



POLITEKNIK SULTAN SALAHUDDIN ABDUL AZIZ
SHAH

FINAL REPORT

BLIND-SPOT ALERT SYSTEM

STUDENT NAME:	NURUL NADIRA BINTI MOHD ZAMRI
MATRICES NUMBER:	08DEP20F1019
COURSE NAME:	Diploma in Electronic (Communication)
DEPARTMENT:	Department of Electrical Engineering
COURSE CODE:	DEE50102 – PROJECT 2
SUPERVISOR:	PN ANNAFAEDZATUL BINTI MOHAMAD AMIN

CONFIRMATION OF THE PROJECT

The "BLIND-SPOT ALERT SYSTEM" project report has been submitted, evaluated, and confirmed as meeting the conditions and specifications of the Project Writing as specified.

Checked by:

Supervisor's Name: Puan Annafaedzatul Binti Mohamad Amin

Supervisor's Signature:

Date:

Verified By:

Project Coordinator Name:

Signature of Coordinator:

Date:

DECLARATION

I hereby declare that the work in this report is my own except for material used from other sources has been clearly identified and properly acknowledged and referenced.

Signature: 

Name: Nurul Nadira Binti Mohd Zamri

Registration No.: 08DEP20F1019

Date: 20 December 2022

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ABSTRACT

Road accidents can happen if you neglect the blind spots when driving. As a driver, you need to identify the blind spots to avoid any untoward incident. There is the case involving motorist and lorry that accident because of the lorry driver could not see the motorist from the front blind-spot area. A child left unattended in a car can suffer the fatal effects of heat stroke in just 15 minutes. Also in February 2020, a baby girl died of heatstroke after she was left for 4 hours in the back seat of a multipurpose vehicle. It happen because of the father forgot and did not notice that he should send his daughter to the nursery. The purpose of this project is to develop a blind-spot detection device by using ultrasonic sensor and to design a software that can alerting driver by using wifi. The ultrasonic sensor will sense any object that pass near the sensor. Meanwhile the pir sensor will detect the heat and motion inside and outside the car. This two sensor will alert and send the data to raspberry pi. We used raspberry pi to send the notification or alert the user using wifi module and application.

1.0 INTRODUCTION

On 2022 there is a case involving motorist and lorry that accident because of the lorry driver could not see the motorist from the front blind-spot area. The lorry driver failed to avoid the victim and hit them. It cause they died in the accident during changing the tyre at the roadside. A volvo car already have this feature on their car but they is so expensive. So we decide to made the blind-spot detection but in the affordable price. Other than blind-spot detection, our project also about child left in the car. There is so many cases about child died in the car due to their parents forget about their children. For example, at Kuantan there is case about nine month old girl died of heatstroke because the father was forget to send his daughter to the nursery and go straight to the work. From the analysis data that we get through our need analysis survey using google form is most of the respondent aware about blind-spot area but sometime they also find that they cannot see other vehicle at the blind-spot area. They also agree that if this system exist it can facilitate the driver so they interested to install this system at their car. From analysis survey we also know that most of the parents often bring their child anywhere and sometime they also forgotten about their child.

1.1 PROJECT BACKGROUND

A blind spot is an area of the road outside the driver's field of vision that cannot be seen in the rear-view mirrors or through the windows. Blind spots are all around vehicles, but their size and location vary according to the type of vehicle. The main blind spots are located in front, at the rear, on the sides and behind the windshield pillars of the vehicle. So from this problem we think that we want to solve this problem so it will be easier to all people.

Other than we not only doing about car blind spot we also do project about child detection. A child was found death due to heatstroke after she was accidentally left by her father in his parked car in Kedah (Kuala Lumpur, 2020). A total of six deaths involving children who were accidentally left behind in vehicles have been reported in the country since 2018 (Dewan Rakyat, 2020). Besides that, a nine month baby was died due to heatstroke after being left in the car for four hours by her father that is forgotten to send her to nursery (Kuantan, 2020). Negligence like this can invite danger to children in turn capable of threatening their lives.

1.2 PROBLEM STATEMENT

On 2022 there is a case involving motorist and lorry that accident because of the lorry driver could not see the motorist from the front blind-spot area. The lorry driver failed to avoid the victim and

hit them. It cause they died in the accident during changing the tyre at the roadside. Other than blind-spot detection, our project also about child left in the car. There is so many cases about child died in the car due to their parents forget about their children. For example, at Kuantan there is case about nine month old girl died of heatstroke because the father was forget to send his daughter to the nursery and go straight to the work. So from this cases we found that driver has difficulty to noticing another vehicle at blind-spot area and parents forget about having their child in the car and leaving them in a car with the engine is off.

1.3 OBJECTIVES AND AIMS

This project was to develop a blind-spot detection by using ultrasonic sensor and to design a software that can alerting driver by using wifi. Our aims is to help people that is having difficulty to notify vehicle at blind-spot detection. Other than that, our is also to remind the parents that bring their child that they left their child in the vehicle.

1.4 PROJECT SCOPE

Our project scope is for the driver that is does not have blind spot alerting system in their car. So with the existence of this system people can put this system in their car. So there will be no more problem about does not see any vehicle in blind spot area. Other than that, our project scope also for parents vehicle that does not remind them that their child was being left in the car. After put this system in the parents car, parents will be more alert about either their child in the car or not. So they will not forget about them again.

1.5 IMPORTANT OF PROJECT

Significance of our project is to help people that having difficulty to notify vehicle at their blind spot area. So with this system the driver will be more alert about the whereabouts of other car at the blind spot area that they cannot see. So with this system we also can avoid the thing that we don't want to happen such as accident. Other than that, the significance of this project is to remind parents that they bring their child during outing. There is so many issues about child died in the car due to the parents forgotten that they have their child in the backseat of the car. So with this system we can overcome the problem so the parents will always remember about their child through the application that is being download at their own phone.

2.0 LITERATURE REVIEW

2.1 INTRODUCTION

Fadzly hanaffi reported that in Johor the trailer crashes into car at junction after failing to see vehicle in its blind spot. Half of the car was come under the trailer was the causes of the accident. Other than blind-spot, child left in the car was another cases. At Johor Bahru a cases was reported to the police according to the child left in the car unintentionally by her grandmother. Just because the grandmother forgot her granddaughter in the car for a few hours, it bring to the death of the child.

2.2 LITERATURE REVIEW BLIND-SPOT ALERT SYSTEM AND CHILD ALERT SYSTEM

This chapter expands on the literature evaluations that provide information in line with the project's choice of a blind-spot alerting system and child alerting system as its technique. The obtained pertinent data is listed below.

AUTHOR	METHOD	SOLUTION
Detecting Blind Spot By Using Ultrasonic Sensor T. S. Ajay and R. Ezhil	The system is based on Arduino microcontroller. The system consist ultrasonic sensor, motor IC, DC motor. The obstacle when detected in the blind spot, the data is acquired by ultrasonic sensor HC-SR04 with a specified range and then it is fed to the input for Arduino mega 2560. The ultrasonic sensor measures the time difference of the obstacle in the vicinity of the vehicle and then	developed system that detects blind-spot area and then controls the speed of the individual motors connected to the axial of the wheel. The vehicle is fitted with four sensors to check the front, rear, and the two side of the automobile. When an obstacle is detected on the blind spot area, the distance of the obstacle is calculated and fed to the Arduino Mega to process the necessary action. The ultrasonic sensor HC-SR04 provides 2cm - 400cm

	calculates the distance with time. Then the data is manipulated to control the motors and to reduce the speed of motor by specified amount.	measurement range, the accuracy of ranging can reach to 3mm.
<p>Vehicle Collision Avoidance System by Blind Spot Monitoring and Drowsiness Detection in Automobiles</p> <p>G. Rishetha, M. Tech Student, CVR College of Engineering/ECE Department, Hyderabad, India and S. Sailaja Asst. Professor, CVR College of Engineering/ECE Department, Hyderabad, India</p>	<p>The system uses the ultrasonic sensors around the vehicle to detect the incoming obstacle in the specified range and sensor feedback is given to the raspberry pi microcontroller as to give the image of the vehicles to the driver, and warn by giving buzzer sound.</p>	<p>designed a system to detect the obstacle from distance and the presence of the driver while driving is observed to take preventive measures to avoid accidents. The blind-spot monitoring is made at night times using night vision camera to capture obstacle at night time. The drowsiness detection could be extended as security system using the face detection technique in MATLAB software.</p> <p>This paper also using high efficiency GSM and GPS modules. We can find the location of particular object through SMS, so that sometimes we can easily identify the object time and place easily. And also by adding multiple sensors (like metal and obstacle sensors) to the system, we can use this moving robotic arm as multifunctional system used for finding the metal objects or bombs, further we can auto control robotic arm using obstacle sensor.</p>

<p>Vehicle Blind Spot Monitoring Phenomenon using Ultrasonic Sensor</p> <p>Adnan, Z., Hassan, M. Z., Ab Wahab N., Najib, S.M., Nasir, N.S</p>	<p>m. Components selection is the main role in constructing an inexpensive blind spot detection system in the present work. Thus, Arduino UNO R3 model and HC-SR04 ultrasonic sensors were employed for the VBMS system due to reasonable market price. Plus, the ultrasonic sensor has demonstrated a remarkable performance in the past blind spot detection system application. Concerning easy installation as well as maintenance on any vehicle, the VBMS is designed as a compact device which assembles the main control unit and sensory part in a single body to be located at the bottom of the side mirror. Meanwhile, the hazard-warning signal is separately located at the passenger compartment for easily visible by the driver. The angle and sensing range of sensors are both adjustable but vital as their projections define the blind spot limit accurately by</p>	<p>developed The Smart Vehicle Blind-Spot Monitoring System (VBMS) as a vehicle safety feature in order to improve the awareness among drivers regarding the presence of hazard around their vehicle. VBSM had been made in simple component system configuration, consisting a single control unit that combines two component functions collaborating with each other. The procedure of device development was done carefully according to sequence for software to hardware components. Hence, no flow or skipped step happened until the final stage of production. The software system performed real-time processing without lagging sue to fever components involved, plus the sensing distance adjustment was very practical via IDE software to be equipped on different vehicle sizes. The best suitable sensor chosen had provided true information for the driver in various speed and vehicle conditions tested during the day and night time.</p>
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	characterizing low to a high potential hazard.	
<p>Real-time approaching vehicle detection in blind-spot area</p> <p>C.T. Chen, Y.S. Chen</p>	<p>Detecting objects (including all kinds of vehicles, bicycles, and pedestrians) accurately and efficiently is an essential issue in blind-spot information system (BLIS). To meet these requirements, this paper presents an image-based method to detect approaching objects in blind-spot area and proposes a verification method by using the recorded video database from real traffic environment. By taking video frames and converting the images into one dimensional information, the image entropy of the road scene in the near lane are estimated. Thus, by analysis the lane information, an object will be detected and located in a constant time. This idea has been realized and implemented on low-cost DSP platform developed by Automotive Research and Testing Center (ARTC,</p>	<p>developed a system and was verified by using video database of Blind-Spot area, including three road situations and four weather conditions. The system accuracy is more than 91.01% and the mean distance of warning area is about 8.1m. The result are satisfied to the system specification and show the algorithm is excellent for approaching vehicle detection of vehicle imaging system. An image process method to detect the motion object. The 2D data of a road image is transferred to 1D lane information by using the estimation of image entropy firstly, and the possible vehicle position is determined by using the differentiation process. Moreover, the position of approaching vehicle is determined by the information of two lanes extracted from the images of time series</p>

	<p>Taiwan). The accurate rate of this blind-spot detection system (BDS) is 91% and the frame rate is more than 20 frames per sec (fps), in day and night and all weather conditions. The BDS has been applied for general vehicles and heavy truck vehicles nowadays</p>	
<p>Semi-Truck Blind Spot Detection System</p> <p>Abhijith Santhoshkumar, Aris Socorro, David Sheets, and Neel Sheth Dept. of Electrical Engineering and Computer Science, University of Central Florida, Orlando, Florida</p>	<p>The Truck Smart Blind Spot Detection System was designed to solve this issue. The system consists of two parts: one display hub unit and three sensor units. The sensors are to be strategically placed in key locations around the outer body of the truck. The hub can be seated in the cabin in a location that is most convenient to the driver. While the system is on, the sensors will continuously send data to the LED display unit. When a sensor senses an obstruction in its region, the corresponding LED will turn on warning the driver that</p>	<p>developed a system that wireless, portable , sensor-based system, an LED display, alerts the driver when a vehicle or a pedestrian is occupying their blind spot. This system provide an inexpensive way to prevent accidents caused by limited line of sight in large vehicles. The system is made portable so that it can be changed from trailer to trailer. This system is designed to work with all different models and sizes of trucks and, if implemented widely, can drastically decrease the number of truck related road crashes.</p>

	<p>the region is occupied. If all the LEDs are off, it can be determined that all the areas are clear and it's safe to change lanes if needed.</p>	
<p>IOT Based Smart Life Saver System for Kids and Objected Tracking</p> <p>Diaa SALAMA ABD.ELMINAAM, Rasha ORBAN, and Fatma SAKR</p>	<p>Kids and object tracking system by GSM uses Arduino powered by battery, as Arduino is the mastermind and organizes all the system processes. It is connected to sensors (X, Y types). The sensor knows the state of the body for its Pitch or Roll; also it exists in the system connection between Arduino and Smartphone are made by a device called See Shield Interface which transfer and translate information from the smartphone to Arduino and vice versa. It also helps the child ask for help by sending SMS with the location in the message. The energy needed by the device ranges from 9-12 volts to a small battery that gives Arduino energy to work, and Arduino feeds its sensors.</p>	<p>developed a real-time tracking for locating missing children based on IoT. The study aims to child tracking and monitoring system based on GPS, GSM, GPRS modules and Arduino. The proposed system allows tracking children using the application of the IOT and identifying the coordinates of their locations in real time and at any place to protect them from losing or kidnapping by exploiting the IOT's technologies. solution takes advantage of smartphones, which offers rich features like Google maps, GPS, SMS, etc. The microcontroller used in the proposed method (Arduino MEGA 2560 With WiFi Built-in - ESP8266) .its official price is not high, available for more customers. In the future, we aim to resize it and increase the number of sensors and determine a specific zone for children. It sends a random SMS when the child or the object moves far from its zone. The results show the superiority of the propsed solution over other solutions.</p>

2.3 SUMMARY

From the research paper that we get, for the blind spot we will use ultrasonic HC-SR04 for the sensor that will be use at the car. The range of this type of sensor is 2cm until 400cm and the accuracy is 3mm. And for human detection we will use pir sensor because pir sensor is a sensor that is specification for human detect. Other than that, most of people using Arduino it is because Arduino is more easy to use it but some of it using raspberry pi. So we decide to use raspberry pi because raspberry pi is more detail for it component than Arduino. Lastly, for the ouput most of the paper that I doing research is using GSM or SMS to the phone. But for our project we decide to use application to put more IOT in our project. The application will be more easy for the user because it is all in the apps already.

3.0 METHODOLOGY

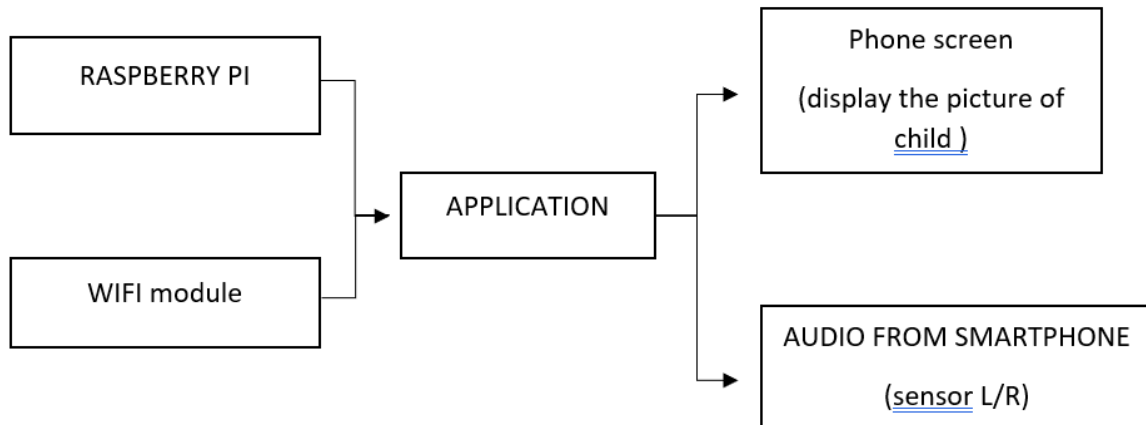
3.1 INTRODUCTION

Our research method is the ultrasonic sensor will sense any object that pass near the sensor. Meanwhile the pir sensor will detect the heat and motion inside and outside the car. This two sensor will alert and send the data to raspberry pi. We used raspberry pi to send the notification or alert the user using wifi module and application. Our project power supply is use dc motor driver, L239D pic and 9V battery. The battery will provide 9V throught the pic to the motor. The pic will provide only 3.3V or 5V supply to the raspberry pi so the raspberry pi will not overload.

3.2 PROJECT DESIGN AND OVRVIEW

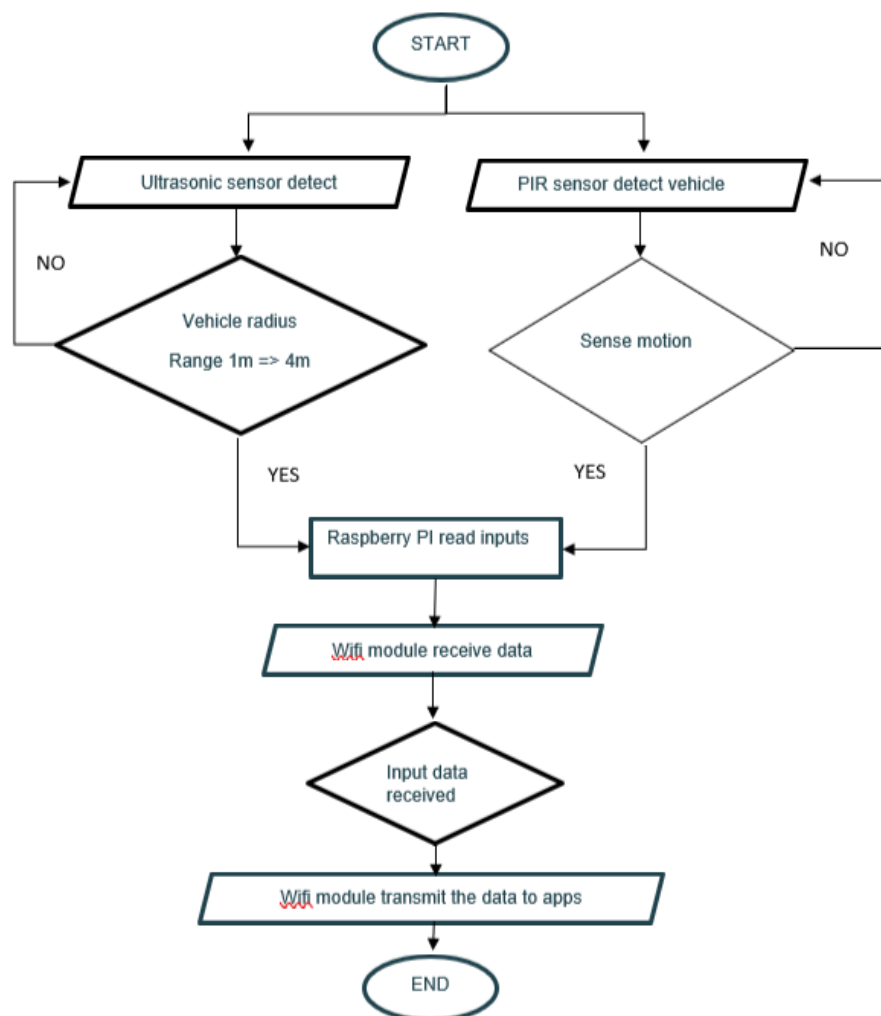
3.2.1 Block Diagram of software Project

This is software block diagram that we already figure out about this project



3.2.2 Flowchart of software Project

This Is project software flowchart that we want to do for this project.



From this flowchart, we can see that this project software input data or get the date from both sensor that we use which is ultrasonic sensor for noticing vehicle and PIR sensor is for noticing a person or child presence. The data will transmit to wifi module from raspberry pi and then from wifi module the data will be transmit to the app and after that the user will get the notification from the app that we will build.

3.2.3 Project Description

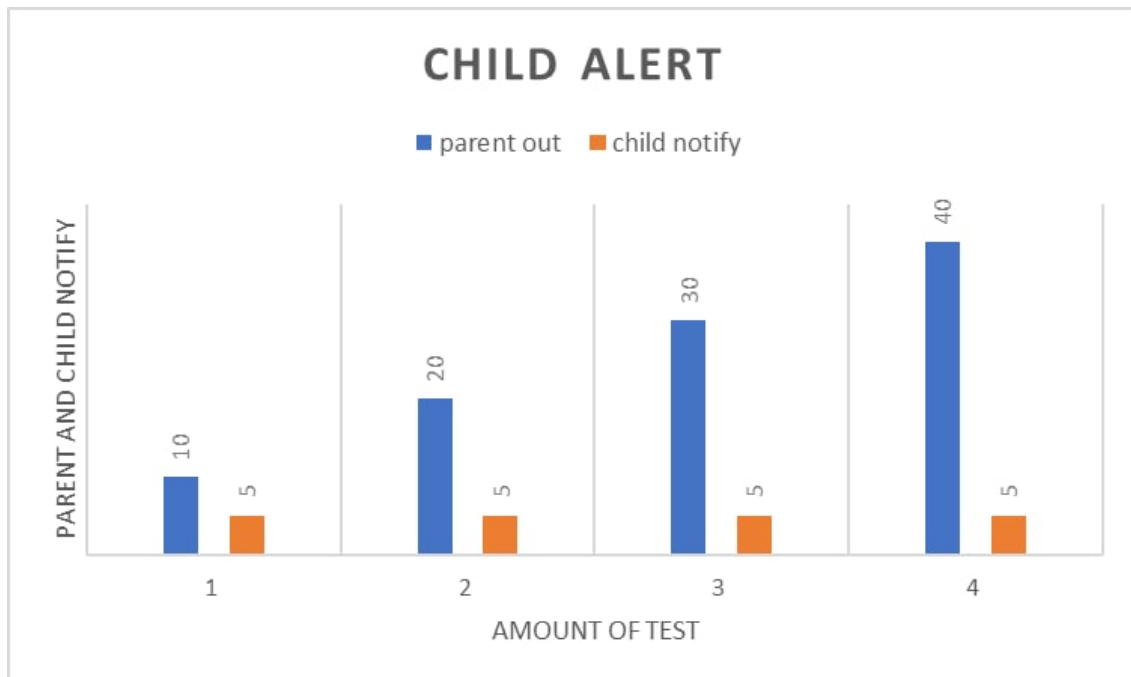
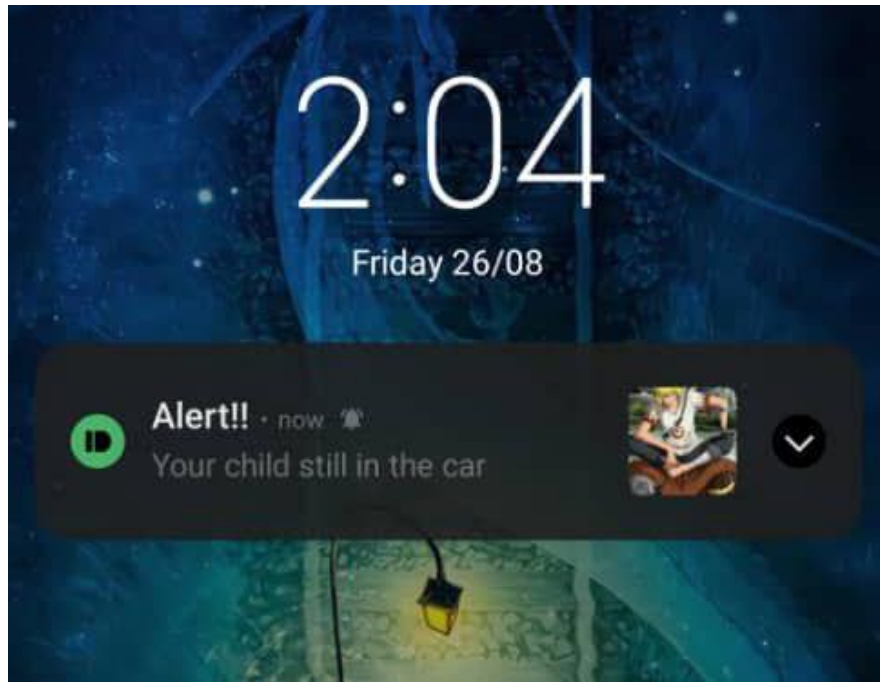
from the block diagram we can see that this project input is power supply, ultrasonic sensor and pir sensor. The ultrasonic sensor is for vhilcle detection and distance measurement that will be place at left and right of the car. It same goes for the pir sensor but the pir sensor function is to the detect human that will be inside of the car. After that all this input will be goes to the raspberry pi which is an intermediary between the input and output. So the input that goes to the raspberry pi will go the that application using wifi module. Sp from here we can see that the output for this project will be application.

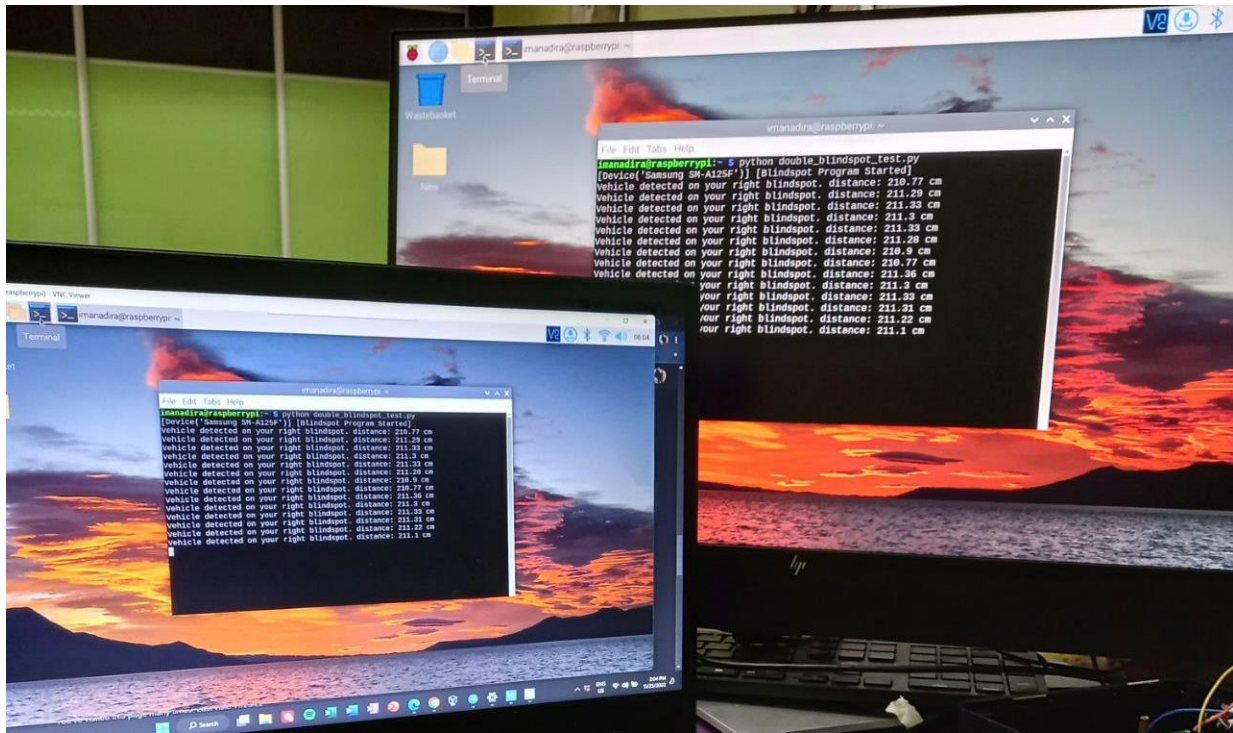
3.3 Summary

So for our project we does not doing it finish yet because we more focus to the mini project that we are doing right now but all the preparation we already doing it such as the component that we wil be using. So for the hardware part of this project the main we will use the ultrasonic sensor, pir sensor and raspberry pi. For the other part that we use is dc motor, battery and wifi module.

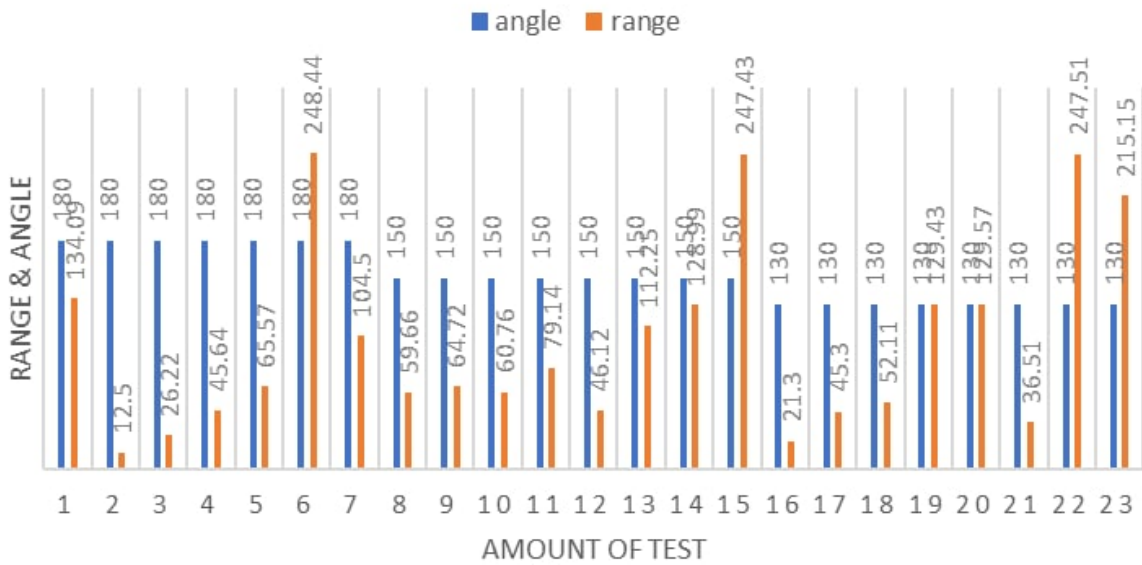
4.0 EXPECTED RESULT

our project expected result is the ultrasonic sensor will detect the vehicle that past by the detection area of the sensor and PIR sensor will detect child that was inside of the car so these two sensors will be input to the raspberry pi and the raspberry pi will send the signal to the application through wifi module. The application will send the notification to the driver of the car through the apps that will be install in the owner of the car phone. The ultrasonic sensor will just send the notification to the phone meanwhile the pir sensor will send notification of the child at the application.





BLIND-SPOT ALERT

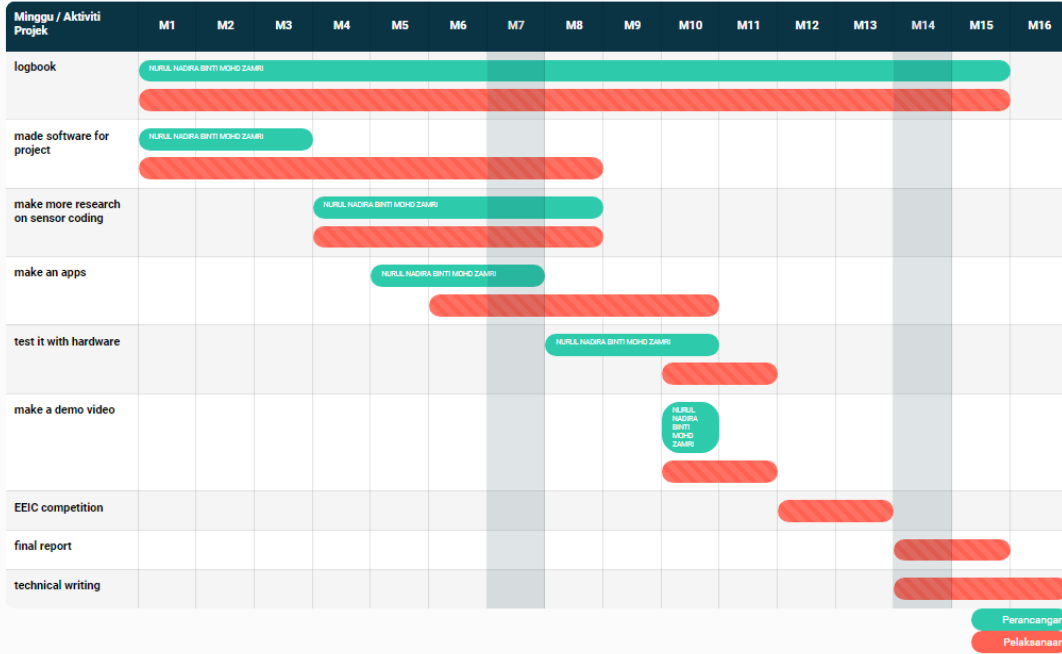


APPENDICES

APPENDIX 1: GANTT CHART

CARTA GANTT : PERANCANGAN DAN PELAKSANAAN PROJEK PELAJAR

SESI : 1 : 2022/2023
 JABATAN: JKE
 KODKURSUS: DEE50102
 TAJUK PROJEK : BLIND-SPOT ALERT SYSTEM



APPENDIX 3: PROGRAM CODING

1. BLIND-SPOT CODING

```
#-----  
# PROJECT TITLE : Anti Blindspot Alert System  
# MEMBERS : Iman Azmi and Dira  
# INSTITUTE : Politeknik Shah Alam  
#-----  
  
import RPi.GPIO as GPIO  
import time  
from time import sleep  
from pushbullet import Pushbullet  
  
#set device details  
pb = Pushbullet("o.KCwhC0kC5Nu97uo2lXw39RpnzYOlKkJx") #put access token here  
print(pb.devices, "[Blindspot Program Started]")  
  
#pin assignment  
sensor_trig1 = 11 #pin trigger right  
sensor_echo1 = 13 #pin echo right  
sensor_trig2 = 29 #pin trigger left  
sensor_echo2 = 31 #pin echo left  
  
#set GPIO to default/initial state  
GPIO.setwarnings(False)  
GPIO.setmode(GPIO.BOARD)  
GPIO.setup(sensor_trig1,GPIO.OUT)  
GPIO.setup(sensor_echo1,GPIO.IN)  
GPIO.setup(sensor_trig2,GPIO.OUT)  
GPIO.setup(sensor_echo2,GPIO.IN)  
  
#initial state for detection  
left_state = 0  
right_state = 0  
  
def blindspot():  
    left_state = 0
```

```

right_state = 0
try:
    while True:
        PIN_TRIGGER = [sensor_trig1, sensor_trig2]
        ECHOS = [sensor_echo1, sensor_echo2]

        for e in ECHOS:
            GPIO.output(PIN_TRIGGER, GPIO.LOW)

            #print ("Waiting for sensor to settle")
            time.sleep(0.5)
            #print ("Calculating distance")

            GPIO.output(PIN_TRIGGER, GPIO.HIGH)
            time.sleep(0.00001)
            GPIO.output(PIN_TRIGGER, GPIO.LOW)

            while GPIO.input(e) == 0:
                pulse_start_time = time.time()
            while GPIO.input(e) == 1:
                pulse_end_time = time.time()

            pulse_duration = pulse_end_time - pulse_start_time
            distance = round(pulse_duration * 17150, 2)

            #NOTE: distance = 5 (5cm jarak untuk detect blindspot)

            if (e==31 and distance<=5 and distance>=2):
                print("Vehicle detected on your left blindspot.", "distance:",
distance,"cm")

                dev = pb.get_device('Xiaomi 21061110AG')
                push = dev.push_note("Vehicle detected on your left
blindspot","")

                left_state = 1
                time.sleep(2)
            if (e==13 and distance<=5 and distance>=2):
                print("Vehicle detected on your right blindspot.", "distance:",
distance,"cm")

```



```

        dev = pb.get_device('Xiaomi 21061110AG')
        push = dev.push_note("Vehicle detected on your right
blindspot", "")

        right_state = 1
        time.sleep(2)

    if (left_state == 1 and distance > 5):
        left_state = 0
        time.sleep(5)
    if (right_state == 1 and distance > 5):
        right_state = 0
        time.sleep(5)

    if (right_state == 1 and left_state == 1):
        print("Vehicle detected on your both blindspot")
        dev = pb.get_device('Xiaomi 21061110AG')
        push = dev.push_note("Vehicle detected on your both
blindspot", "")

        time.sleep(5)
        right_state = 0
        left_state = 0

    if (right_state == 0 and left_state == 0):
        #print("distance: ", distance, "cm")
        i = 4

    finally:
        GPIO.cleanup()

if __name__ == "__main__":
    try:
        while True:
            blindspot()
            time.sleep(0.1)
    except KeyboardInterrupt:
        print("Program Stopped")

```

```
GPIO.cleanup()
```

2. CHILD ALERT CODING

```
import RPi.GPIO as GPIO
import time
from time import sleep
from pushbullet import Pushbullet

pb = Pushbullet("o.KCwhC0kC5Nu97uo2lXw39RpnzYOIkKjX") #put access token here
print(pb.devices, "[Child Alert Program Started]")

GPIO.setwarnings(False)
GPIO.setmode(GPIO.BOARD)
GPIO.setup(36,GPIO.IN) #child pin
GPIO.setup(40,GPIO.IN) #parent pin

parent_state = 0 #parent state to check whether they have left the car
child_state = 0 #parent state to check whether they have left the car

##NOTE : The capability of this PIR sensor only able ##
##### to detect per 16s for accurate results. ##

def main():
    parent_state = 0
    child_state = 0

    while True:
        parent = GPIO.input(40)
        child = GPIO.input(36)
        if (parent == 0 and parent_state == 0):
            print("no parent motion")
            child = GPIO.input(36)
            child_state = 0
            time.sleep(0.5)
        if parent == 1:
            print("parent detected")
            time.sleep(16)
```

```

parent_state = 1
child = GPIO.input(36)
time.sleep(1)
parent = GPIO.input(40)
if (parent == 0 and parent_state==1):
    print("parents leave the vehicle")           #parent keluar kereta
    parent_state = 2
    child_state = 1           #state check whether child still in the car
    time.sleep(20)           #time for child get out of the vehicle

if child == 0 and child_state==0 or child_state == 1:
    print("no child motion")
    parent = GPIO.input(40)
    time.sleep(0.5)

if child == 1 and child_state == 1:
    print("child detected")
    child_state = 2
    #parent = GPIO.input(40)
    time.sleep(10)
    while child_state == 2 and parent_state==2:
        print("Alert!!", "Your child still in the car")
        dev = pb.get_device('Xiaomi 21061110AG')
        push = dev.push_note("Alert!!", "Your child still in the car")
        time.sleep(16)           #check whether child still in the car
        child = GPIO.input(36)
        parent = GPIO.input(40)
        time.sleep(0.5)
        if(child == 0):
            child_state==0
            parent_state = 0
            time.sleep(0.5)
        else:
            #parent = GPIO.input(40)
            child = GPIO.input(36)

```

```
def cuba():
```

```
    try:
```

```
while True:
    parent = GPIO.input(40)
    child = GPIO.input(36)
    print("parent:", parent, "child:", child)
    time.sleep(16)

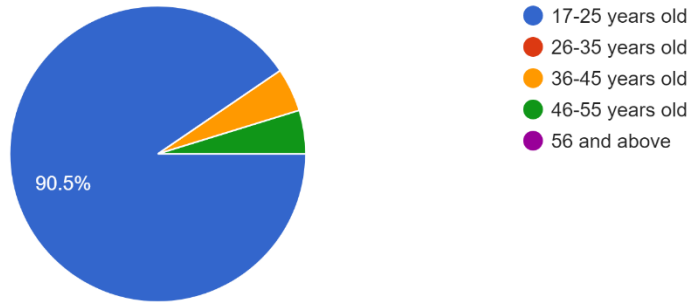
finally:
    GPIO.cleanup()

if __name__ == "__main__":
    try:
        while True:
            main()
            #cuba()
    except KeyboardInterrupt:
        print("Program Stopped")
        GPIO.cleanup()
```

APPENDIX 4: QUESTIONNAIRE

Age

21 responses



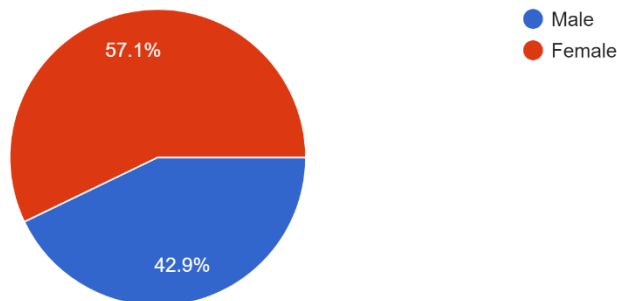
17-25 YEARS OLD - 90.5%

36-45 YEARS OLD – 4.8%

46-55 YEARS OLD – 4.8%

Gender

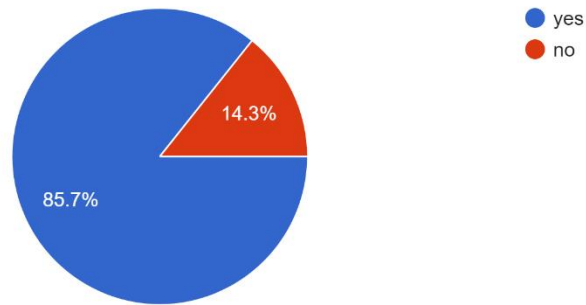
21 responses



FIRST SECTION – BLIND-SPOT ALERTING SYSTEM

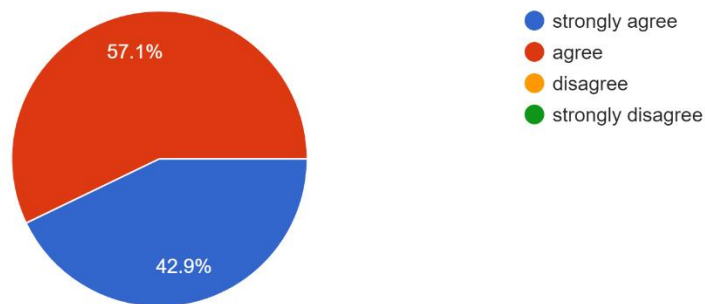
Do you have any vehicle ?

21 responses



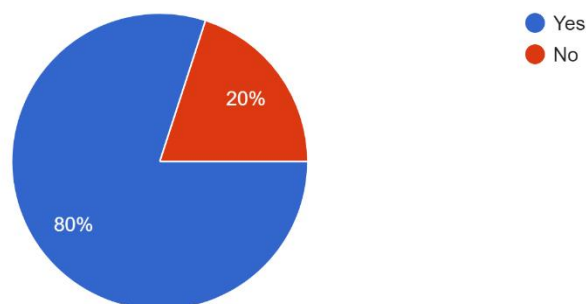
Do you find that sometime you cannot see other vehicle at the blind-spot area?

21 responses



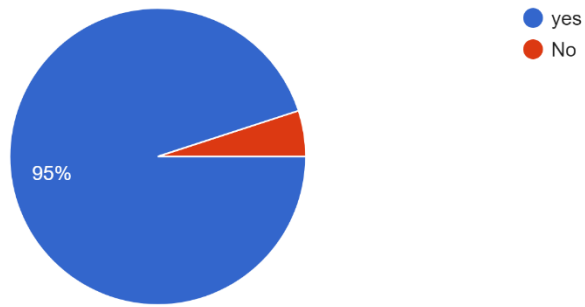
Do you aware about blind-spot area?

20 responses



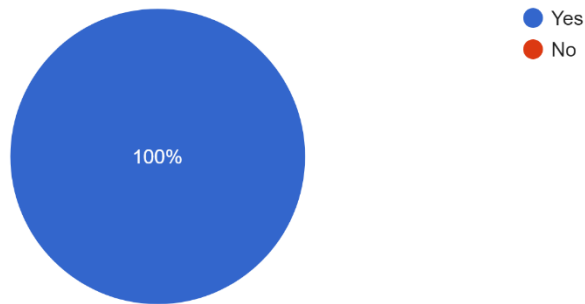
If this system exist does it facilitate the driver ?

20 responses



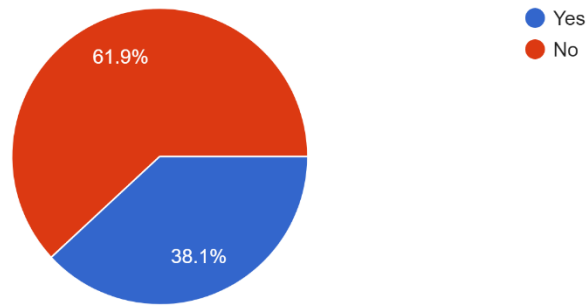
Do you interested to install this system at your car?

21 responses



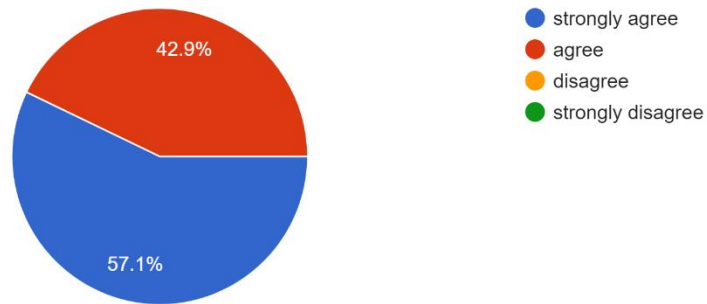
Have you ever accident because you did not realized the car at blind spot area?

21 responses



Does blind-spot alerting system very useful nowadays?

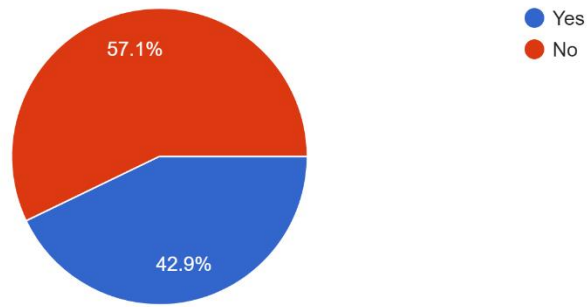
21 responses



SECOND SECTION – CHILD LEFT IN THE CAR DETECTION

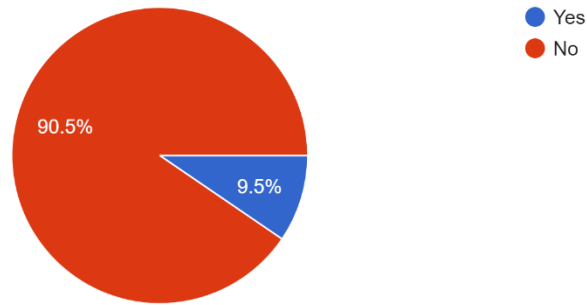
Do you often bring your child anywhere

21 responses



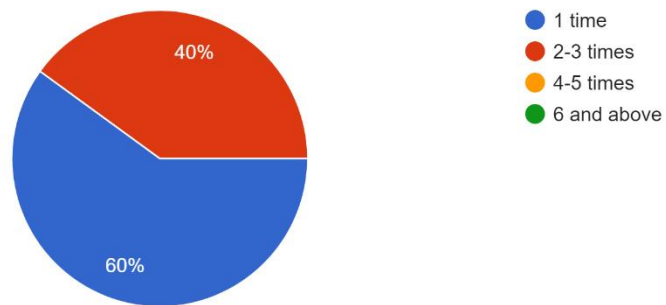
Have you ever experience leaving and forgot your child inside your car ?

21 responses



If yes , how many times you left your child inside the car ?

5 responses



SUGGESTION

Suggestions for improvement " Blind-Spot Alerting System"

4 responses

Nope

Do it for community

strengthen the car safety system. improve security sensors for blind spot car

Can connect with your phone

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