500
UiTM Research Services Allocation (5%)	$RM30,000 \times 5\% = RM1,500$
TOTAL (Feb - May)	RM22,0000



DURATION: 6 MONTH (1.2.2025 UNTIL 31.7.2025)

# PROJECT CONTRIBUTORS

## DEVELOPERS



AHMAD MIRZA

(MICROSLEEP SYSTEM + GOOGLE  
ML KIT + FACE DETACH/FLUTTER)



SHAFURAH

(AVATAR CHATBOT & TTS  
SPEECH INTEGRATOR/FLUTTER)

## RESEARCHER



Ts DR. NORKHUSHAINI BINTI AWANG

HEAD RESEARCH PROJECT / RESEARCH  
OFFICER 1/LECTURER



DR. MUHAMMAD IZZAD BIN RAMLI

SPEECH INTEGRATION EXPERT /RESEARCH  
OFFICER 2 / LECTURER



Pn. NORHAFLYZA BINTI MARBUKHARI

RESEARCH OFFICER 3 / IEEE EXPERT/  
LECTURER



# INTRODUCTION

# WHAT OUR PROJECT IS ABOUT?



Microsleep Detection: Enhances road safety by detecting early signs of driver fatigue, preventing accidents through timely alerts.

AI Avatar Chatbot: Facilitates driver interaction using ChatGPT, integrated with Text-to-Speech (TTS) and Speech-to-Text (STT) for natural communication.

Broad Information Access: Provides comprehensive answers to diverse queries, leveraging ChatGPT's knowledge and pre-fed data to serve users of all ages.



## FACE DETECTION

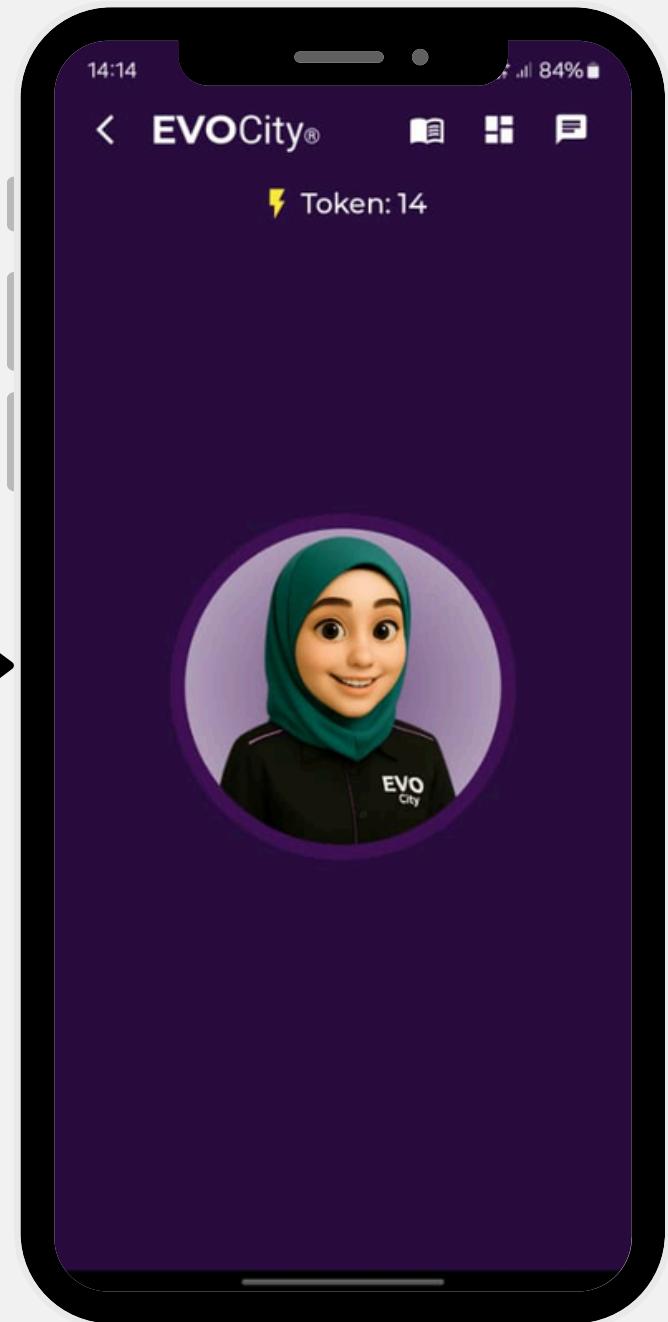
# GOOGLE MACHINE LEARNING KIT

This app uses Google ML Kit to detect key facial features in real-time using the device camera. The system continuously tracks the user's eye openness to detect drowsiness, Mouth openness to detect yawning, Head angle/position to determine focus level

When signs of fatigue like prolonged eye closure or wide-open mouth are detected, the app triggers warning popups and sound alerts to keep the driver awake and safe. ML Kit runs on-device, ensuring fast processing without internet dependency ideal for real-time driver monitoring while maintaining privacy.

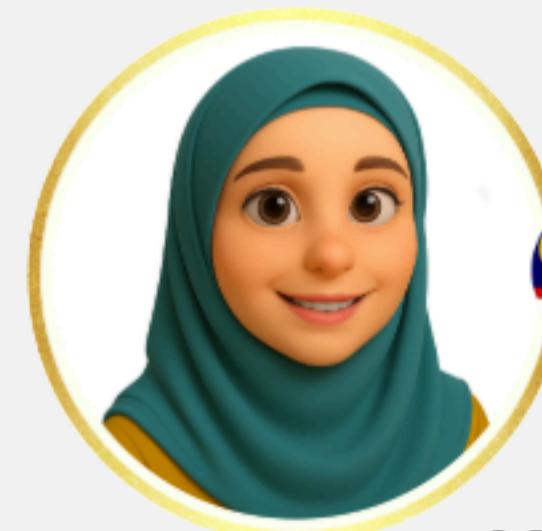


PROTOTYPE

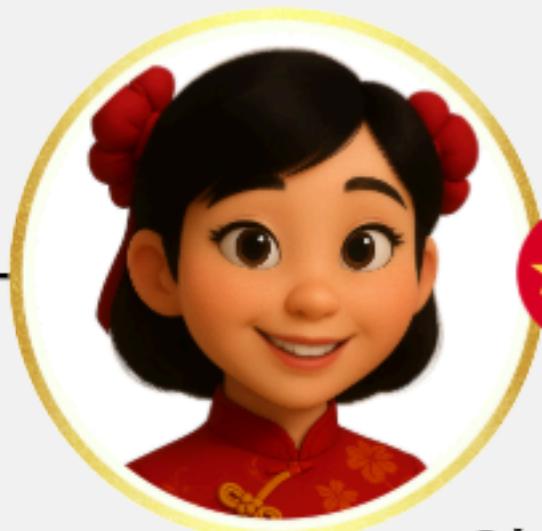


FINAL PRODUCT

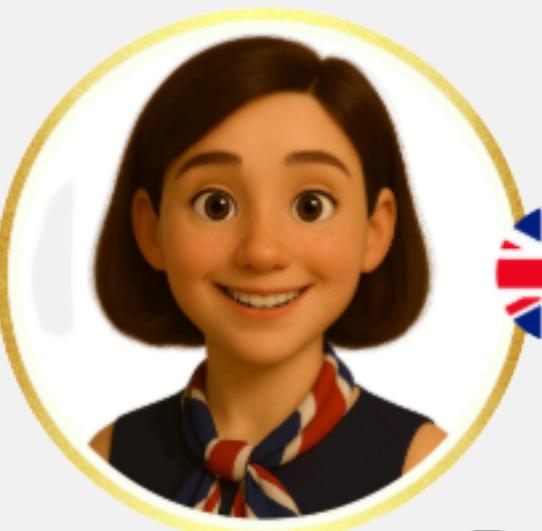




Malay



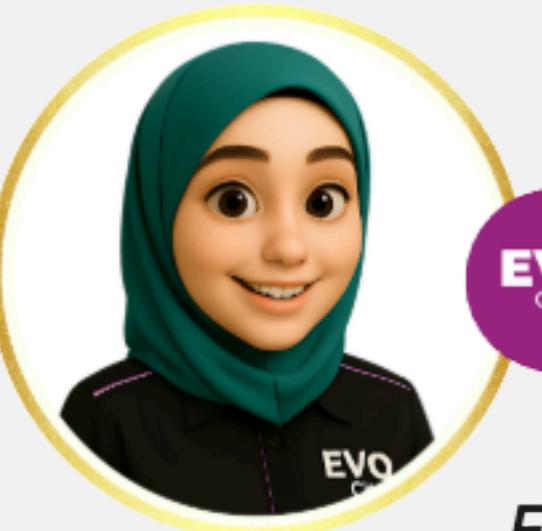
Chinese



English



India



Evo A.I.



Arab



Korea

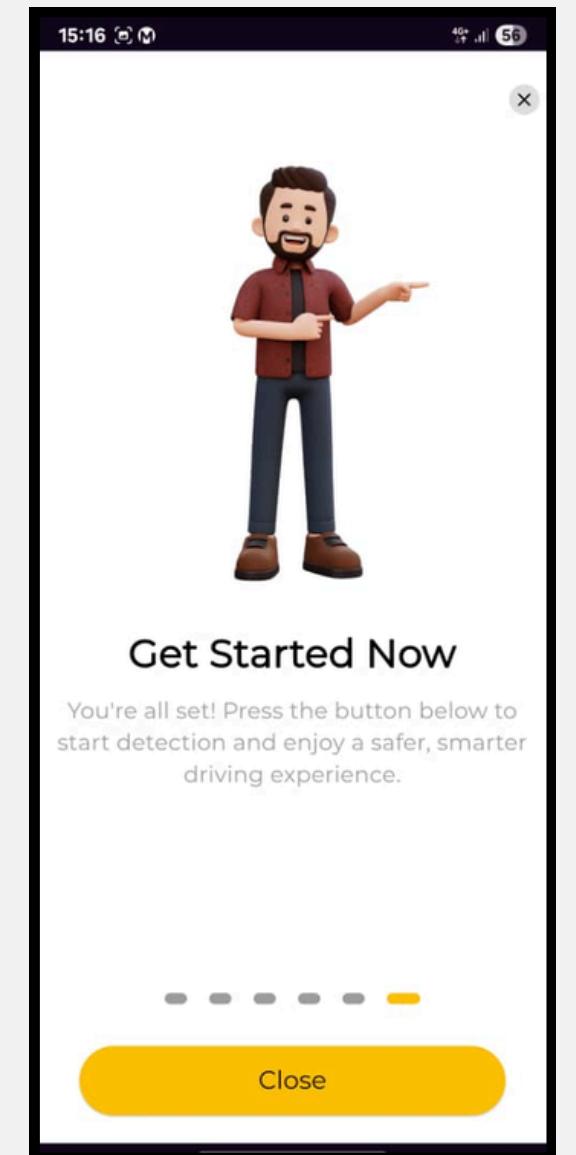
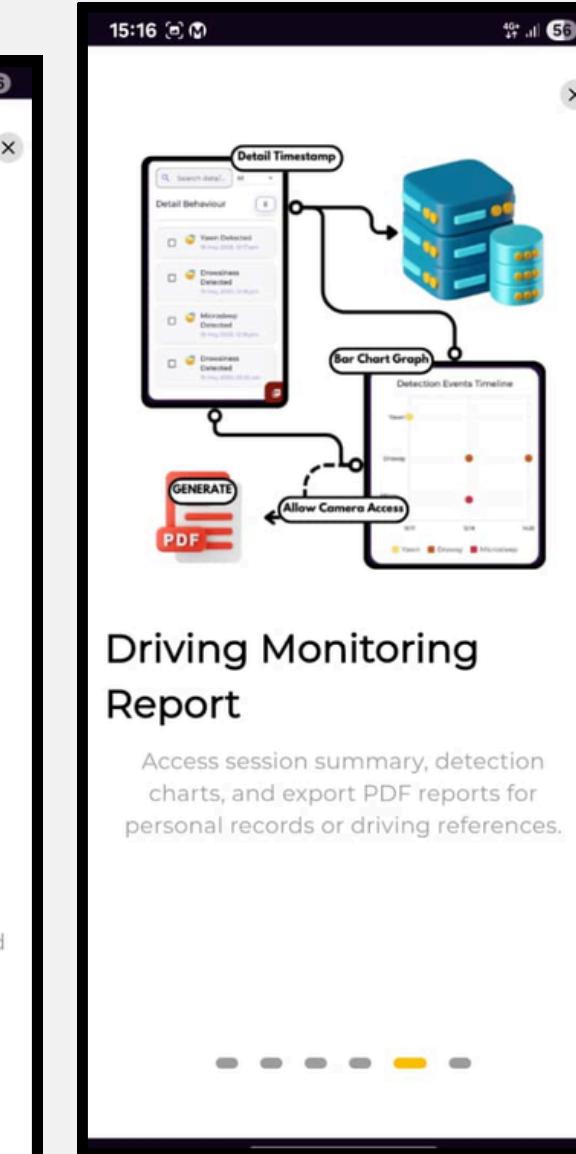
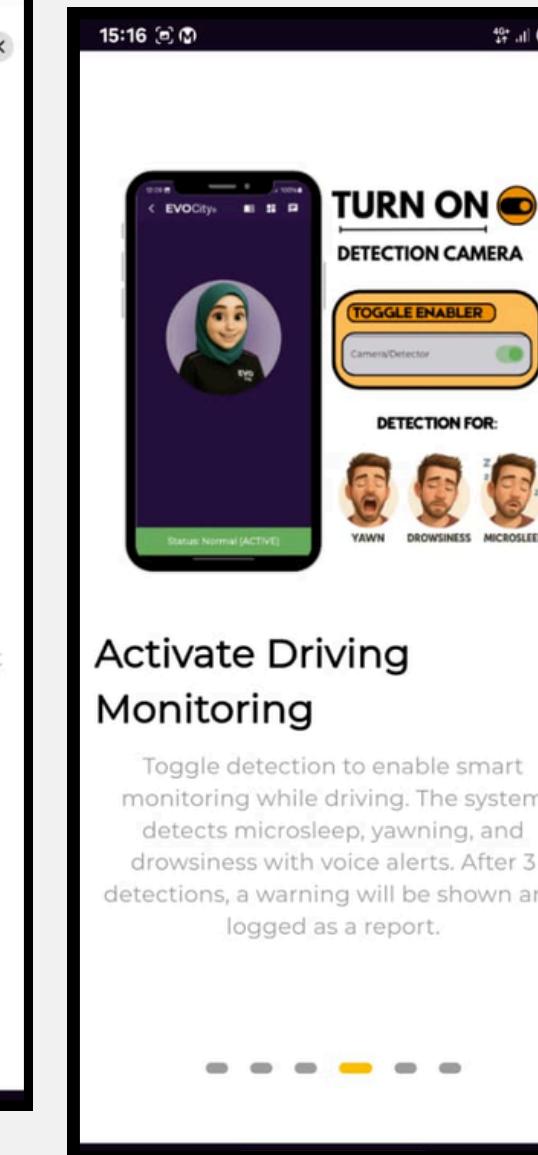
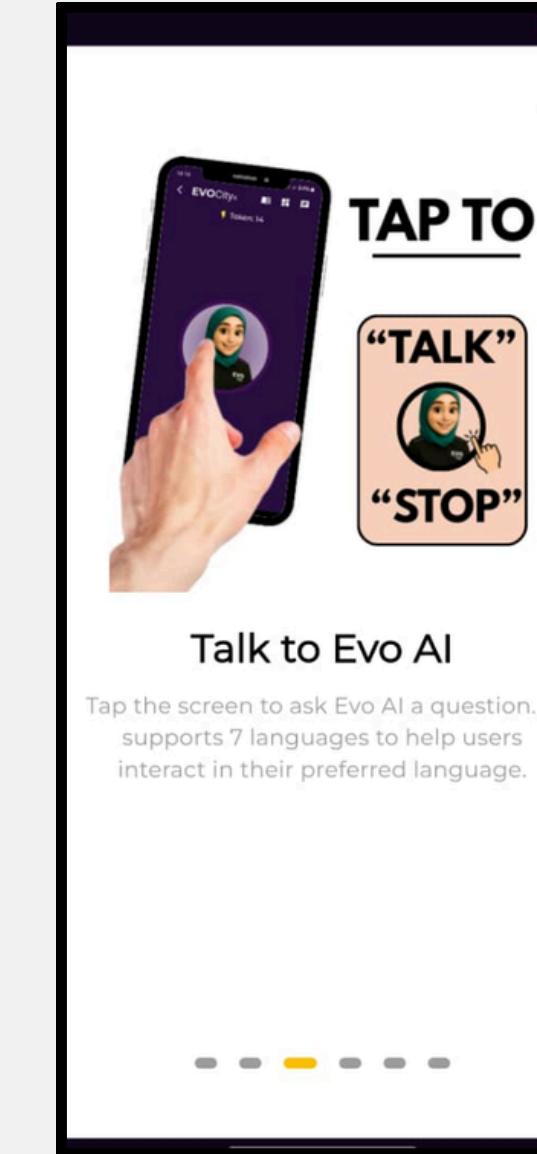
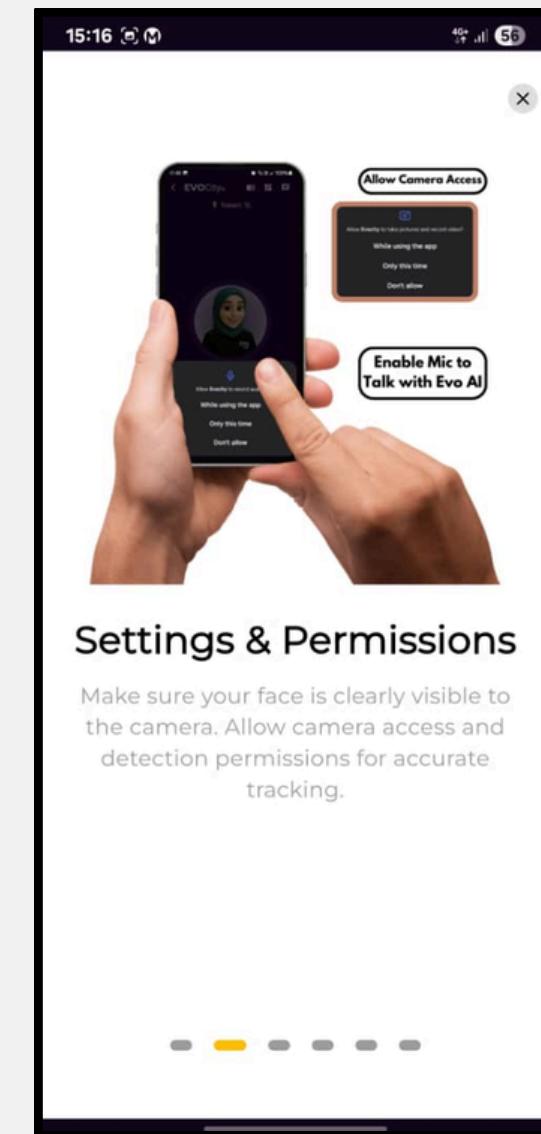
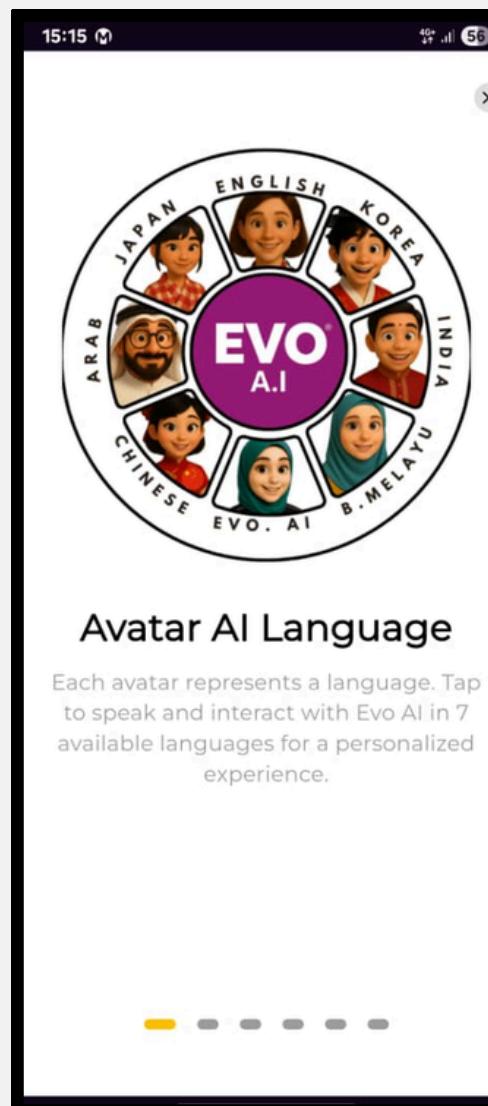


Japan

AVATAR A.I.  
**LANGUAGE**



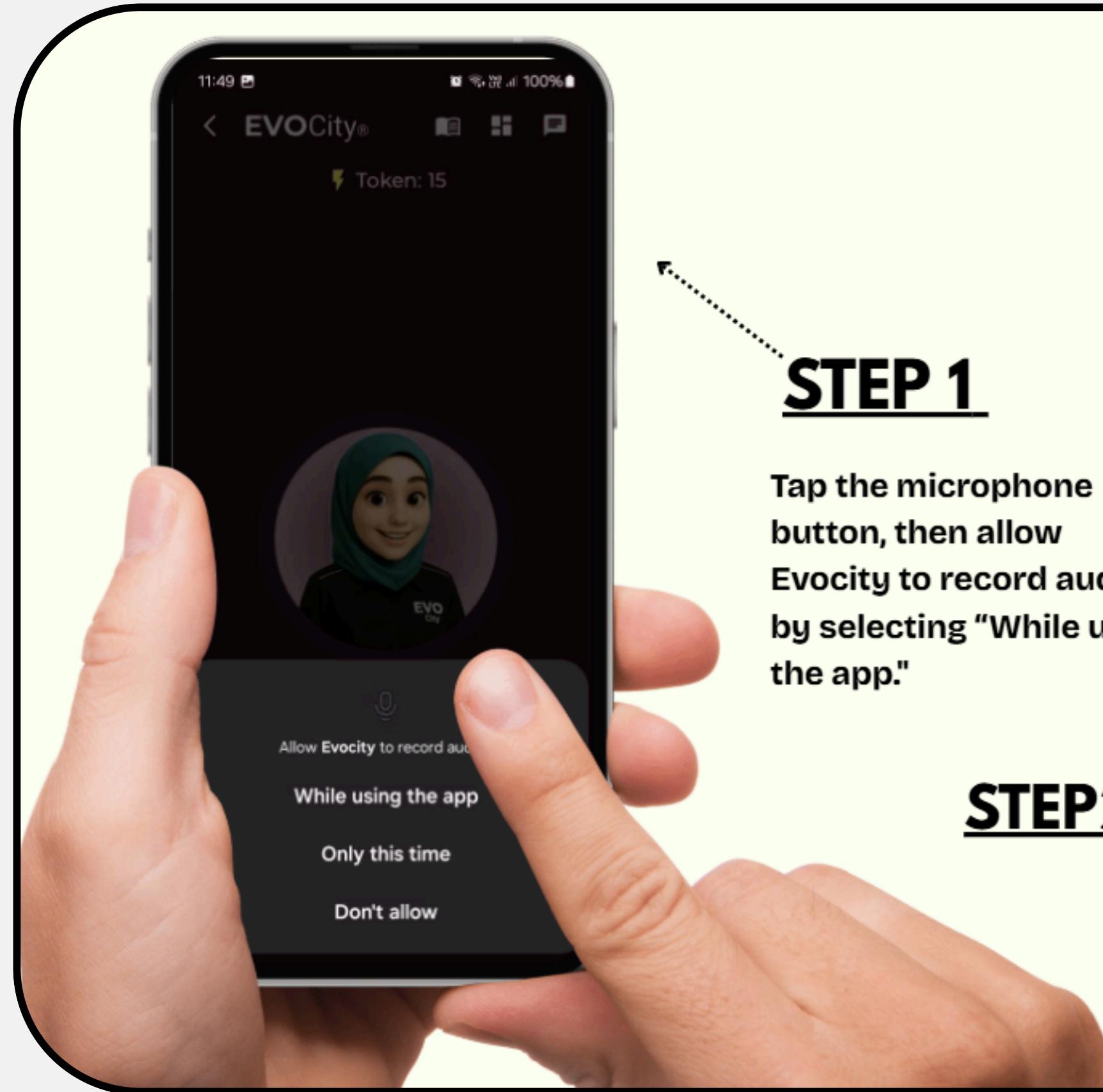
# QUICK GUIDE



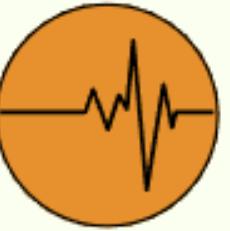
Start by allowing camera and mic access. Then, activate the system using the Toggle Enabler status must show "Normal (ACTIVE)". While driving, the app will detect yawning, drowsiness, or microsleep, and give popup + sound alerts.

To chat, tap the AI avatar and speak it responds with voice in your selected language. View detection history and export reports in the Dashboard.





# ENABLE



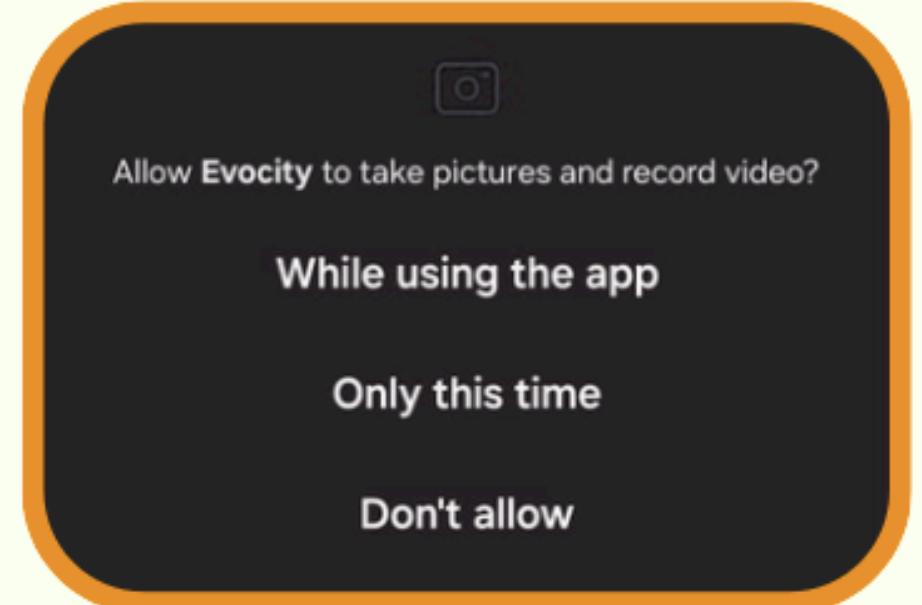
## MICROPHONE & CAMERA

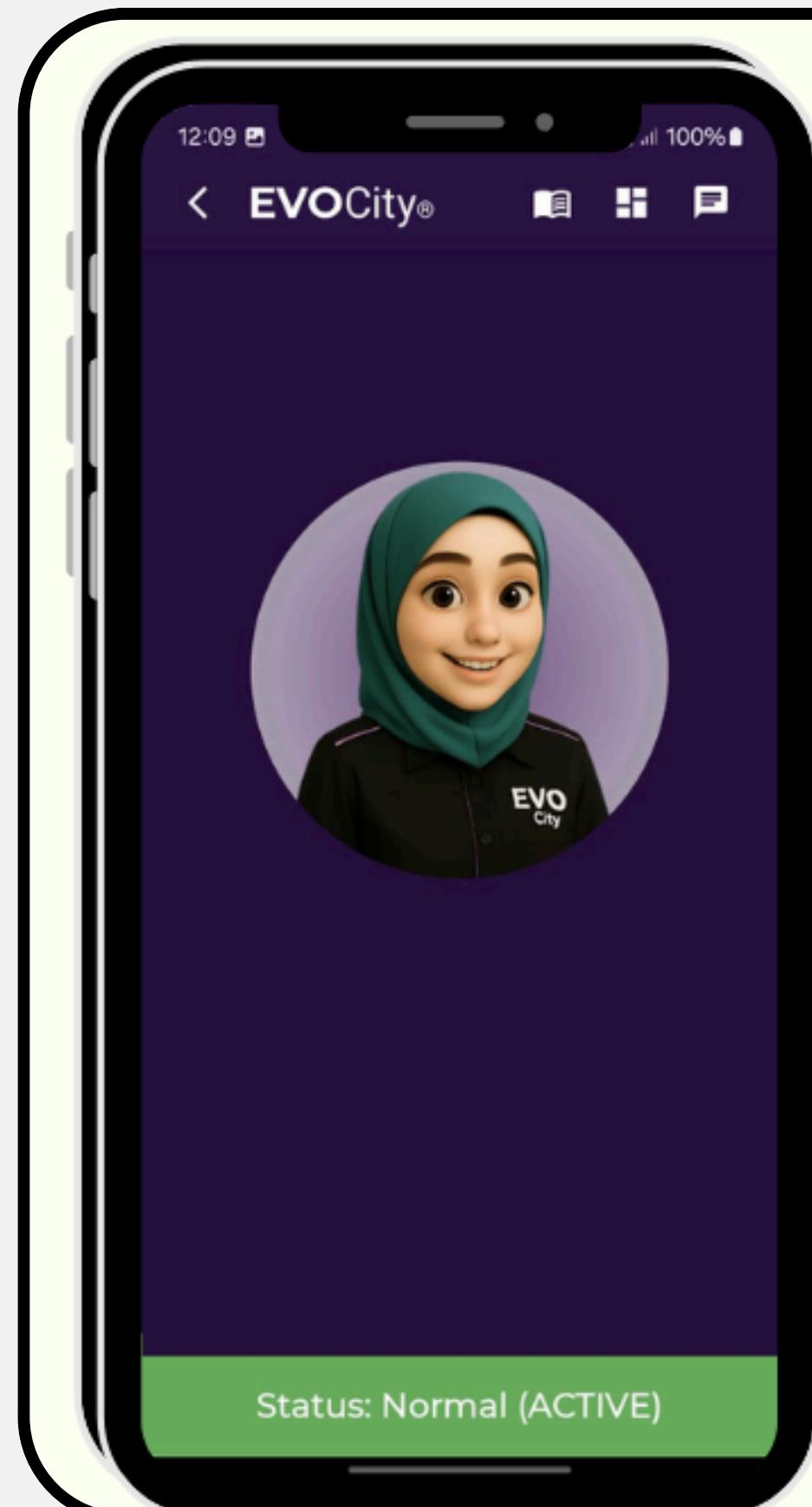
### STEP 1

Tap the microphone button, then allow Evocity to record audio by selecting "While using the app."

### STEP2

When prompted, allow Evocity to access the camera by selecting "While using the app" to enable video recording.





12:09 100%  
< EVOCity® 🔍 📁 🗃

Status: Normal (ACTIVE)

# TURN ON DETECTION CAMERA



## STEP 1:

**TOGGLE ENABLER**

Camera/Detector

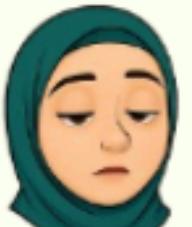


- Use the Toggle Enabler in the app to activate the system.
- The status will show “Normal (ACTIVE)“ when it’s running.

**DETECTION FOR:**



YAWN



DROWSINESS



MICROSLEEP

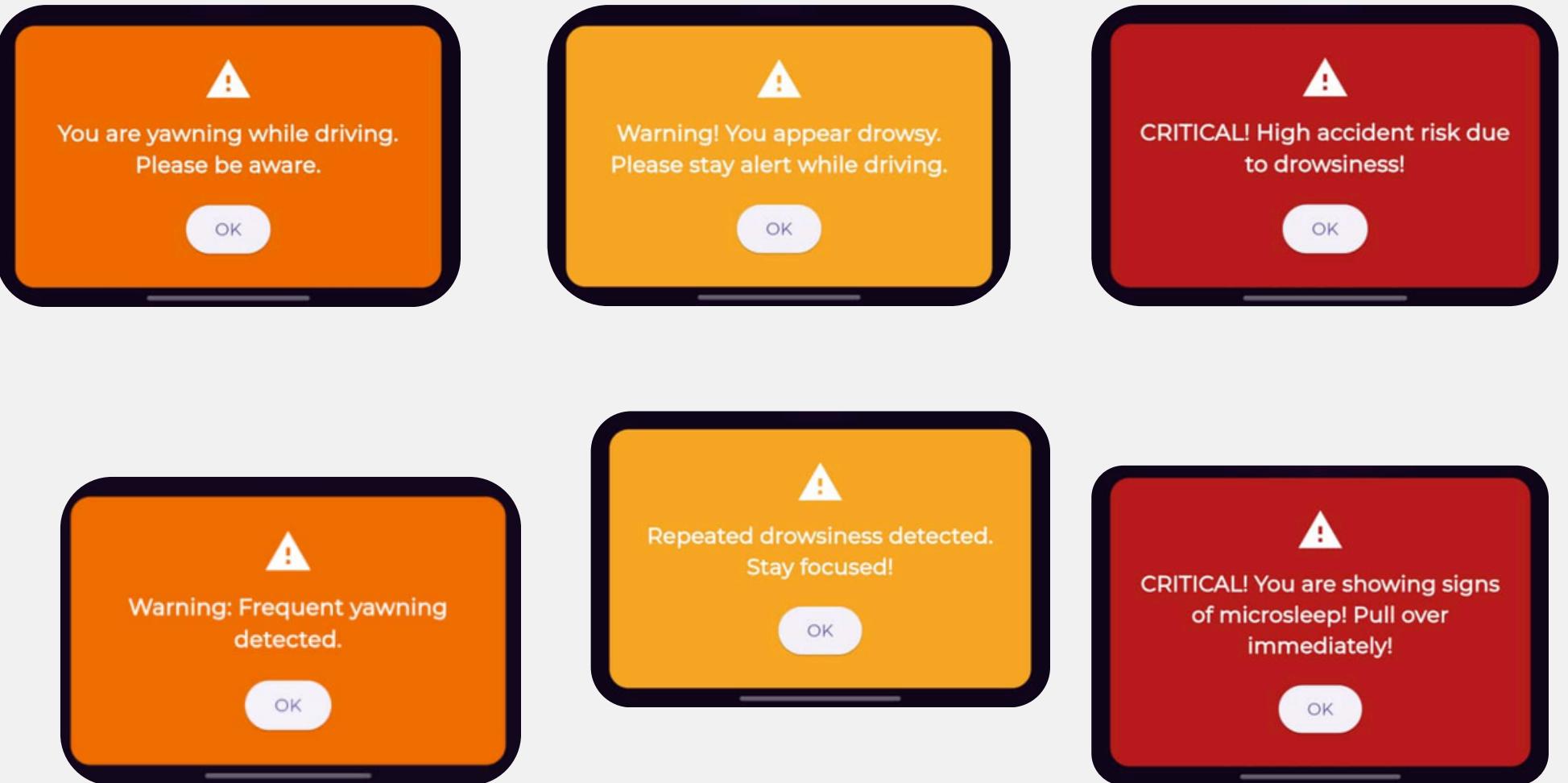
***Ensure your safety feature is active by enabling the detection camera in the EVOCity app. This smart camera system detects signs of driver fatigue.***



# POP-UP AS REMINDER

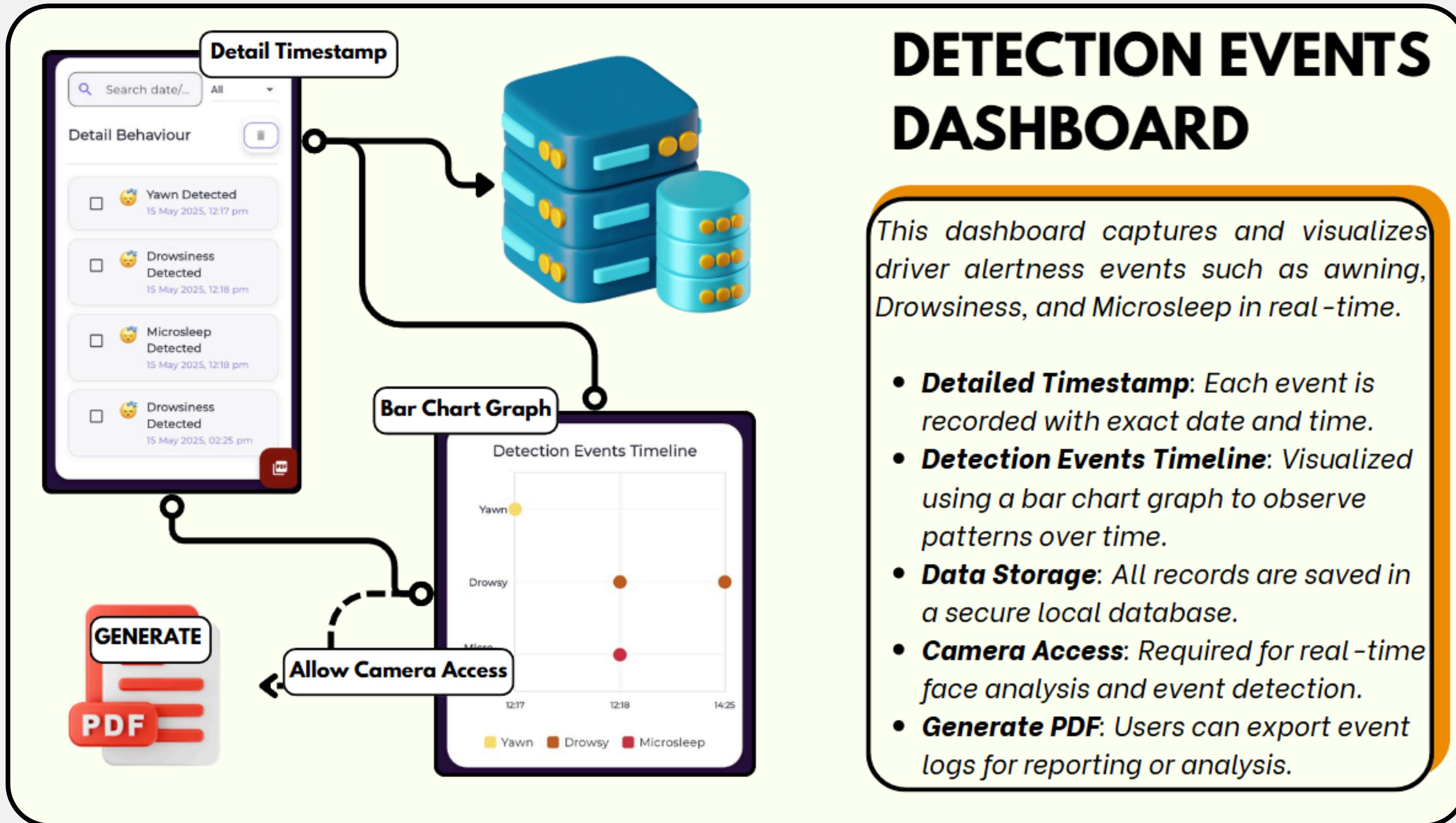
```
final Map<String, List<String>> drowsyMessages = {  
    "en-US": [  
        "Warning! You appear drowsy. Please stay alert while driving.",  
        "Repeated drowsiness detected. Stay focused!",  
        "CRITICAL! You're falling asleep repeatedly!",  
        "CRITICAL! High accident risk due to drowsiness!",  
        "CRITICAL! You are showing signs of microsleep! Pull over immediately!",  
        "CRITICAL! Stop and rest immediately!",  
    ],
```

```
final Map<String, List<String>> yawnMessages = {  
    "en-US": [  
        "You are yawning while driving. Please be aware.",  
        "Warning: Frequent yawning detected.",  
        "CRITICAL! Repeated yawning!",  
        "CRITICAL! Persistent fatigue detected!",  
        "CRITICAL! Take a break now!",  
    ],
```



Every time yawning, drowsiness, or microsleep is detected, the app will trigger a popup alert with sound to warn the driver. These real-time warnings help drivers stay alert and avoid accidents. Repeated detections will increase the urgency of alerts, including looping alarms for critical cases.







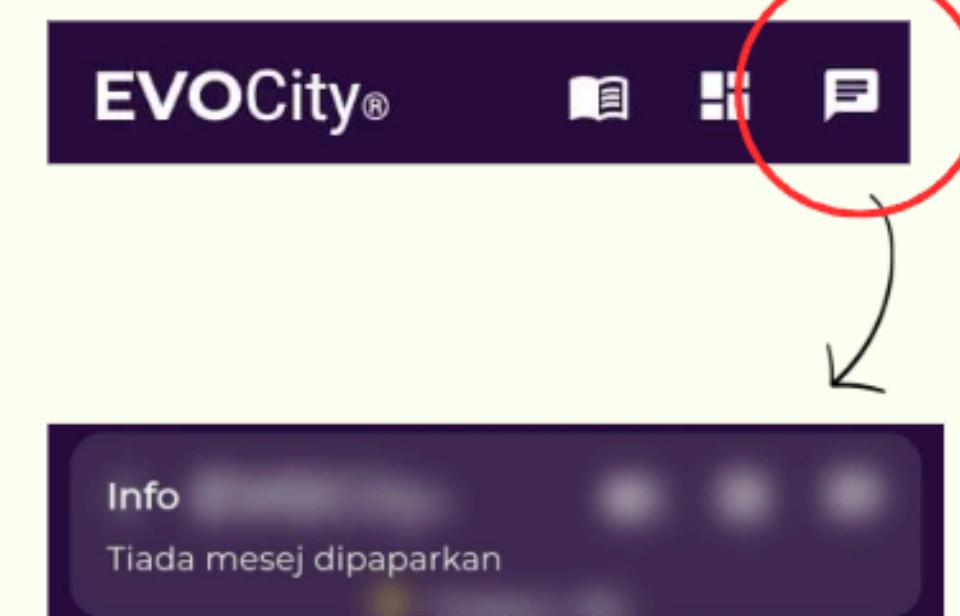
# AZURE Text-To-Speech VOICE COMMUNICATION

Drivers can talk naturally with the AI chatbot using voice. The system uses Speech-to-Text (STT) to understand and Text-to-Speech (TTS) to reply all in multiple languages.

[Next Slide](#)



# VOICE COMMUNICATION



*User input is speech-based only. Mic activates automatically when chat opens*

*Azure Text To Speech used to respond message in voice*

*Chat button pops out to show the messages*



# LANGUAGE

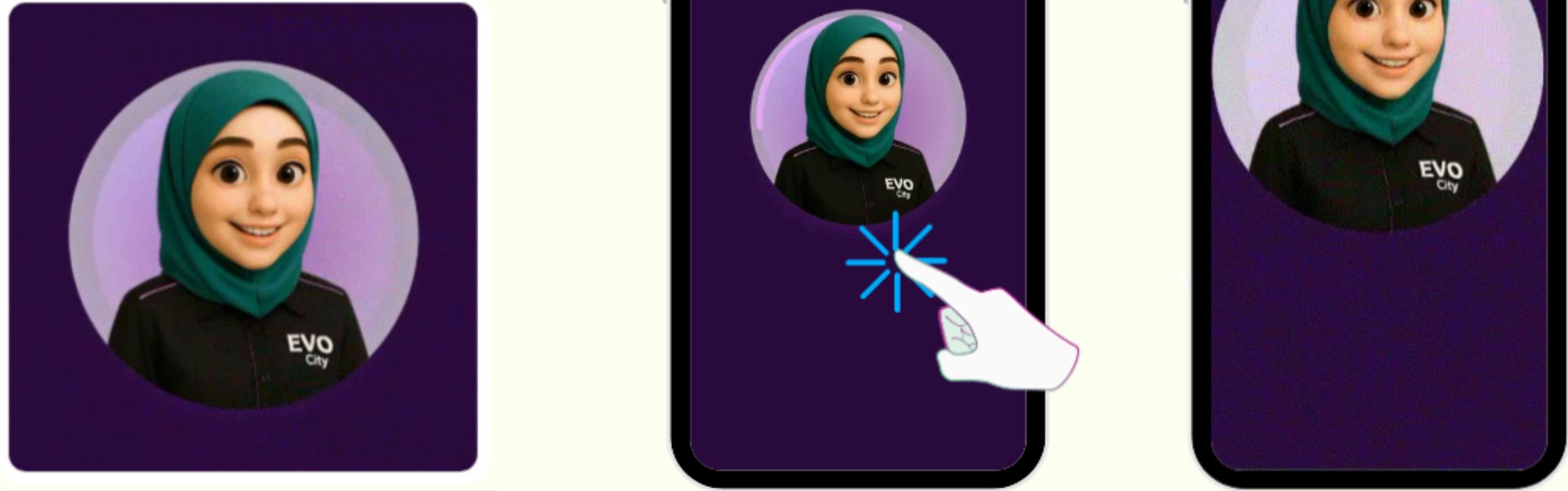
Multi language & Different Voice

Malay	→	Yasmin
English	→	Jenny
Chinese	→	Xiaoxiao
Indian	→	Aarav
Arabic	→	Hamdan
Korean	→	Hyunsu
Japan	→	Nanami

Left Screen (Chinese):  
你喝吗?  
喝啊，当然喝！不过我喝的是咖啡和茶，没办法陪你喝酒呢。你喜欢喝什么?  
你在干嘛?  
我在和你聊天啊！你在忙什么呢?  
我今天心情很好  
哇，听起来真棒！有什么特别的事情让你心情这么好？分享一下吧，我也想开心一下！  
谢谢你  
不用谢！有什么需要帮忙的吗?  
下一场再先  
关闭

Right Screen (Arabic):  
اهلا وسهلا  
اهلاً كيف حالك اليوم؟ شو الأخبار؟  
متى مازاً؟ وضح لي أكثر، يمكنني امساعدتك في الكثير من الأمور  
ماذا تفعل  
أهلاً مشفول بالدردشة معك الان.  
ماذا عنك؟ كيف تسير الأمور؟  
كتت اقرأ ما هو الكتاب الذي اعجبك جيبيك  
صعب اختيار كتاب واحد، لكن "الخيومياني" لما ولو كويلاو دائنا  
يترك أثر جميل، فيه حكمة وسحر،  
وكانه رحلة تبحث فيها عن ذاتك.  
قرأتة؟  
Default  
بلغ

# ANIMATION

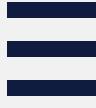


*Avatar animation shows mic ON to get user input and response activity*

*Tap avatar to toggle ON/OFF mic or stop EVO AI response*

*Color indicator for camera detector*



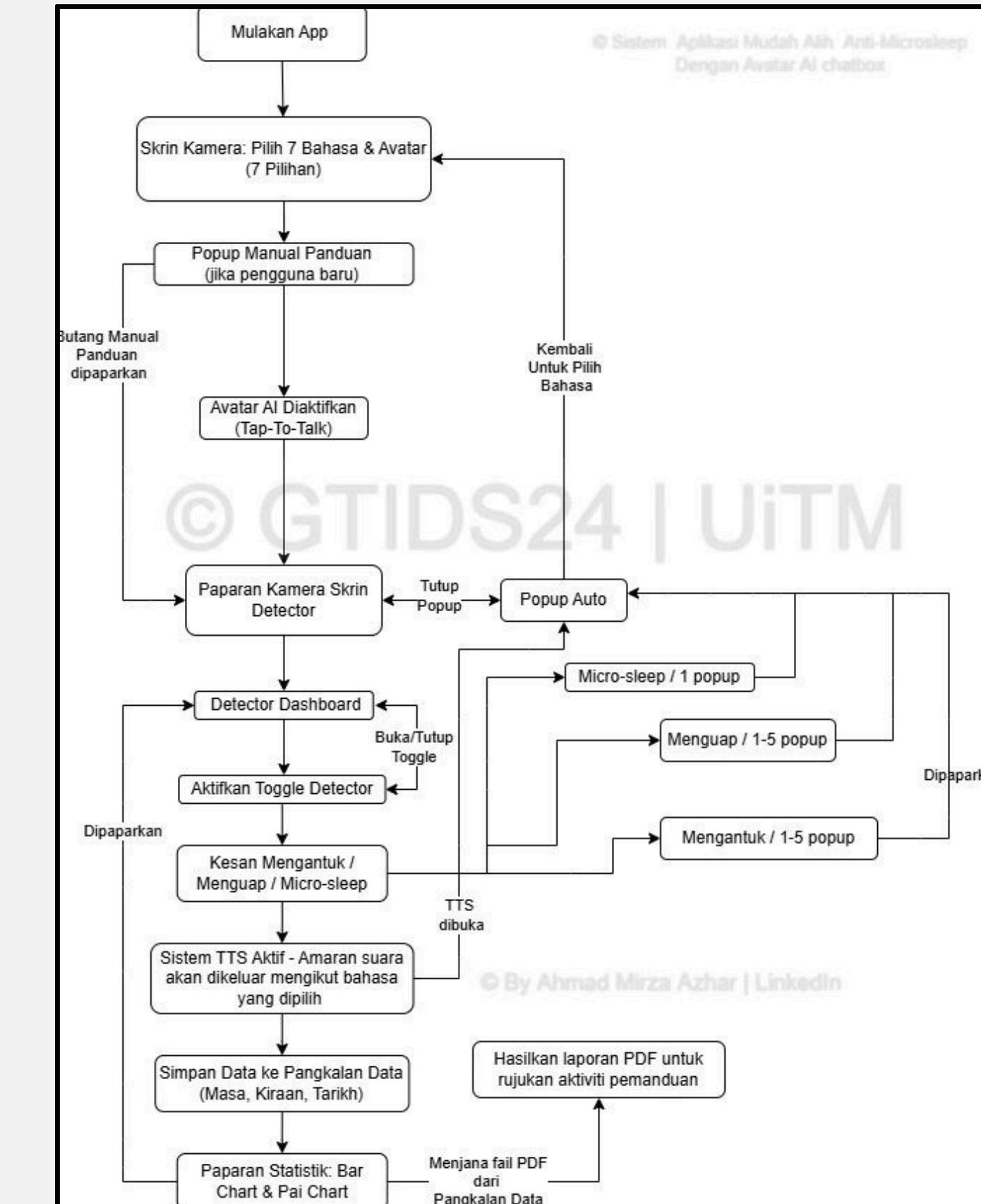


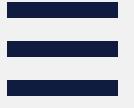
# FLOWCHART

The system begins by activating the camera and microphone. Once active, it continuously analyzes the driver's facial expressions and head position in real-time. If signs of yawning, drowsiness, or microsleep are detected, the system immediately triggers a popup warning with sound.

Simultaneously, all events are recorded with timestamps and stored in the local database. Users can access these logs via the dashboard, which includes graphs and an option to export reports as PDF.

Drivers can also interact with the AI avatar chatbot, which uses Speech-to-Text (STT) and Text-to-Speech (TTS) for hands-free communication in multiple languages.





DATE: 4 JUNE 2025

## PRESENTATION SESSION

# GTIDS (SELANGOR GRANT' 24)

WITH DIRECTOR OF INNOVATION  
(ENCIK SHAMSUL)

LOCATION: SUK SELANGOR, 47000,  
SHAH ALAM, SELANGOR, MALAYSIA



# Final Project Phase



**June 2025: Component & Initial Integration Testing**

- Chatbot: Focus on functional accuracy, conversational flow, and ChatGPT integration, including handling diverse user queries and error conditions.
- TTS/STT: Verify transcription and speech clarity, measure latency, and confirm seamless integration with the chatbot.
- Image Detection (Microsleep): Conduct initial accuracy tests under controlled settings and assess detection speed.
- Overall Integration: Ensure all components communicate correctly, addressing initial system-level bugs.



# Final Project Phase



**July, 2025: System, Performance & Usability Testing**

- **System Validation:** Perform comprehensive end-to-end testing across all functionalities.
- **Performance:** Measure system stability, response times, and resource consumption under various loads.
- **Microsleep Detection Refinement:** Enhance robustness by testing under diverse real-world conditions and fine-tuning alert triggers.
- **Usability:** Conduct internal assessments to optimize user experience.
- **Regression:** Continually re-test to ensure stability and prevent new defects.





# 'YOUR AI CO-DRIVER.'

## -FINAL THOUGHTS

GTIDS combines AI-driven detection and voice interaction to enhance driver safety and awareness. With continued support, we aim to bring this innovation from prototype to real-world impact.

Together, let's make roads safer — one alert at a time.



mirzaazhar3234@gmail.com



<https://mirzaazhar172.github.io>

# Thank You