

# Smart and Safe Child Rescue System

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**ABSTRACT** - In India for past few days people are facing a distressed cruel situation like child have fell in the bore well and struck in the hole which is uncovered and getting trapped. Rescue of trapped child from bore well is very risky and difficult process when compared to the other accidents. It takes more than a day to save the child. Here, in this paper the child who is stuck inside the hole is to be saved by the metal plate using servo motor. In this alternative scenario there will not be any requirements of digging hole parallel to the bore well. Hence to improve this project, we are adding IR sensors. These sensors will sense the presence of the child, buzzer will beep and message will be displayed in the LCD display. When the child fell inside the bore well the message will pass to the nearby police station and nearby person. Hence the child can be saved easily and shorter period of time without any difficulties.

**Key Words:** Arduino Uno mega 2560, GSM Module, IR Sensors, Servo Motor, Metal plate, Switch, Buzzer, LCD Display, LED.

## I. INTRODUCTION

Water scarcity is the major problem faced by human society currently. Recently many accidents of children falling in the open bore well have appeared. Very few children have been saved in such accidents. Many were died due to lack of oxygen and lack of time period they had taken to save the child. Even if rescued late, most victims were reported injured. This abandoned bore wells have become death pits and started taking many lives especially small children. The incident of losing lives trapped in bore well was highlighted in 2006 where a 5 year old child named Prince was rescued by Indian Army experts after a tough combat which lasted up to 49hrs. Report says starting from 2009-2020 more than 40 children fell into the bore well consequently. So saving a child from the bore well became a difficulty and a risky process. A small delay in the rescue process can lose his/her life. Even though the necessary oxygen, increasing temperature and humidity in such depth will be another risk for child life. In order to solve this kind of situation the rescue system is designed to save the child

inside the bore well and the design is named as "BORE WELL RESCUE SYSTEM" which is sent inside manually and holds back the trapped child systematically.

## II. LITERATURE SURVEY

### 1 Rescue of the child from bore hole using robot

Saran et al [1], they have mentioned that, nowadays child often falls down in the borehole which is left uncovered and get trapped. It is difficult and also risky to rescue the trapped children to aid in such rescue we proposed a system of designing robots to the rescue of a child in a borehole. The robot structure consists of power supply, switch pad, gear motors, Oxygen concentrator, camera and Microcontroller. The condition of trapped child is captured with CCTV camera and monitored on a TV. A safety balloon is introduced in order to provide extra safety. Once the lifting rod reaches a safe position under the child, an air compressor is operated to pump air to the bladder attached to the end of the lifting rod through an air tube that runs downwards inside the lifting rod. The bladder provides a safe seating to the child. When the child is secure, the lifting rod is contracted to its maximum position. The motor is then reversely operated so as to unclamp the system. Simultaneously, it is lifted out of the well using a chain or rope. The programming language is Embedded C which is executed by MP lab Integrated Development Environment.

### 2 Rescue operation without human intervention using microcontroller

Venmathi et al [2], describes the rescue operations without human intervention. Here the wheeled leg mechanism is design to go inside the pipe and the legs are circumferentially and symmetrically spaced out 1200 apart. The robot can adjust its legs according to the pipeline dimensions. The robot has consisting of power supply, switch pad, and gear motor. The child position is captured from bore well with USB Camera and monitored on PC. The LM33 temperature sensor and 16\*2 LCD are interfaced with PIC 16F877A microcontroller to sense and display on LCD.

### 3 Rescuing the child using high resolution camera

Albert Francis A[3] , describes the first step to visualize the child this is done by lowering the high resolution Camera inside the bore well. With the aid of high resolution camera the location (depth) and position of the child can be determined. It is mechanical based project so this system doesn't have any intelligence and it is non atomized system.

### 4 Child rescue using two micro-robotic structures

N. Bourbakis and I. Papadakis- Ktistakis [4] describe design of two micro-robotic structures in an effort for assisting the detection of human under debris and rescue them. These microstructures will play complementary role to existing large robotic structures, which mainly perform different rescue tasks. Here the micro-robot, called this as, is under development by a research team consisted of researchers from the ATRC-WSU (micro-design, software), the Ohio State University (micro-antennas).

### III. METHODOLOGY

One IR Sensor is placed to indicate the child nearby and second is to indicate that the child has fell down. When the child is very near to bore well, the sensor senses the presence of the child and buzzer beep the very loud sound. LCD will display the message "THE CHILD IS NEAR THE BORE WELL" and if someone sees or hear the beeping sound they will rescue the child. Suppose if nobody is present near the bore well and child fell down in to the bore well. The metal plate connected to Servo motor initially placed below the bore hole. If the sensors senses the child, the plate rotate vertical to horizontal, the child goes in and falls in to the bore well and LCD will displays the message as "THE CHILD HAS FELL DOWN" and simultaneously alert message will be send by Arduino uno to GSM module through Sim 1800L to nearby police station where they will get notification in their mobile phone. When the child fell on the plate, the plates get the child up to the ground level through the help of Servo Motor. By using the switch we can manually fix the plate to its original position.

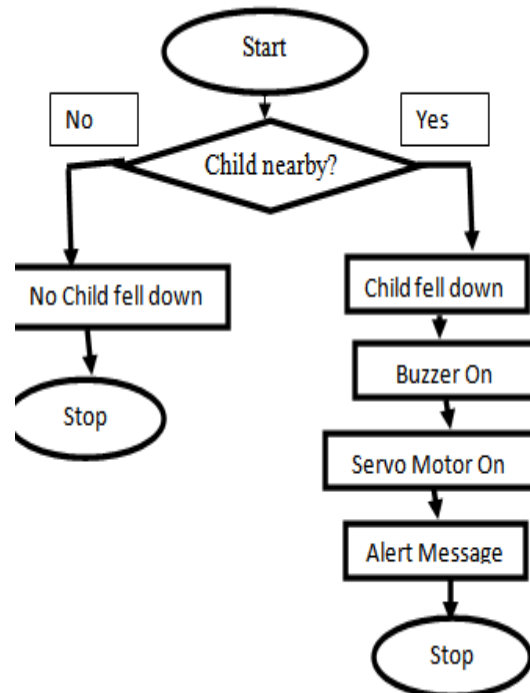


Figure 1. Flow Chart of the System

### IV. SYSTEM DESIGN

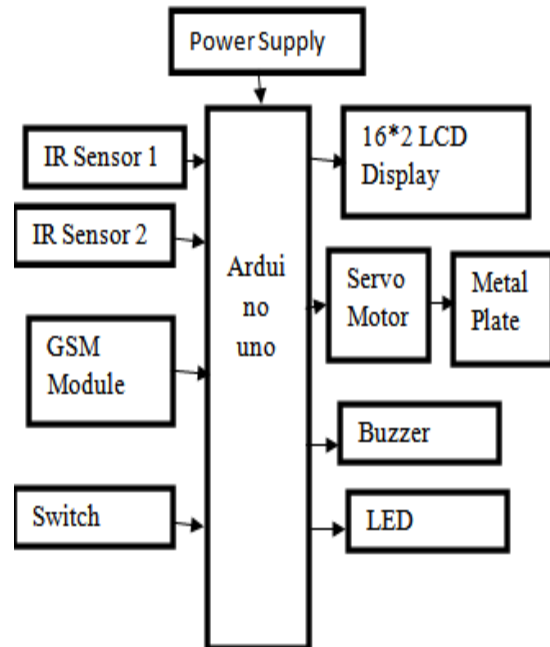


Figure 2. Block Diagram of the System

Initially the status of the sensors is checked. If the status is found to be 0 / NO that is no one is identified in the bore well. If the sensors is found to be 1/YES then it is identified as a person or any object fallen into the bore well. Immediately the buzzer mounted outside the system will get activated and

starts ringing. Servo motor gets initiated automatically and starts pulling the person or object up. Simultaneously sms alerts will be sent to nearby police station, and concern authorities to take rescue operation. Until someone comes and help buzzer keeps ringing. Once the buzzer is off again the system is set to normal state.

## V. RESULTS



## VI. CONCLUSIONS

“Smart and Safe child rescue system” is mainly designed to save many lives of children who fall inside the bore well. In the past 10 years, lots of lives had been lost by falling in to the bore well because digging a pit beside the bore well is very tedious and timeconsuming process. By using bigger motors, arms and advanced technology this project can be implemented successfully. This can be concluded

that the proposed system can retain the lives of many children who fall into the bore well in future.

## REFERENCES

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