Ahsanullah University of Science & Technology
Department of Computer Science & Engineering
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CSE 3216
Microcontroller Based System Design Lab

Project Proposal

Project Name: *Smart Car*

Submitted To

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Objective

There is no doubt in the fact that in today's times, technology has made our lives quite easy and simultaneously efficient as well. And people have been using it for benefiting themselves in numerous ways, isn't it so? For example, with the use of smartphones to even the use of cars we can achieve so much and get things done in a very short span of time. The transportation systems around which the modern world has been built are on the verge of a significant transformation. New transportation technologies are emerging to meet these challenges, including connected and autonomous vehicles, alternative fuels, keyless fleet management and traffic analytics, as well as local zoning and planning policies that support transit-oriented development. New technology for on-road communications will dramatically change how vehicles operate and provide information and capabilities for better, real-time traffic management if the necessary network infrastructure is in place.If we start to integrate modern technology into our transit operations in order to keep up with user demand and create a more user-centric approach to operations, it'll be more beneficial for us. The advantages of making this transition can lead to positive change that can take operational efficiency to the next level.

Social Values

With the help of advanced technology, we can create definitive change to our transportation system. We can eliminate the cumbersome burden of manual entry. Following the procedures, we can expect that the project under our proposal will hold some values for society till some length. In our project we are trying to pair our transport with route optimization system. It is very natural to face a foggy weather during driving, even sometimes the transport is to be driven on darker roads. There comes a question of safety. If we use a system which can detect obstacles during driving, we can reduce accidents to some extent. This is what we are going to try in our project. When the transport will be able to optimize the route while driving it'll be easier for the drivers to improve customer satisfaction metrics. And it'll also reduce accident rates. A specific type of automotive engine damage occurs when water enters the engine. A damage sequence called hydrostatic lock in which water entering a typical automotive engine cylinder during the intake stroke. Water, unlike the fuel/air mixture, is incompressible and during the compression stroke, locks the piston. This condition tends to overload the connecting rod, causing a bending failure of the rod and severe engine damage. A common way for water to enter

the engine is driving through water sufficiently deep to allow injecting into the air intake system of the vehicle, such as crossing flooded roads. To solve this problem, we are trying to use a system which will measure the water level in the road and will give a alarm if it's dangerous for the car to go ahead. We will use a temperature detector which will measure the temperature whether it's too hot or too cold or moderate. It will make our transport more user friendly.

Required Components

These following parts and tools are required for building this project

- ARDUINO MEGA

- MOTOR DRIVER

- LIPO BATTERY

- PIECE BOARD

- WHEEL

- DC MOTOR

- ULTRASONIC SENSOR

- NCP15XH103

- 3WATT10K

- NE555

- LM016L X 2

- EC-1VF1C105Z CAPACITOR

- POT-HG

- LED

- RESISTOR

- SW-DPST

- TIP31

- BUZZER

- Male to Male, Female to Female and Male to Female wire

Design

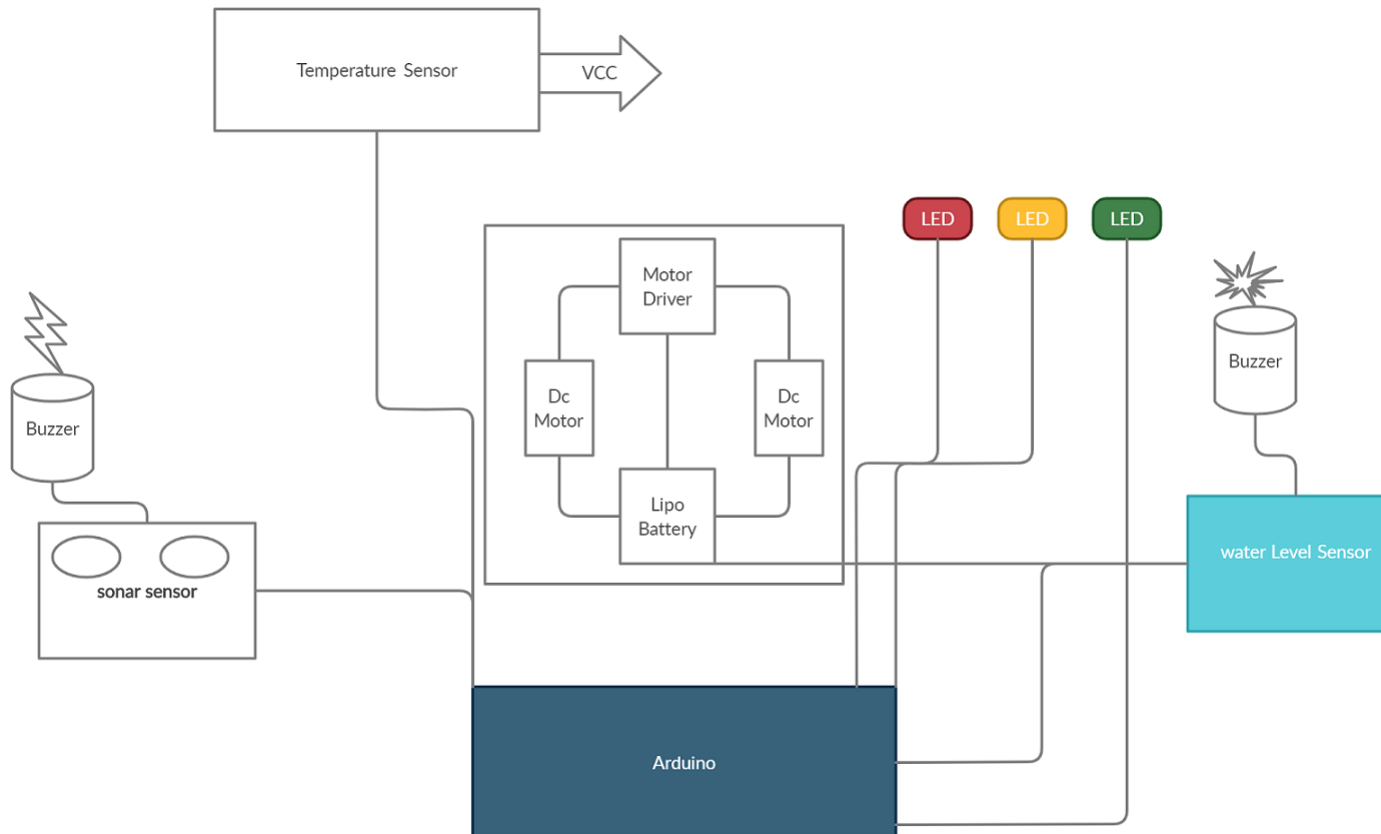The proposed block diagram is given below.

Figure 1: Diagram for Smart Car

Working Procedure

The basic components that react to the input are

- Left motor

- Right motor

- Motor driver

The components that take stimuli from the environment is

- Ultrasonic Sensor

- Water-level checking sensor

- Temperature sensor

- LEDs

- Buzzers

By pressing the UP button the car will go forward. Then the both motors will go forward in a constant speed. By pressing DOWN button the car will go backward. Then both the motors will go backward in a constant speed. By pressing RIGHT button the car will turn at right. Then the right motor will be stopped and the left motor will go forward at a low speed. By pressing LEFT button the car will turn at r. Then the left motor will be stopped and the right motor will go forward at a low speed. When the Sonar sensor detects an obstacle then it will notify the user by ringing a buzzer. It will also show the distance. When the car will be fallen in a trap , then the Water-level sensor will check whether the water touches the engine or not. If it touches the engine then it will notify the user. The temperature sensor will measure the temperature inside the car and notify the user. If the temperature is too low then it will power the GREEN LED. If the temperature is moderate then it will power the YELLOW LED and when the temperature is too high the RED LED will be powered.

Estimated budget

Equipment	Quantity	Budget(Tk)
Arduino Mega	1	880
LIPO BATTERY	1	800
DC MOTOR	4	540
ULTRASONIC SENSOR	1	150
NCP15XH103	1	100
3WATT10K	2	80
NE555	2	80
LM016L X 2	4	80
EC-1VF1C105Z CAPACITOR	1	80
POT-HG	1	80
LED	3	50
RESISTOR	4	80
SW-DPST	1	80
TIP31	2	80
BUZZER	2	80
PIECE BOARD	2	80
Wheel	2	80
Male to Male, Female to Female and Male to Female wire	As required	100
Male/Female headers	As required	40
Total		**3540**

Conclusion

The evolution and development of technology has given transport companies a significant improvement in the different stages of the delivery process. Indeed, thanks to technology, logistics, which is a key element for transport companies, has evolved. The use of computers, as well as even more powerful software and technology has allowed for a better organization of transport companies. Though we propose in a small scale recurrent development upon this small idea is capable of bringing forth a great system that will soon be sustainable