



TRƯỜNG ĐẠI HỌC  
SƯ PHẠM KỸ THUẬT TP. HỒ CHÍ MINH  
HCMC University of Technology and Education

# DRIVER MONITORING SYSTEM

Special Project (EL)

# TEAM MEMBERS



**Le Hoang Tien**  
ID: 21145617



**Le Ho Minh Khoa**  
ID: 21145019



**Dang Xuan Quang**  
ID: 21145604

**Lecturer: Do Van Dung**  
**Subject ID: 232SPAE310733E**



# MAIN CONTENTS

**01**

REASONS OF  
CHOOSING THE  
TOPIC

**02**

MAIN  
COMPONENTS

**03**

CODING  
PROCESS

**04**

TESTING AND  
EVALUATIONS

**05**

CONCLUSION





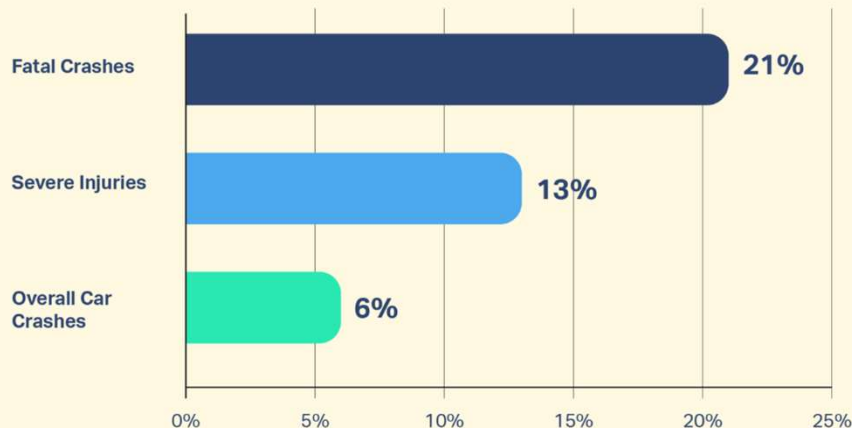
01

# REASONS OF CHOOSING THE TOPIC

# 1. Reason for choosing the topic

## 1.1. The rising car accident rates due to driver drowsiness

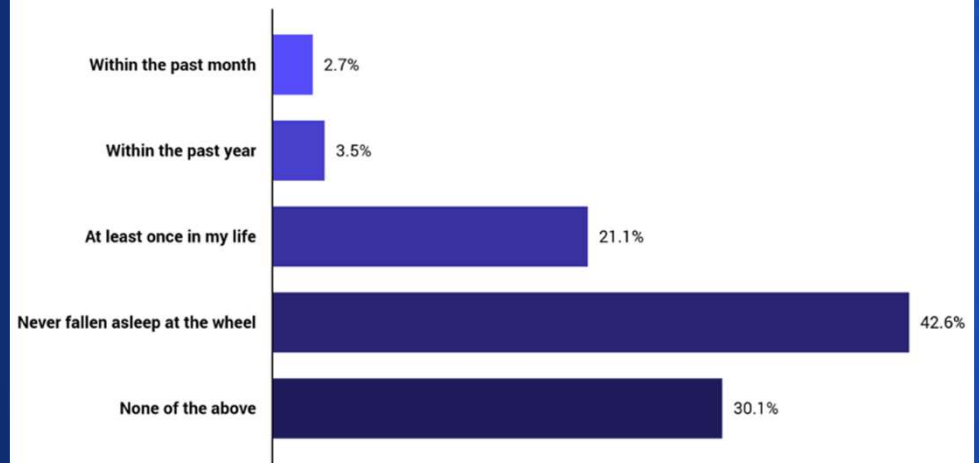
Percentage of U.S. vehicle crashes involving a drowsy driver



Source: AAA Foundation for Traffic Safety

Have you ever fallen asleep, or "nodded off" at the wheel?

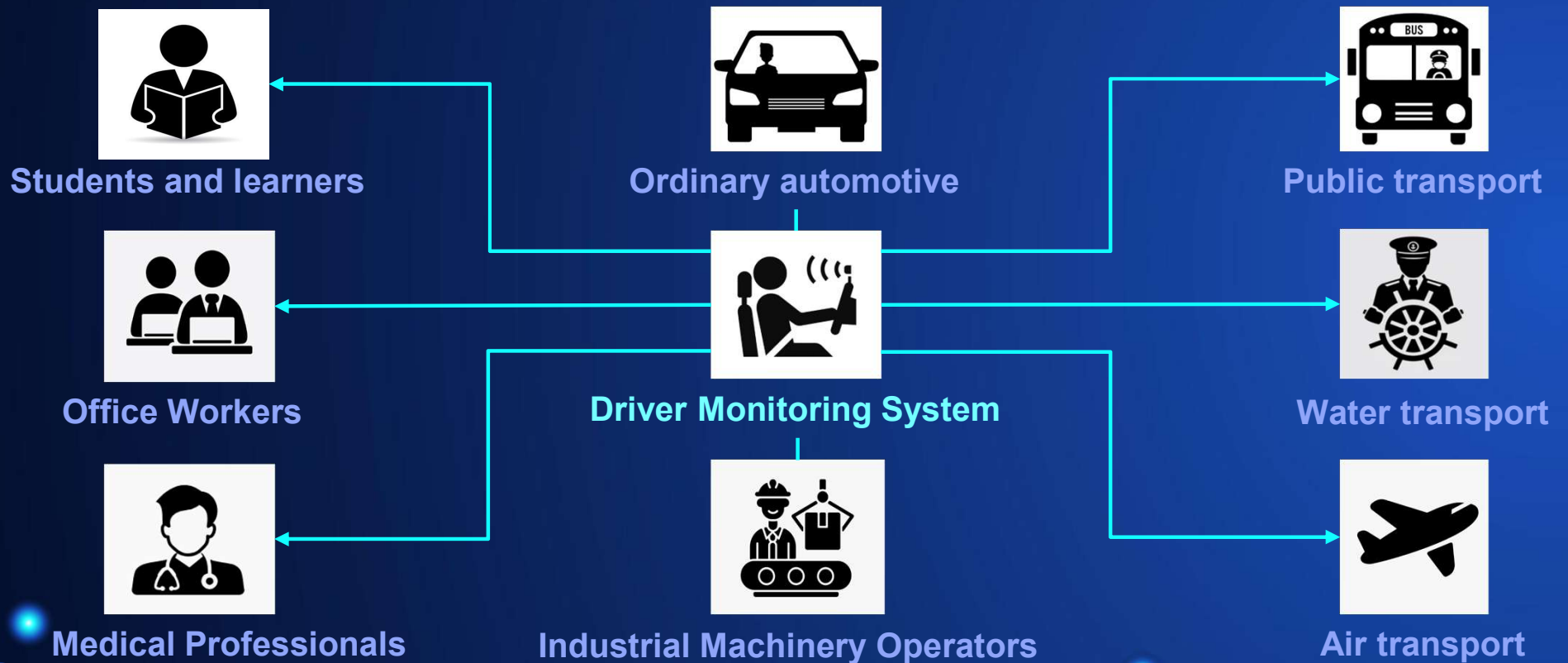
According to a 2019 survey of 2000 Americans



Sources: *Annie Atherton, Drowsy Driving Is a Factor in 21% of Fatal Crashes. November 6, 2023.*  
*The Zebra, Drowsy Driving Statistics, January 31, 2023.*

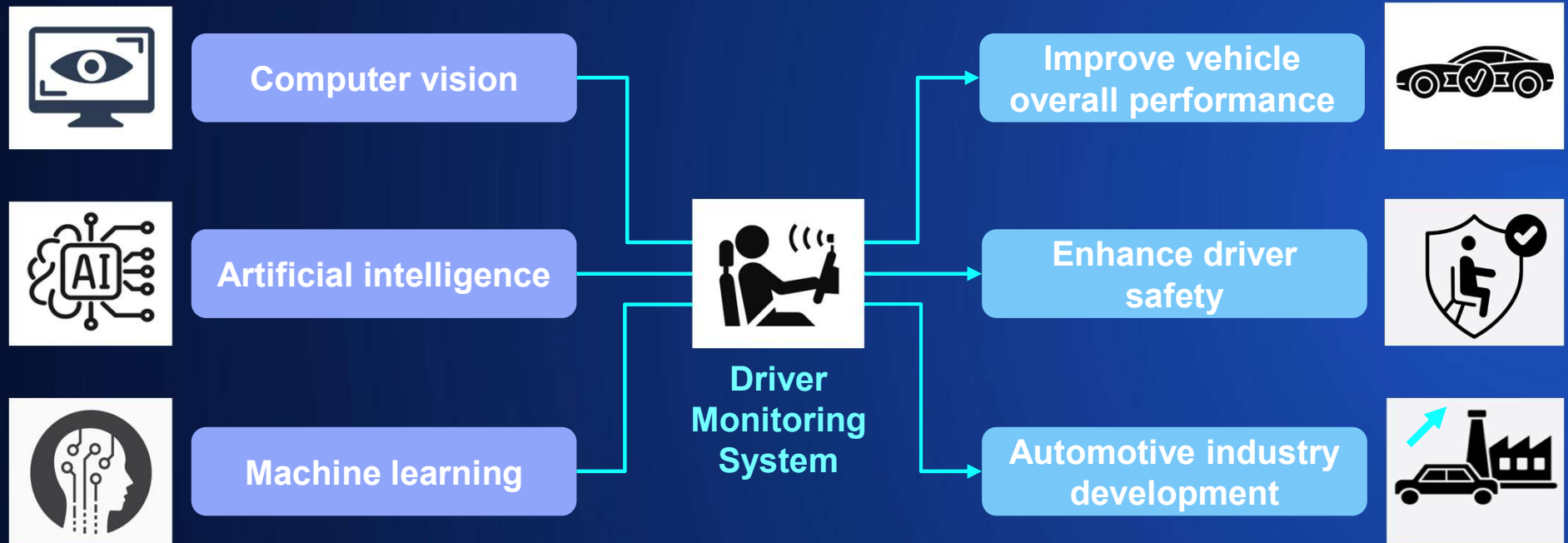
# 1. Reason for choosing the topic

## 1.2. Technology applicable across various fields



# 1. Reason for choosing the topic

## 1.3. The advancement in automotive technology





02

# MAIN COMPONENTS



## 2. MAIN COMPONENTS



Raspberry Pi 4B

1.500.000 VND



Logitech C270  
HD Webcam

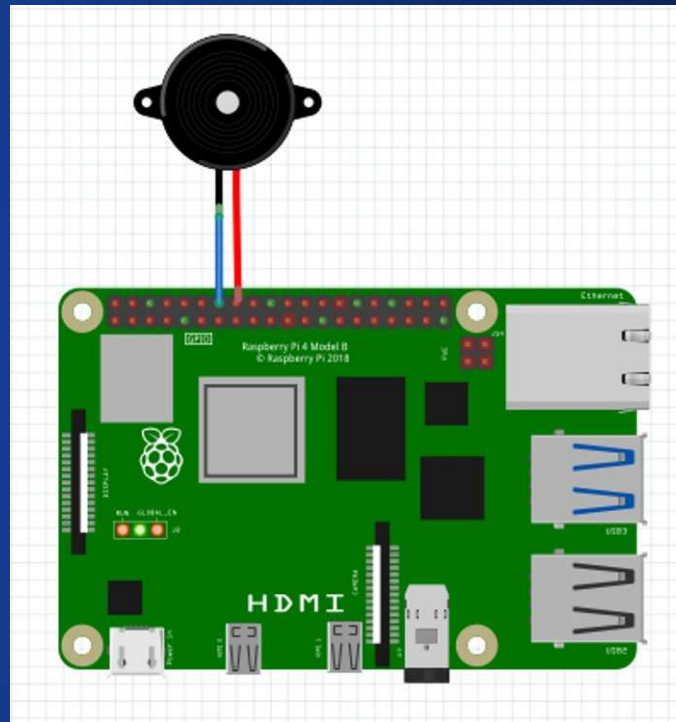
200.000 VND



PowerBank  
Anker

1.050.000 VND

## 2. MAIN COMPONENTS



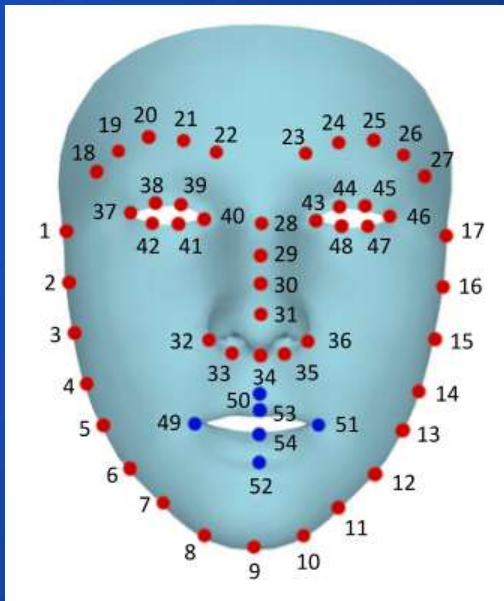


03

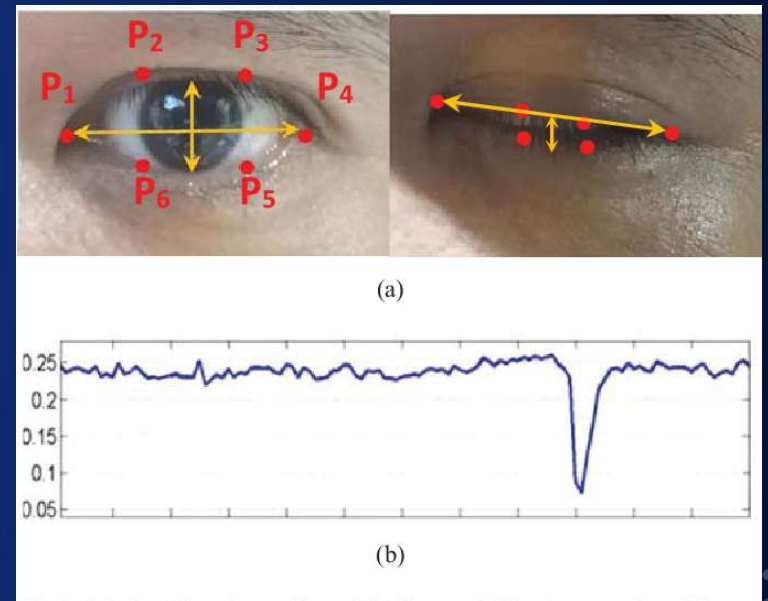
# CODING PROCESS

## 3.1. The theory behind the code

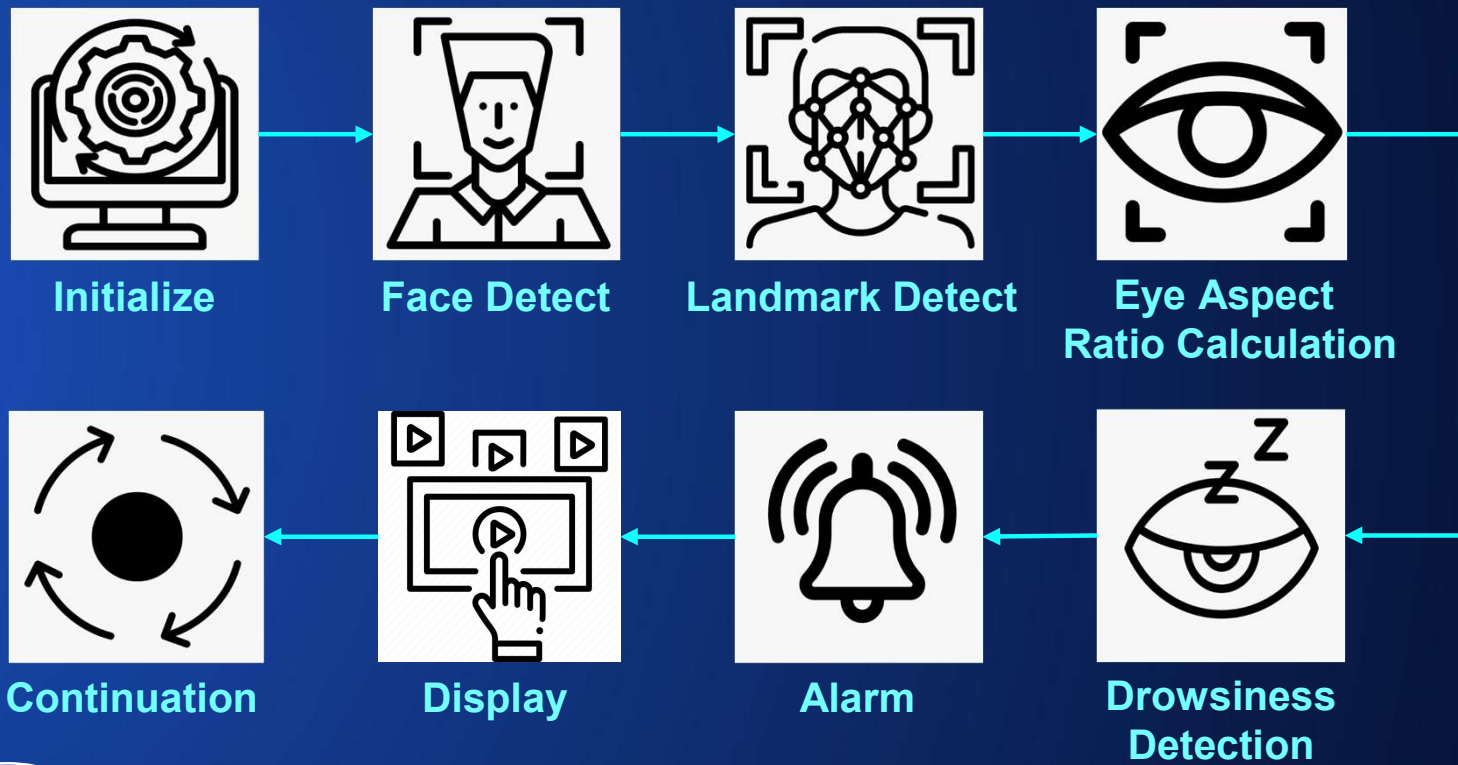
### Facial Landmarks



### Eye Aspect Ratio (EAR)



## 3.2. The algorithm behind the code





04

# TESTING AND EVALUATIONS

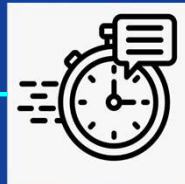
## 4.1. Testing driver monitoring system

### Testing Goals:

Accuracy



Responsiveness



Robustness



### Testing Methods:



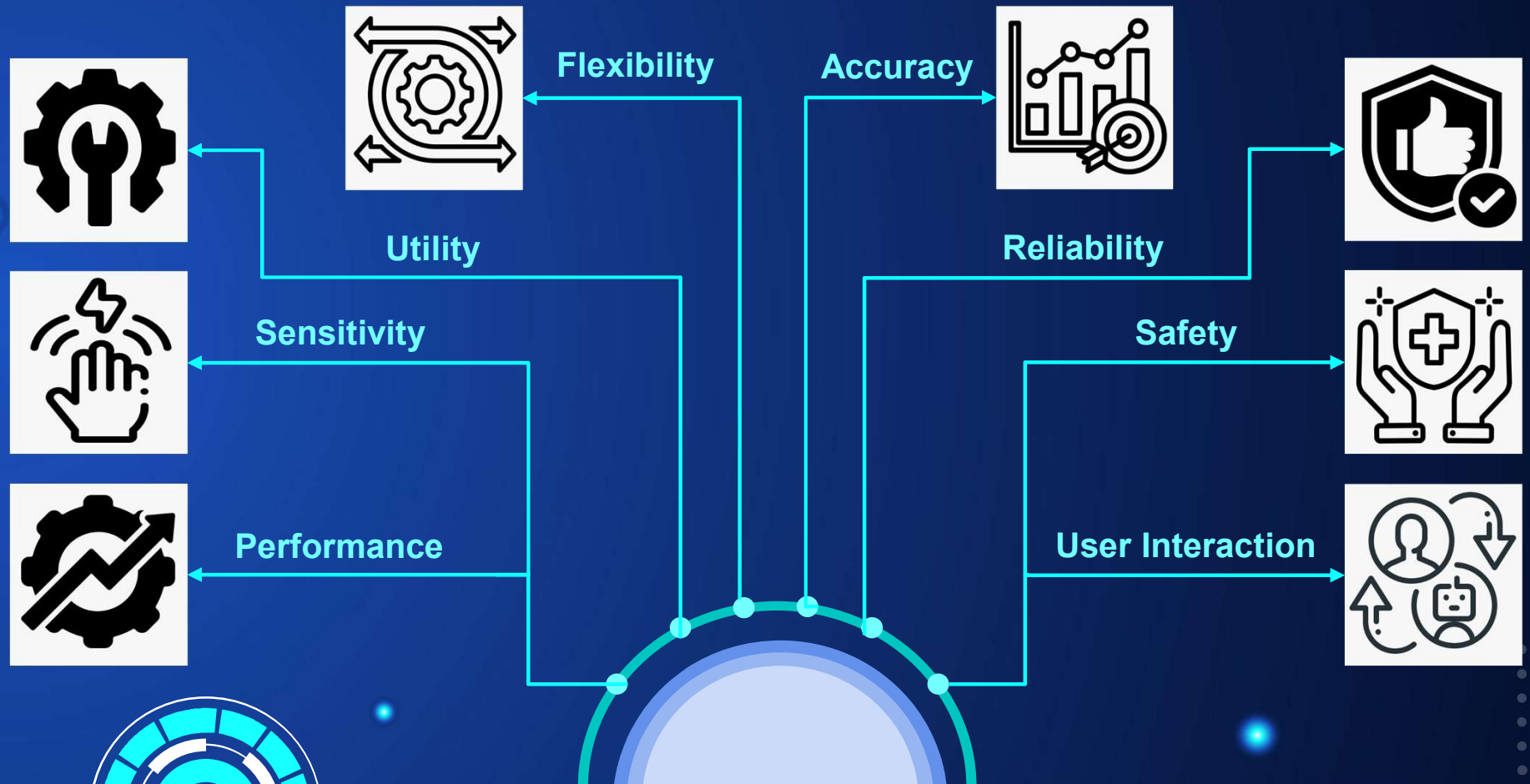
Data Collection



Data Analysis



## 4.2. Driver monitoring system evaluations







05

CONCLUSION

## 5. Conclusion





# THANKS FOR WATCHING

DRIVER MONITORING SYSTEM  
Special Project (EL)

