The German University in Cairo (GUC)
Faculty of Media Engineering and Technology
Computer Science and Engineering
Embedded System Architecture - CSEN 701

Basic Vehicle Anti-theft System

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Team # 1

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Chapter 1

Hardware Components List

1.1 Sensors:

Only Two Sensors Due to us being able to Create a connection with the Wifi using ESM-01 Module and are interacting with Wifi ,

<GPS sensor (Ublox NEO-7M)>
<Vibration Sensor (Analog)>

The first one,<GPS Sensor>, will be crucial for us since it will enable us to track the location of the Vehicle and detect if it has left the predefined area .

The second one,<Vibration Sensor>, is the Analog Sensor of our project which is essential to detect tampering if someone tries to physically move the vehicle the vibration sensor detects the movement or vibrations caused by this interference.

1.2 Actuators:

Four Actuators However we also have created an website that both outputs vehicle's status and allows you to modify vehicle's status

<Motors (Uses PWM)>
<Buzzer (Uses PWM)>
<Led>
<GSM (SIM900A)>

The first one,< Motors>, is crucial for us as it will allow us to control the movement of the vehicle

The second one,<Buzzer>, will sound an alert upon either the GPS sensor or Vibration Sensor sending a signal

The Third one,< Led>, will blink upon either the GPS sensor or Vibration Sensor sending a signal

The Fourth one,< GSM>, will send SMS message to the User as an Alert upon either the GPS sensor or Vibration Sensor sending a signal

1.3 Board:

<Raspberry Pi Pico >

1.4 Project Body:

<Robot Platform 4 Gear Motors and Wheels >

1.5 Additional Components:

<H-Bridge (controls motor direction electronically)>

Chapter 2

Proposal

2.1 The Idea:

Through Our User InterFace (The Website)

The User Can Update The Status Of the Car to Either Locked or Unlocked

When The Car is Unlocked The Car Can Move Around Freely And Be Tampered With

Without Their being An Alert Sounded nor a Notification Sent or Led Blinking

However When The Car is Locked And It Either Moves Out Of The Predefined Area Or Is Tampered With

Through The Buzzer An Alert is Sounded and Through The GSM A Notification Is Sent To User

And Lastly The Led Blinks.

Chapter 3

State Flow Model of the Anti-theft System

3.1 State Flow Model

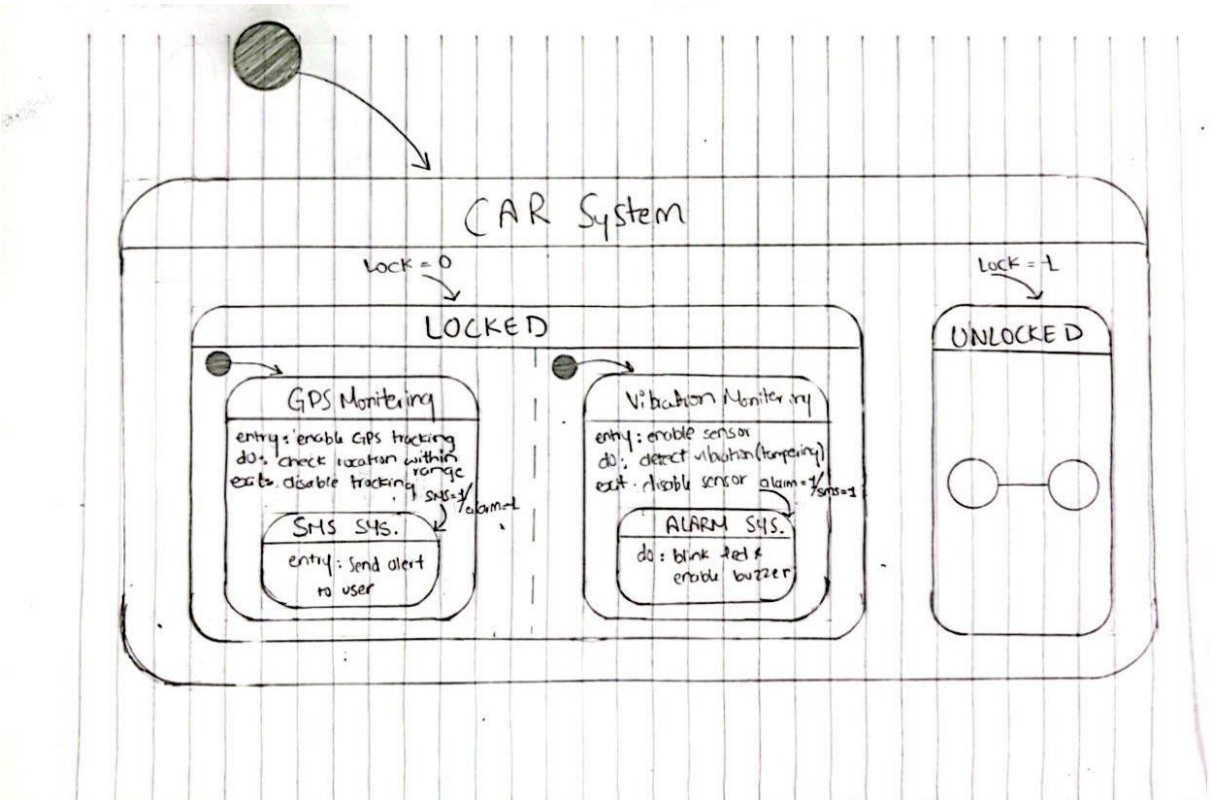

Figure 3.1 – State Flow Model of the Anti-theft System