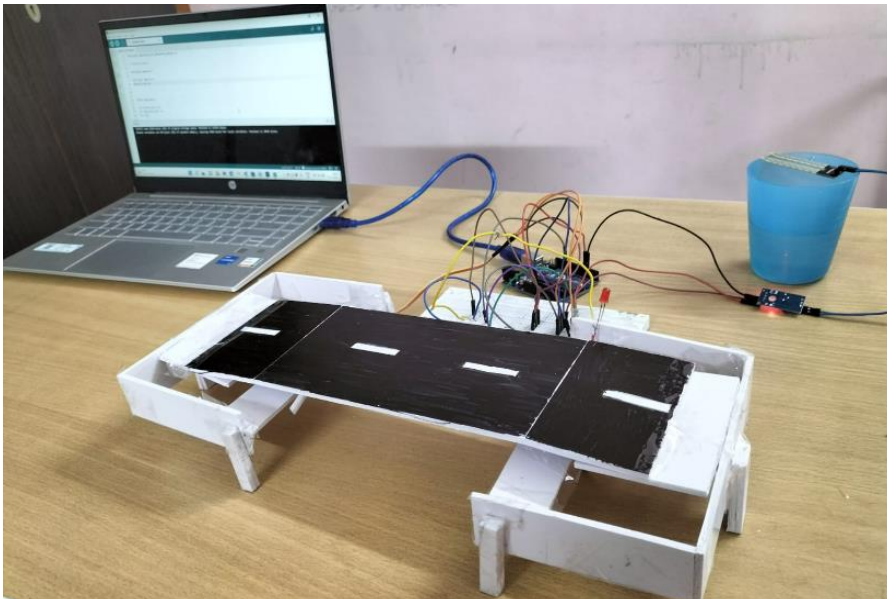
CS227:DIGITAL SYSTEMS

FLOOD MANAGEMENT SYSTEM



Submitted By: Team 19

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FLOOD MANAGEMENT SYSTEM

Team members:

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Requirements:

i. Arduino UNO
ii. Servo Motors
iii. Soil Moisture Sensor
iv. Breadboard
v. Jumper Wires
vi. Sunboard sheet

Overview:

Owing to the increase in extreme climate events, flooding has become a major issue. It severely impacts the lives of not only human beings but also animals, birds and other living organisms. It leads to loss of lives and property, loss of livelihood, decreased purchasing and production power, mass migration, and psychological instability. It also hinders the economic growth and development of a state/nation. Floods can cause widespread devastation, resulting 1 in loss of life and damages to personal property and critical public health infrastructure.

According to WHO reports, Between 1998-2017, floods affected more than 2 billion people worldwide. People who live in floodplains or non-resistant buildings or lack warning systems and awareness of flooding hazards are most vulnerable to floods. To get rid of all these problems, we need a solution. Moving forward in this direction, we have proposed a model which looks at how the flood can be managed and loss of lives and property can be prevented.

Smart Bridge Model:

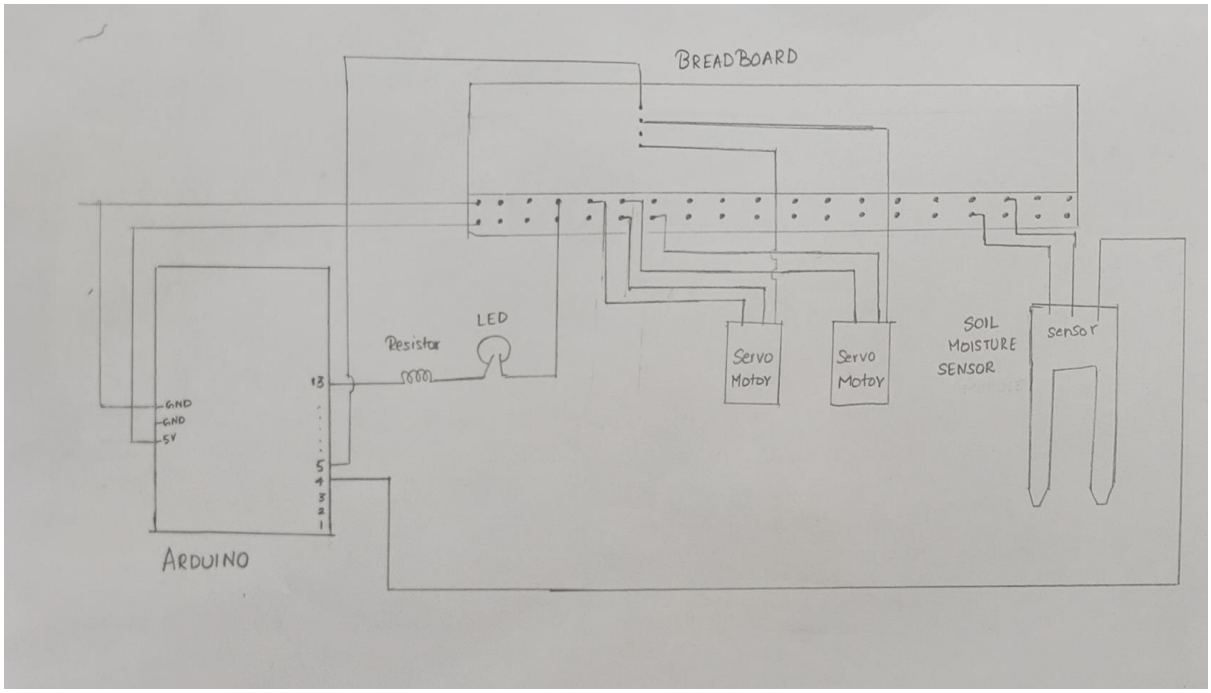
We have proposed a model of a smart bridge which has the ability to sustain itself in the adverse condition of flood. This lift will automatically lift to a height when the water level

reaches a particular threshold height. Before lifting, it will give out a warning by glowing warning LED so that people and vehicles can be moved out of the bridge to prevent any misshapen.

Working Principle and Construction:

The smart bridge will have a soil moisture sensor installed at its pillar at a threshold height, which will be considered a safe height for the water level. When the water level reaches beyond that height, then it will sense the water level and will send the signal, which will lead the LED bulb to glow as a warning sign, which will alert the people and vehicles to move out of the bridge. After some time of the warning signal, the bridge will start lifting up to a newer height, thus preventing the bridge from getting flooded.

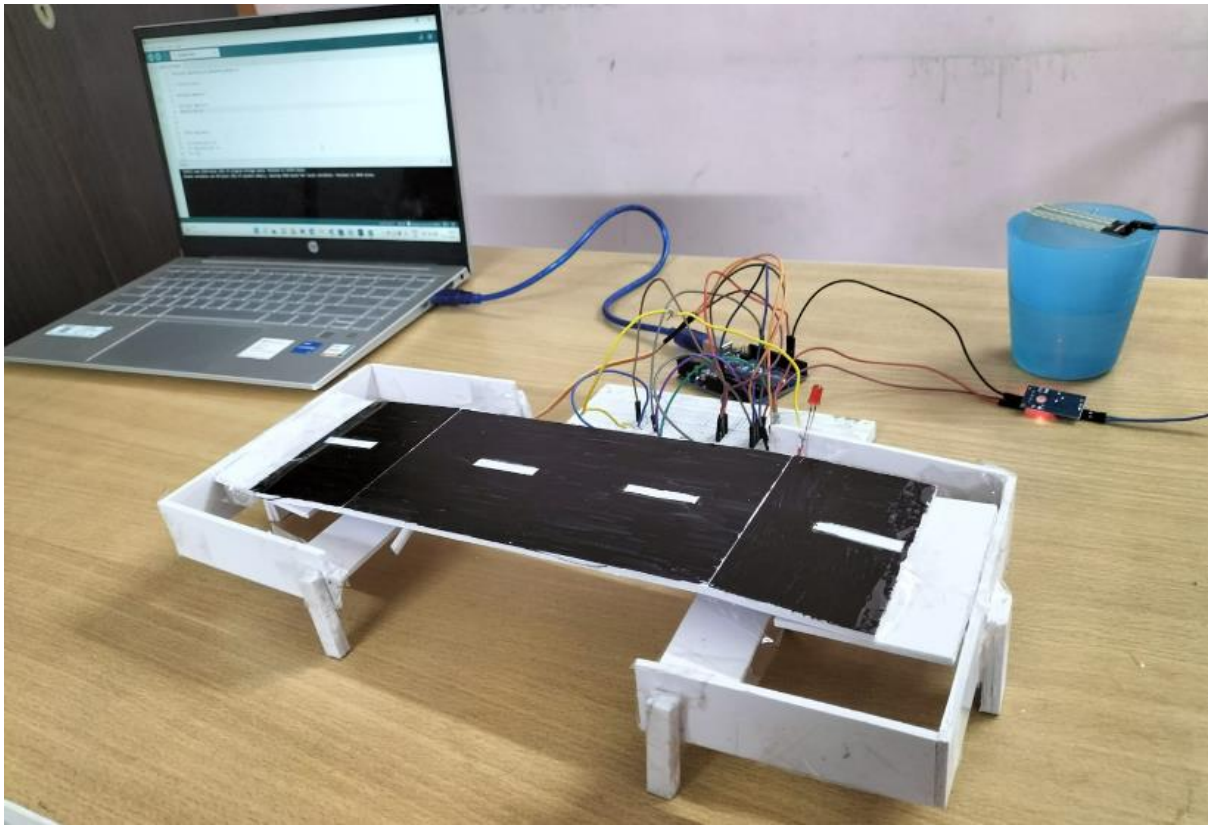
Circuit Diagram:

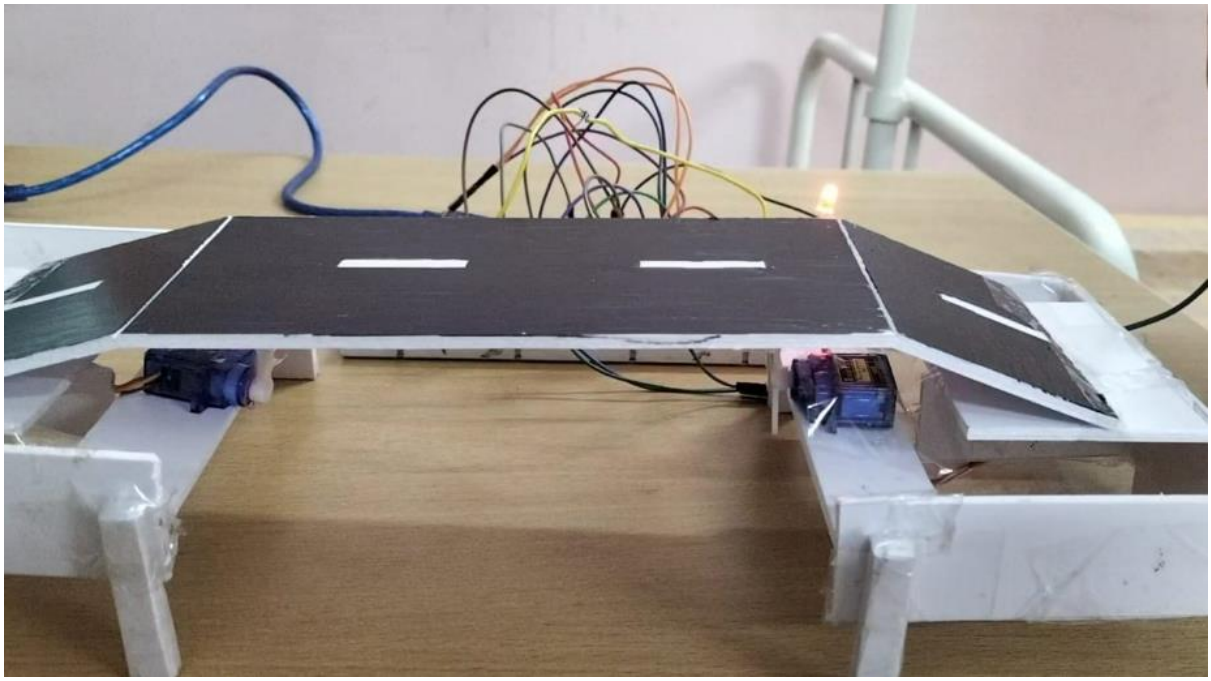


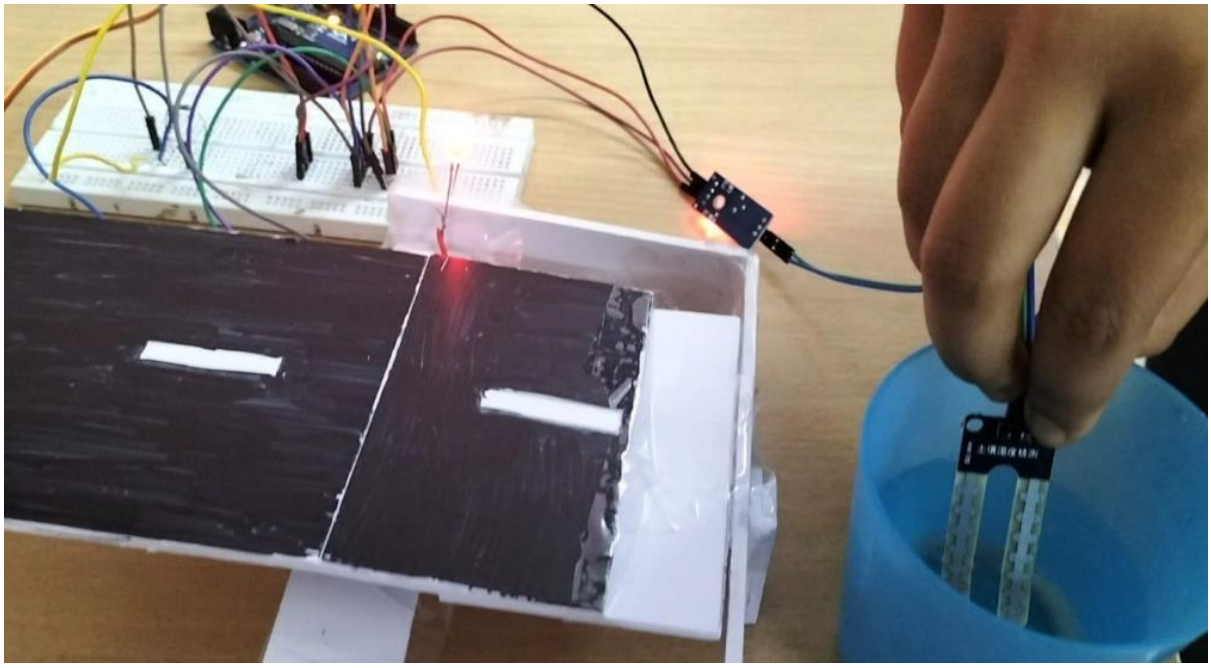
How this project is related to Smart City?

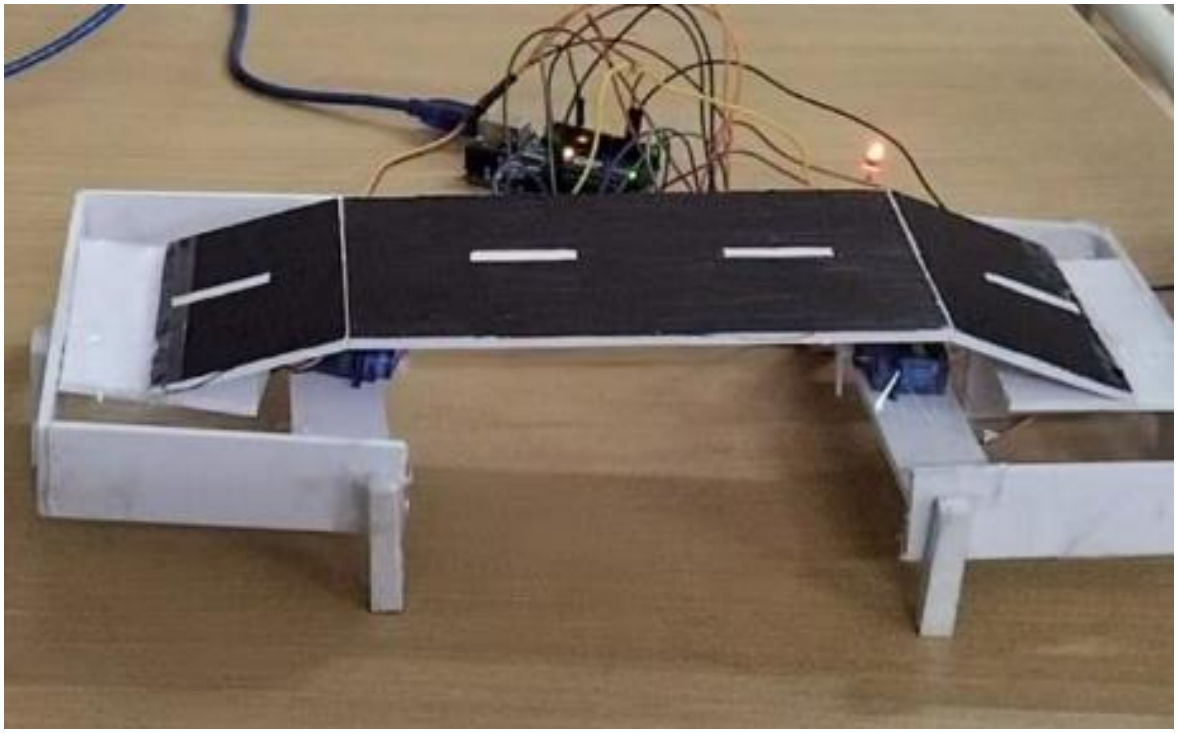
This idea of a Smart bridge enables us to prevent flood situations and enables us to save millions of lives and property. This is a model with advanced features of giving out warning and lifting up the bridge to a new height automatically when the sensor senses the water level. This flood managing system has the ability to contribute greatly to the Smart city idea.

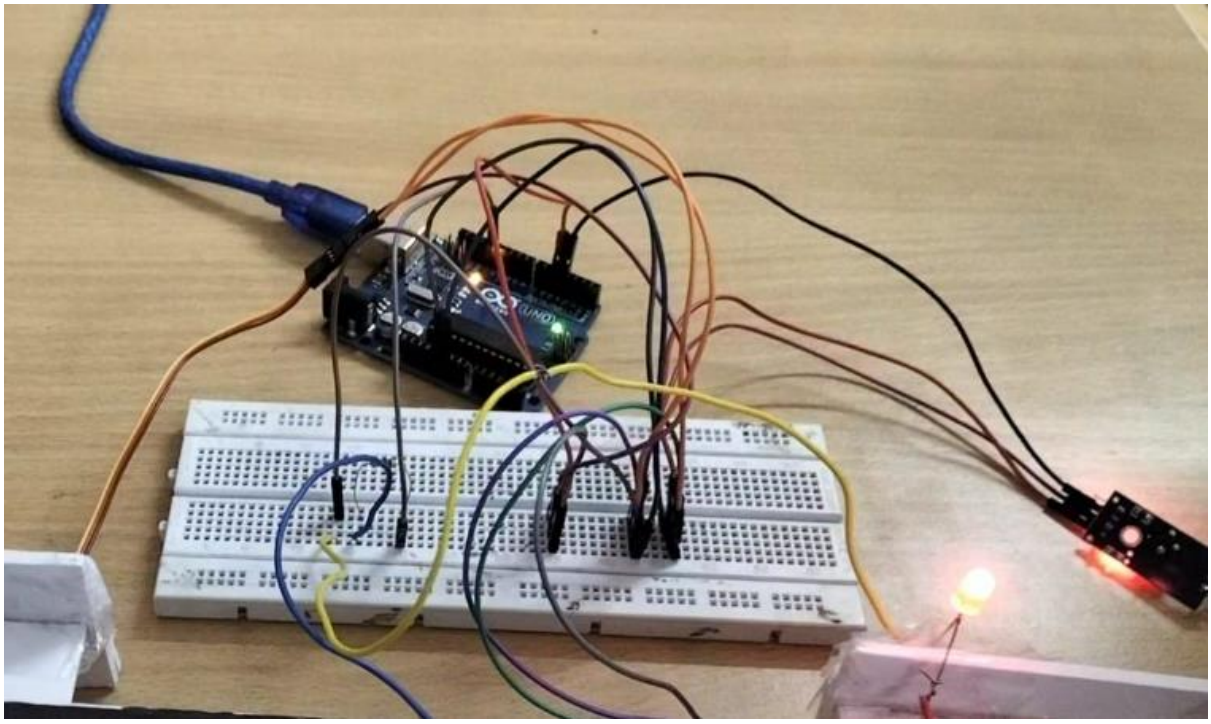
Glimpses of the Smart Bridge Model:











Role of team members:

Khushi Singh (2101CS37):

-Wrote the code for Arduino in the project

-Made the circuit

-Made the report

Kommalapati Lahari (2101CS39):

-Made the circuit

-Video Editing

Baddi Satya Sahithi (2101CS16):

-Project Modelling

-Made the power point presentation

Arduino Code:

```
#include <gravity_soil_moisture_sensor.h>
#include <Servo.h>
#define LED 13
Servo tap_servo;
int sensor_pin = 4, tap_servo_pin =5;
int sensor_signal;
//setup
void setup(){
   pinMode(LED, OUTPUT);
  pinMode(sensor_pin,INPUT);
  tap_servo.attach(tap_servo_pin);
}
//loop
void loop(){
  sensor_signal = digitalRead(sensor_pin);
  if (sensor_signal ==0)
  {  digitalWrite(LED, HIGH);
  delay(1000);
//delay is there so as to give the warning before the bridge lifts up or goes down
    tap_servo.write(0);
  }
//Danger! The water level has exceeded the threshold(safe) height!
  else
  {   digitalWrite(LED, LOW);
  delay(1000);
//delay is there so as to give the warning before the bridge lifts up or goes down
    tap_servo.write(90); }}
```