AUTOMATIC STOP GATE AT BRIDGES FOR OVERFLOW

AIM:

Design and Development of Automatic Stop gate at bridges for overflow.

PURPOSE:

As we know flood is major natural disaster and creates lot of economical and human loss. Sudden water level raise in rivers and canals at bridges is an obstruction for vehicles passage from one end to other end. In recent days we have seen in many areas that some vehicles cross bridges even in overflow of water over the bridge. There is no obstruction system to stop vehicles to enter over the bridge. With advanced technology we can implement automatic stop gate at bridges for overflow. It will detect water overflow at two gates will be closed at each side. Also it has additional feature that will detect vehicles crossed bridge even after gates gets closes and it will send photo to mail.

DESCRIPTION:

Here we used Arduino as main controller and ESP32 cam works on SMTP protocol to send mail. Two servo motors connected to Arduino pwm pins. We used soil moisture sensor to detect water over flow and it will be connected to Arduino digital pins. Two leds red and green interfaced with Arduino digital pins.

WORKING:

Water detecting sensor placed under the bridge. When water reaches beyond normal range, it will detect and send signal to Arduino. Then Arduino sends PWM pulses to servo motors to close gates. Red led will be ON to indicate stop vehicles and also buzzer will be ON. Two IR sensors placed at side of bridge to detect vehicle or human passage over the bridge. If any IR gets activated then ESP32cam take photo and send to mail. This will helps to identify which vehicles or humans cross bridge at the time of overflow.

TECHNICAL SPECIFICATIONS:

HARDWARE:

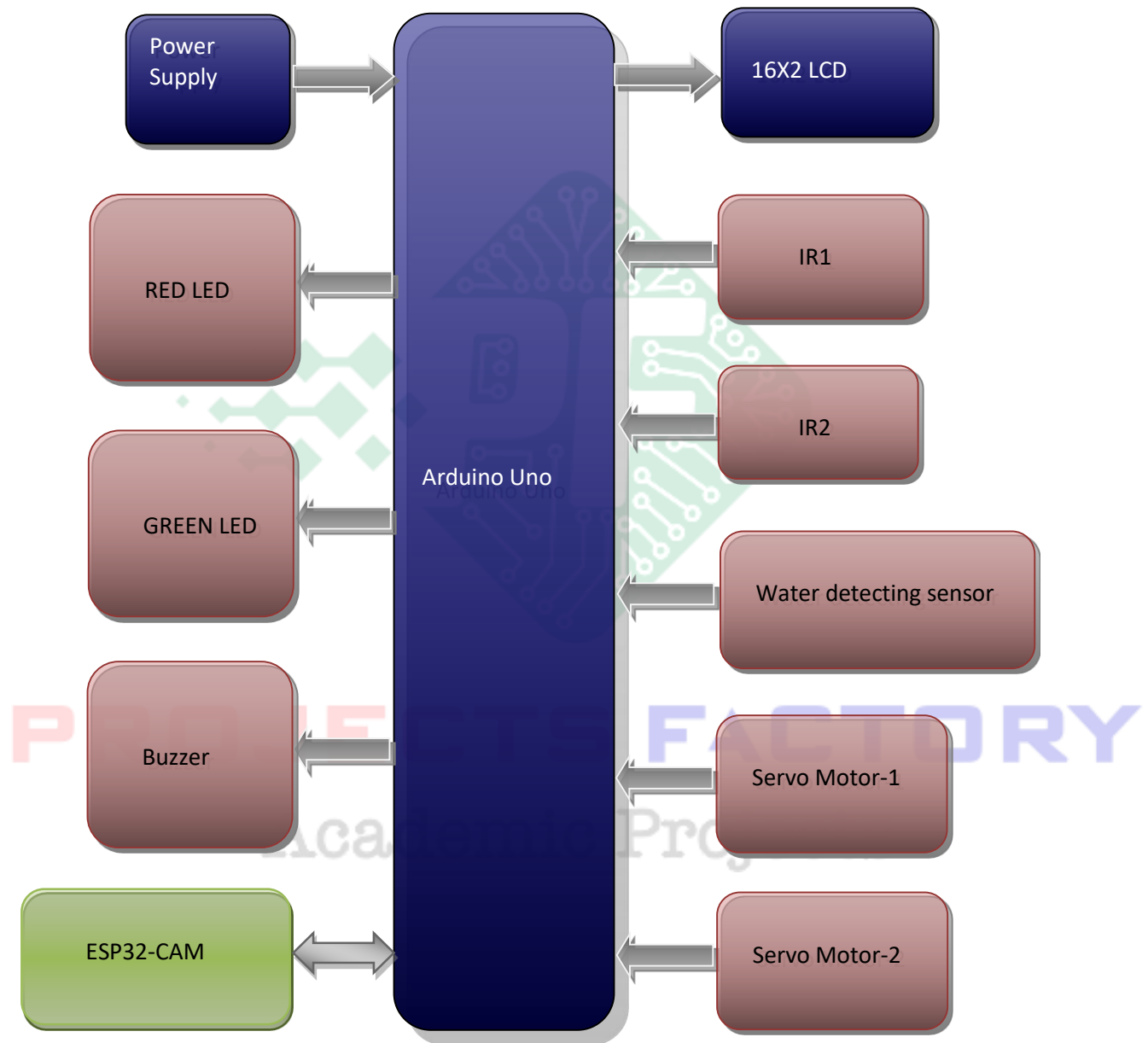|		
Microcontroller	:	Arduino Uno
Crystal	:	16 MHz
LCD	:	16X2 LCD
Camera	:	ESP32-CAM
Servo Motor	:	MG90S
Water Detecting Sensor:		Conductive type
LEDs	:	Red, Green 5mm
Buzzer	:	DC 5V
Power Source	:	12v 2 amp Adaptor

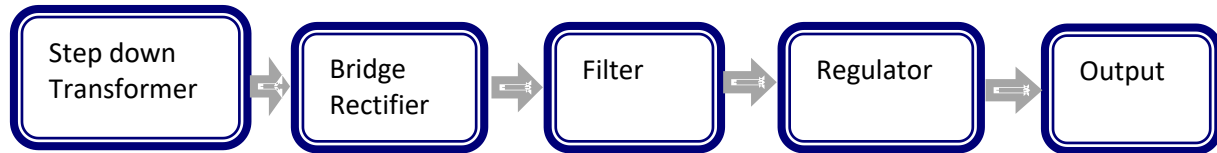### SOFTWARE:

Arduino IDE

Proteus based circuit diagram

APPLICATIONS:

- ➢ Smart bridge applications
- ➢ Floods management
- ➢ Excess water Hazardous applications

BLOCK DIAGRAM:

Power Supply	→		→	16X2 LCD

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Power                                          16X2 LCD
Supply  →

RED LED  ←→    Arduino Uno    ←  IR1

GREEN LED ←→                  ←  IR2

Buzzer   ←→                   ←  Water detecting sensor

ESP32-CAM ←→                 ←  Servo Motor-1

                              ←  Servo Motor-2
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POWER SUPPLY BLOCKDIAGRAM:

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Step down        Bridge          Filter          Regulator        Output
Transformer  →   Rectifier   →               →                →
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INTERFACES COVERD:

- We have covered Arduino and ESP32-CAM interfacing
- Servo motors and Soil moisture sensors interface