Security Alarm System for Commutators through Deep Level Bridge

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***Abstract*: Bridge Overflowing is not new to Nagpur and has been experiencing destruction because of this phenomenon. It resulted to great damage to human lives, to their properties and infrastructures. This paper focuses on developing a model of a bridge overflowing detection system called "Security Alarm System for Commutators through Deep Level Bridge (SASB)". The aim of SASB is to monitor and provide warning system to the people passing through the bridge in which it will determine the distance of the water by means of sensor. Sensor will give signal and through the programmed Arduino UNO, it senses the distance of water from the ground, sends alarm if water reaches a certain level that can be detected by the sensor. The proposed water level detector system is discussed in this paper as well as its elaborated testing result. The functioning system of SASB (Security Alarm System for Commutators through Deep Level Bridge) will be discussed in this paper in which it will give warnings and alertness to the people in a potential flood occurrence.**

***Keywords*: Sensor, SASB, Bridge overflow, Alarm, SMS, LED, LCD Display.**

Introduction:

During rainy season water flows over the bridge level in various cities which results in many troubles like traffic jamming problem, delayed work, etc. Construction or reconstruction work is often hazardous and is not at all flexible solution for this. In addition to the lead hazards on bridge renovation and demolition sites, there is a safety and health concern. The following section point out safety hazards that are often present during bridge work. Preventing injuries requires the creation of safety programs, practices, and procedures for identified hazards. These programs, practices, and procedure is communicated, implemented, and enforced by our project to protect the safety and health of workers and travelers.

This water level controller system helps to prevent the overflowing of water from the bridges and helps in maintaining the water level. The water level indicator works on a simple mechanism to detect and indicate the water level at bridges. The sensing is done by using 4 sensors which are placed at different levels on the bridge walls, with sensor 4 to sensor 1 placed in increasing order of height , where sensor 4 indicates the high risk of the water level. When the water overflows or rises above the threshold, the solenoid valve gets on and passes the water from bridge to draining system provided through the pump. The advantages of a water level control systems is to avoiding accidents that are introduced in the network when the water level increases. This automatic water level controller is projected for directing the motor which pull water direct from municipal corporation water supply line. This System is perfect tool for bridge overflow control automation.

Floods have been known to do some significant damage that destroy homes, crops, cars, building and anything in their path. Animals and people get caught in the current of the flowing water and cannot get out before rescue attempts are made. Although flooding was an abnormal phenomena agers ago, but now it is considered a life treating natural disaster for the mankind. Overflowing has always causing massive worries on countries across the continent whereby lost of life's, people displaced, agricultural land submerged in mud's, roads, bridges and houses washed away. As a result of flooding, the damages on assets are clearly visible.

Algorithm for Hardware Development:

Step 1: Start.

Step 2: Water Sensed.

Step 3: Data Encoded.

Step 4: Data Transmitted.

Step 5: End.

Algorithm for Software Development:

Step 1: Start.

Step 2: Data Received.

Step 3: Data Decoded.

Step 4: Data Transmitted to Port C.

Step 5: Exceed Water Level.

If yes Goto Step 6.

If no Goto Step 5.

Step 6: Display Water Level in LCD and LED will glow.

Step 7: Send Text Message.

Step 8: Buzzer On.

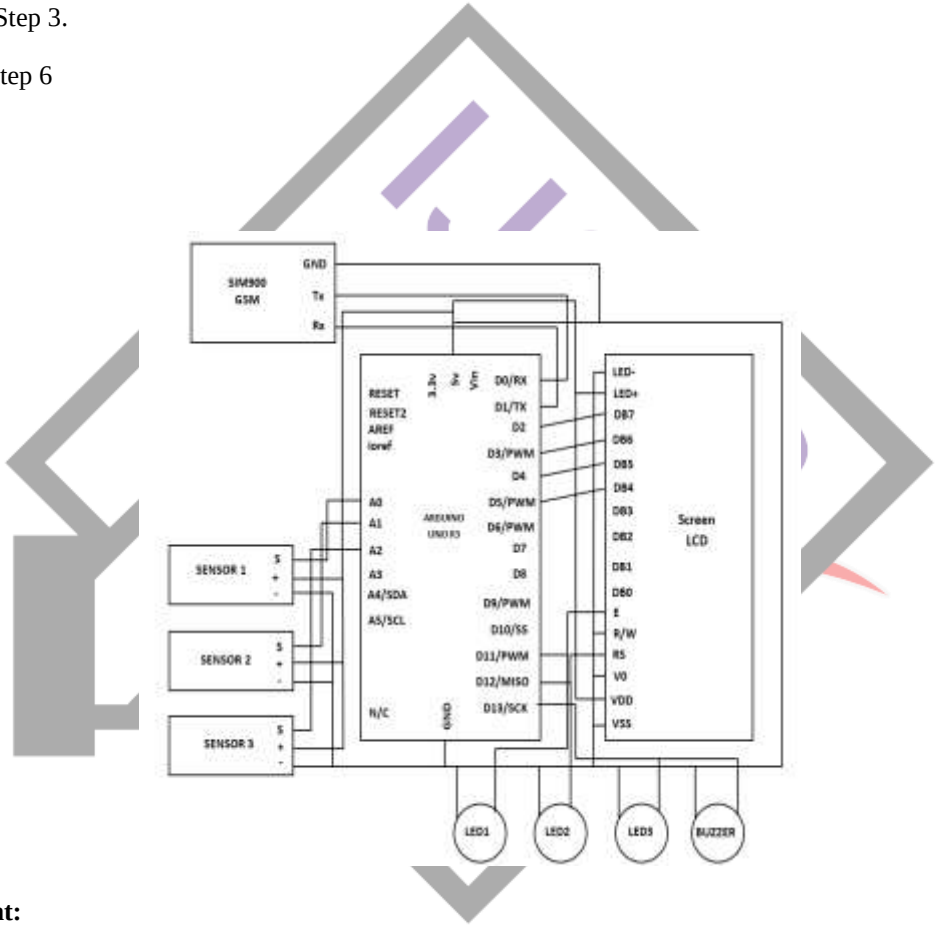
Step 9: New Data Retrived.

If yes Goto Step 3.

If no Goto Step 6

Step 10: End

Circuit Diagram:



Project Development:

As shown in figures below four sensors are used in the circuit, which measures different water level from the walls of the bridge. The distance is measured in feet and that information will be sent to LCD display and the level of water is displayed on LCD on both side of the bridge to make the people aware of risk of water level ahead. As our project is IoT based and will be operated automatically so that no human efforts are required for any task.

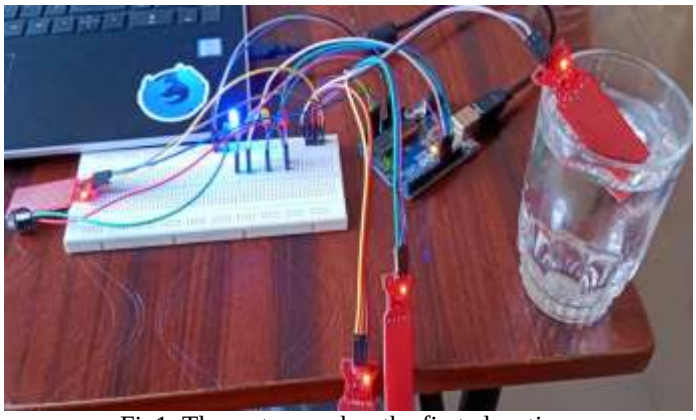


Fig1. The water reaches the first elevation.

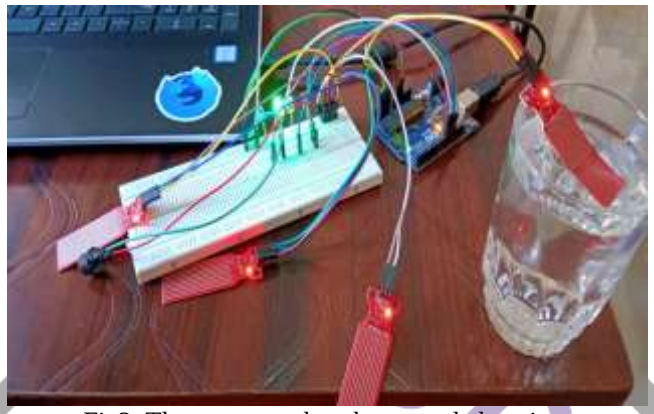


Fig2. The water reaches the second elevation.

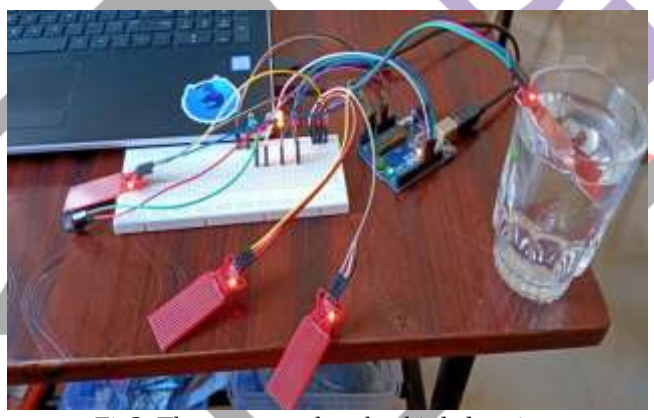


Fig3. The water reaches the third elevation.

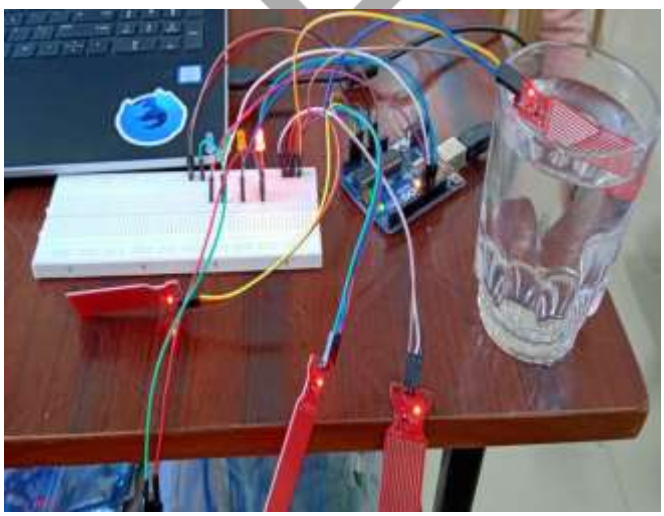
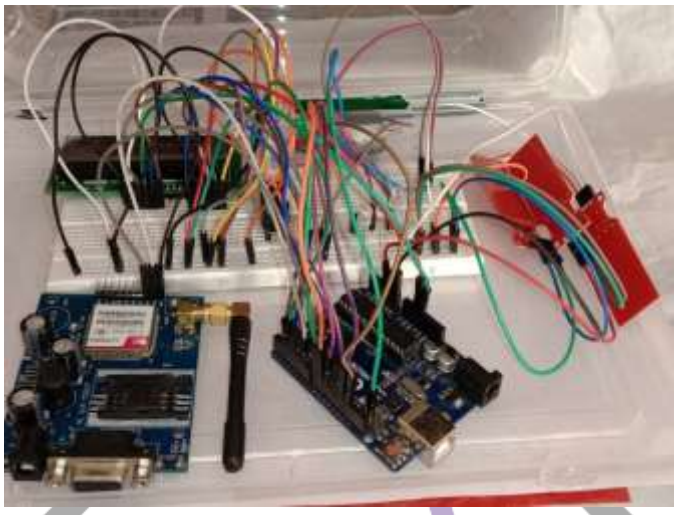


Fig4. The water reaches the highest elevation.

As shown in the above figures four sensors are used at four different levels of the bridge wall. Each sensor will detect different level of water and send to the LCD display. As soon as the water level reaches to the fourth sensor five tasks will be performed, first one it will glow the red light which means danger ahead, second it will ring the alarm to make people aware of risk of the water, third it will display a message on LCD display that "water reached to its highest level so please choose another way or path", four it will activate the motor to throw the water out of the bridge to control the water level, fifth and the last task is that it will automatically send a text message to the respective authorities to take particular actions, for example traffic police will receive a message that water level at particular location reaches at high level so please divert the traffic flow to the other path.

Overall Hardware Setup:



Project Applications:

1. Detection of Water level at Bridge.

2. Making people aware of Water level at Bridge.

3. Is also useful for the detection of Floods and Tsunamis.

Result:

A water level indicator with an alarm that will aware people for the harm of water ahead mainly in rainy season. A Water level detector and controller without microcontroller is a low cost system that is capable of managing water levels at different places like at bridges, near rivers and dams, etc.

Conclusion:

This project was intended to design a simple and low cost water level indicator. This is not only for bridges but also used for dames or for detecting floods or Tsunamis. We tried to design a system in such a way that its components will be able to prevent the risk of water. The whole system operates automatically. So it does not need any professional to operate it. It is not so expensive. This project has much more scope for upcoming research and development. Though it is a project, we hope some modification in this project will lead to a reasonable range of usage.

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