

Smart BRT Sentinel Using DIP

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Abstract- Gate Logic Controller is used to control the operation of automatic boom gates and motorized gates and doors. The modules receive control signal from external devices (that is, the images processing unit, proximity sensor.) that determine the control output to the gate motor. While a vehicle is over this loop the controller will not allow the barrier to lower. The working principle of the boom barrier gate is, boom barrier is made up of pole or bar which pivoted form a fixed point to move in a vertical direction. This bar or pole allows to block access of any vehicle of even a person through an entry gate. Since boom barrier are most commonly used at check points, they are also referred to as boom barrier gate. Concept of Image Processing is the basic concept used in this project. Due to this project other vehicles (that is car, vans, etc.) entering the BRT section will be stopped. While the buses, ambulance, police vans will be allowed. These can be done completely by images processing.

Index Terms- At-mega 16; Automatic boom gate; Boom barrier; BRT lane; Buses; Digital Image processing; Reduce accidents.

1. INTRODUCTION

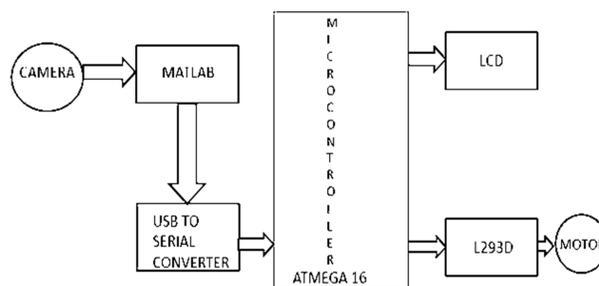
This project consist of Bus Rapid Transit that is ,BRT which is also a bus way or a transit way, a bus based public transport system which is design to improve capacity and reliability relative to conventional bus system. This system of BRT includes roadways which are completely dedicated to buses, and gives priority to bus at intersections where bus can interact with the in road traffic. This design feature is used to reduce the delay caused by the passengers who are boarding or leaving the buses, or purchasing the fares .The BRT sys-tem aims to combine the capacity and speed of metro with flexibility, lower cost and simplicity of bus system.

Boom Barrier Works as: The Boom Barrier is a Bar or Pole placed at a pivot to move and up down which helps in order to control access of vehicles in a building. It is used for both Commercial as well as residential purpose. The Operation of an Automatic Security Gate or Boom Barrier varies with respect to size, Shape and Operation. If you want to Protection for your Home or Business a boom Barrier is an added Security. It ensures that you are in control of vehicle movement within your premises. Boom Barrier makes much it harder to get in and out easily.

Boom Barrier includes various types of Mechanical Components. It can a be integrated with the help of access Control Systems such RFID, Bio-metric system which is used to automate the process of entry into premises. It restricts access to People whose Identity cannot be verified by a Smart Card, RFID Card Reader or Bio-metric Sensor. This Boom Barrier Security Gates have been designed to handle Single Door, Multiple Doors, Film Theater Security Electronic Door Lock or a Hospital Security Block System to control the entry and the

exit of Vehicles. Basically this Software also controls each and every movement with the help of its integrated Hardware as well as Mechanical Components.

2. BLOCK DIAGRAM



The camera is used for detection of devices and recognition of different vehicles from long-distances. The mat-lab programming software used to decide the correct detection of the vehicle and do the programming accordingly. The USB to Serial Converter is used for connecting the mat-lab to the controller. The images captured by matlab are send to the microcontroller using USB to Serial converter. The microcontroller is the main functioning body of the all the devices. All the connections are given the microcontroller and main decision regarding opening the gate is done by the microcontroller. The control panel consists of gear box. Limit switch, Ac motor and spring balance. All these together form one unit known as control panel. The role of gear box is speed control at a desired speed, the limit switch will be responsible for limiting the height of the boom barrier it should not exceed 90degree angle, and the ac motor is responsible for providing the necessary thrust to the boom barrier. The LCD is basically used for

displaying the message on the screen. The motor in the block diagram is used to open or close the boom barrier.

3. FLOW CHART

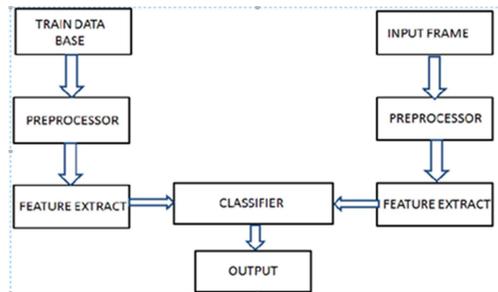


Fig.2 .Flow chart

Flow chart plays the major role in determining the flow of the project execution.

It gives the clear idea of execution of project.

It also helps in spotting the error if any in the execution process.

The flowcharts of the Smart BRT sentinel consist of:

- Basically, camera is used to detect the image of the vehicle entering the BRT section.
- This data is given to the mat-lab software through which the comparison of data is done.
- This is further given to the USB to serial converter.
- The microcontroller is used for interfacing of the components together.
- The message will be displayed by the LCD regarding the vehicle recognition.

4. CIRCUIT DIAGRAM

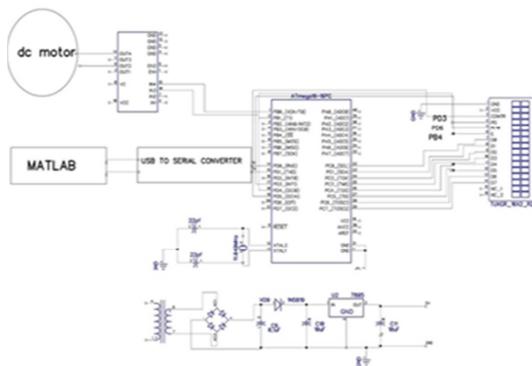


Fig.3.Circuit diagram

every power supply is used to run the circuitry which helps to complete the task of microcontroller. Energy can be obtained from various sources as per load requirement; this includes electrical energy for

transmission systems, energy required by battery or through the solar power. A rectifier is used to convert AC main supply to required DC voltage. The ripples are removed.

There may be requirement of constant output voltage, but the voltage provided by many energy sources will vary with changes in load impedance.

A constant output voltage is required in many power supply applications, but the voltage provided by many energy sources will vary with changes in load impedance.

The DC Motor must be of following features:

100RPM 12V DC Motor With Gear Box ,8 MM Shaft, Same Size Motor Available In Various RPM, 12kgcm torque, No Load Current= 500mA (max), load current = 700ma, Heavy Duty Metal Gear, Recommended for ROBOCON Events.

The Motor Driver must have following features:

supply voltage required for operation can be up to 46v, low saturation voltage, complete dc current can be up to 4A, logical "0" input voltage up to 1.5 v (high noise immunity) , over temperature protection, High operating voltage, which can be up to 40 volts.

The LCD has following features:

Slim TFT module designed for 1U rack mount equipment (2.2" TFT).IPS displays (2.4" TFT LCD, 7.0" TFT), High bright LCD displays (7.0" TFT), Resistive and capacitive touch screens (2.8" and larger TFT modules).

The camera must be of following features:

Fully Compatible with Both the Model A, Model B and Mod-el B+ Raspberry P, 5MP Omni vision 5647 Camera Module, Still Picture Resolution: 2592 x 1944, Video: Supports 1080p @ 30fps, 720p @ 60fps and 640x480p 60/90 Recording, 15-pin MIPI Camera Serial, 15-pin MIPI Camera Serial Interface - Plugs Directly into the Raspberry Pi Board the Size must be of: 20 x 25 x 9m, Weight 3g.

5. SOFTWARE USED

For creating a circuit layout or PCB layout Dip-trace software can be used .Various tutorials are provided in order to learn the software for the programmer. It is software which captures various PCB designs like single PCB, double PCB, multilevel PCB, etc.

MATLAB is a high-performance language which is used for technical computing. It helps to integrates computation, visualization, and programming in an easy-to-use environment where problems and solutions are expressed in familiar mathematical notation. Typical uses include: Application development, including Graphical User Interface building.

Schematic capture in the Proteus Design Suite is used for both the simulation of de-signs and as the design phase of a PCB layout project. It is therefore a core component and is included with all product configurations. The micro-controller simulation in Proteus works by applying either a hex le or a debug le to the micro controller part on the schematic. It is

then co-simulated along with any analog and digital electronics connected to it. This enables its use in a broad spectrum of project prototyping in areas such as motor control, temperature control and user interface design.

6. METHODOLOGY

Concept of image processing is basic concept used in this project. Due to this the other vehicles (i.e. cars, vans, etc.) entering the BRT section will be stopped. While the buses, ambulance, Police vans will be allowed. This can be done completely by image processing. The image below shows the color extraction of from RGB to grey scale image.

7. LAYOUT

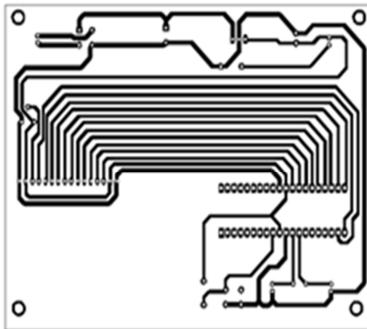


Fig.4. Layout

The layout of this is design in dip trace software using all the function described above.

8. RESULT

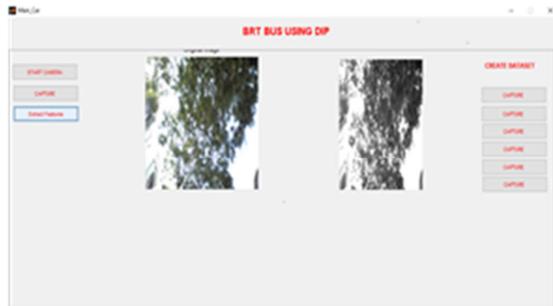


Fig.5.Result

The image below shows the color extraction of from RGB to grey scale image.

9. CONCLUSION

Hence we learnt and concluded that learning the integrated approach in engineering is the main benefit of our learning. The reduction in the wastage of human resource and proper utilization of them in other work. The project aims at reducing the accidents caused due to human error and also gives

the possibility of totally eliminating it. The project aims at providing the all weather system for operation and improves the system reliability.

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