ANDROID BASED BRIDGE PROTECTION SYSTEM BY MEASURING VEHICLE WEIGHT

AIM:

Design and Development of Android based bridge protection system by measuring vehicle weight.

PURPOSE:

There are so many kinds of vehicle safety systems around the world. Vehicle safety and road safety comes in same category. But protection of bridges also important for getting long life. Most of the vehicles carrying more weight which can cause bridge damage. Here we want to design a system that can allow vehicles if they are normal weight. To do this we have to read vehicle weight and control gate. We proposed Android based bridge protection system by measuring vehicle weight using Arduino.

DESCRIPTION:

Bluetooth (HC-05) connected to Arduino Serial port. IR sensor, Buzzer and Calibration button connected to Arduino digital pins. Load cell connected to Arduino analog pin. H-bridge (L293d) connected to Arduino digital pin and it can control DC motor which operates gate.

WORKING:

In this project vehicle will allow when it has less weight than desired limit. We can calibrate load cell weight using calibration button, if load cell shows wrong value. This calibration button works as like tare button. When vehicle comes near to IR sensor then Arduino starts calculating weight of vehicle. If weight is more than gate will not pen and information updating to Android application. If weight of vehicle less than desired value then gate will be Open. All this information displaying on 16x2 LCD display.

TECHNICAL SPECIFICATIONS:

HARDWARE:

Microcontroller   :   Arduino Uno

Crystal   :   16 MHz

LCD   :   16X2 LCD

H-Bridge   :   L293D

Bluetooth Module   :   HC-05

Motor   :   DC gear motor 10 R.P.M

Power Source   :   12v 2 amp Adaptor

Button   :   2 pin
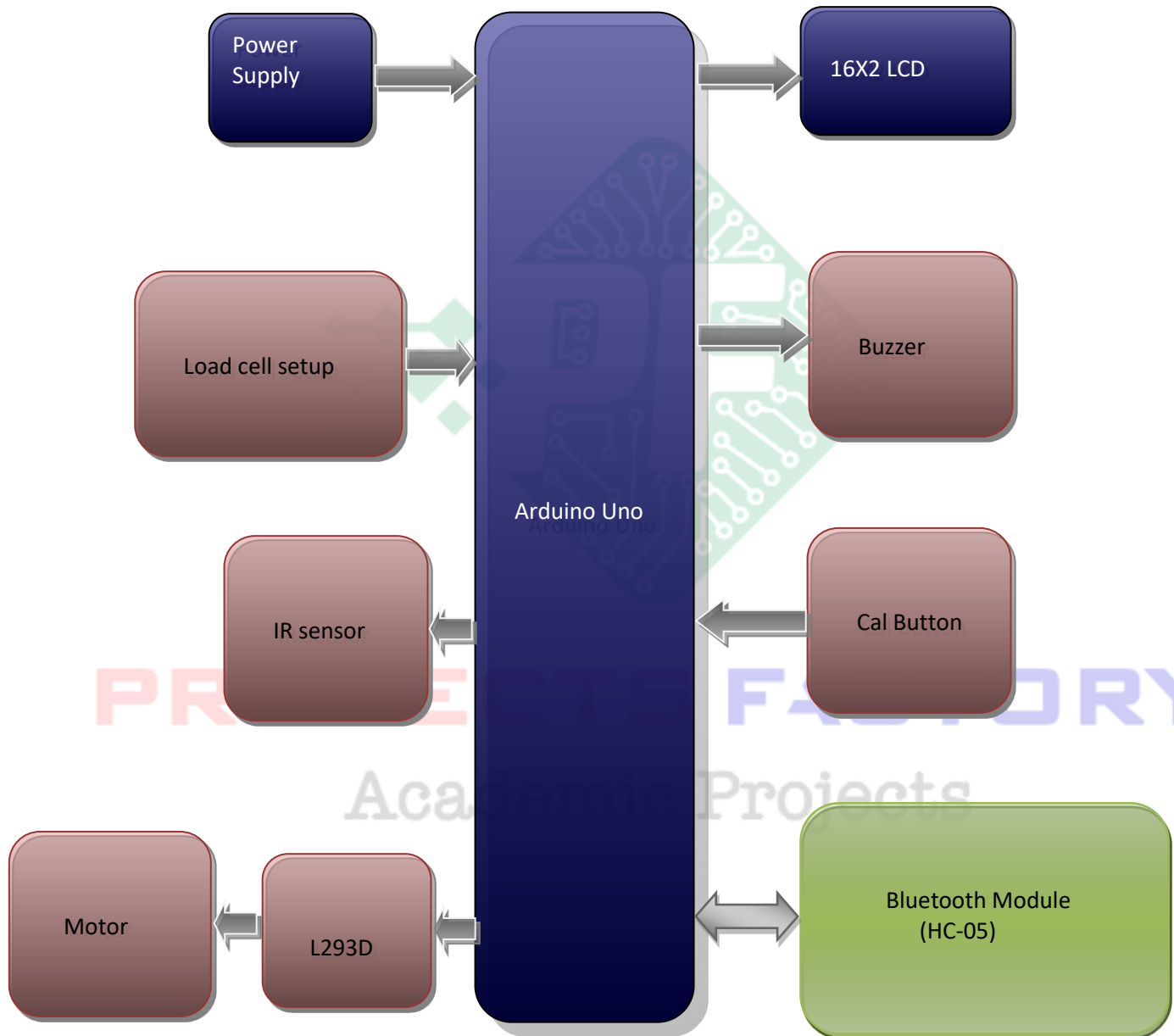
Vehicle Detection sensor   :   IR sensor
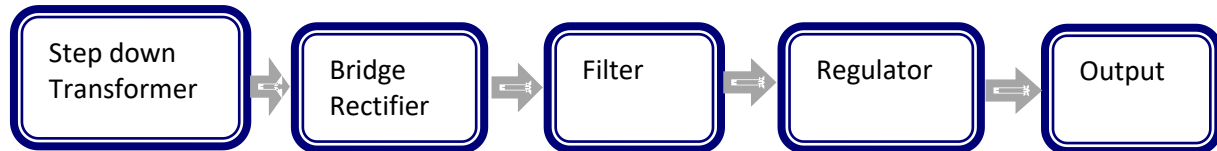
SOFTWARE:

Arduino IDE

Proteus based circuit diagram

APPLICATIONS:

- ➢ Weigh Bridge Application
- ➢ Bridge Protection system
- ➢ Vehicle safety system with weight measuring
- ➢ Road safety system with vehicle weight measuring

BLOCK DIAGRAM:

```
Power          ──────▶  ┌──────────┐  ──────▶  16X2 LCD
Supply                  │          │
                        │          │
Load cell setup ─────▶  │          │  ──────▶  Buzzer
                        │          │
                        │ Arduino  │
IR sensor  ◀──────────  │   Uno    │  ◀──────  Cal Button
                        │          │
Motor ◀── L293D ◀─────  │          │  ◀─────▶  Bluetooth Module
                        └──────────┘           (HC-05)
```

POWER SUPPLY BLOCKDIAGRAM:

```
Step down        Bridge         Filter        Regulator       Output
Transformer  →   Rectifier  →              →              →
```

INTERFACES COVERD:

- We have covered Bluetooth module (HC-05) Interfacing
- IR sensor, H-Bridge (L293d) and Dc gear motor Interface