Borewell Rescue System

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ABSTRACT: Bore well accidents are common due to uncovered openings of bore well. It is very difficult and risky to rescue the trapped children. A small delay in the rescue can cost the child his or her life. Lifting the child out of the narrow hole of the bore well is not easy. The child who has suffered the trauma of the fall is confined to a small area where with the passage of time, the supply of oxygen reduces. The main objective of this project is to design and construct a portable robot which is cost effective, quick in action and accurate. This robot is also capable of performing life saving action like supplying oxygen. The Bore well Rescue Robot is capable of moving inside the well and performs operations according to the user commands. The proposed model is designed to provide the child with two level of safety achieved by using robotic arms at the top and safety airbag at the bottom. This arrangement ensures that the child does not slip further deep during the rescue operation. The robot is operated through personal computer according to the observations made continuously using CCTV camera. MATLAB tool is used for programming the controller.

Keywords: camera vision; MATLAB and Android application; supply of basic requirement; safe lifting process.

1. INTRODUCTION

The bore well rescue system aids to recover children from the bore well without any danger of the victim. It's a robot mainly focused to work underground and other such remote areas. This robot is preferably used for rescue operations. The basic idea is to get into the depth of the bore well hole and get the trapped child out safely and as early as possible. It compensates for the manual work which includes human effort and also requires large amount of time for the operation. Hence, this robot acts as a replacement for military force by being the alternative solution and also avoids unnecessary risking the life of a soldier.

2. DESIGN AND IMPLEMENTATION

A. BLOCK DIAGRAM
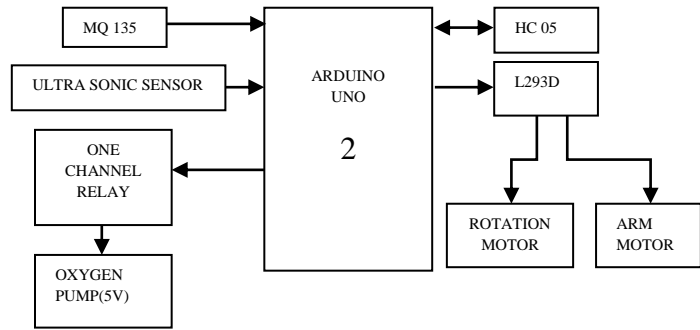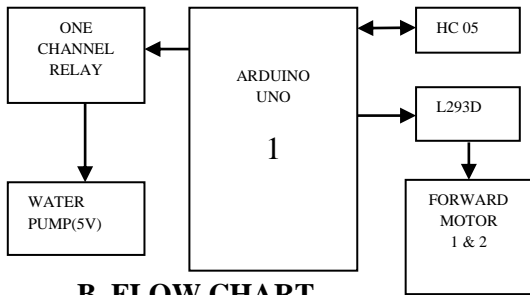
B. FLOW CHART
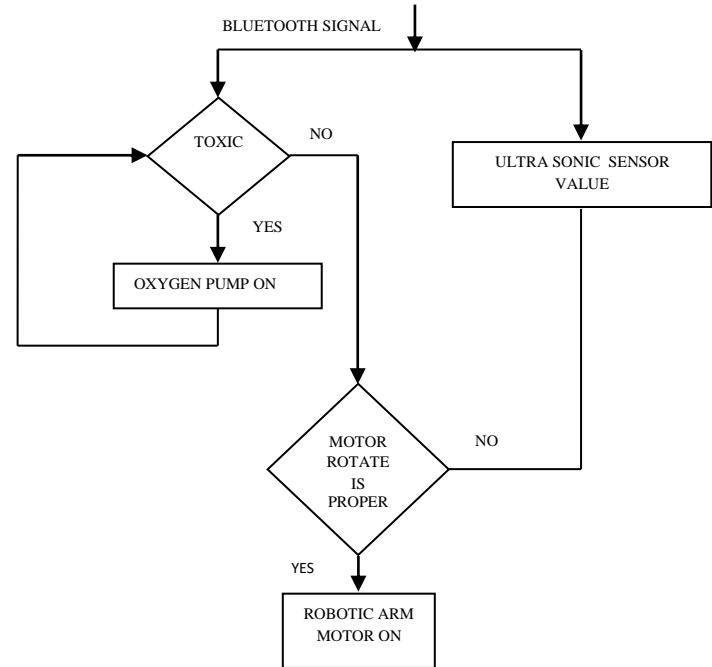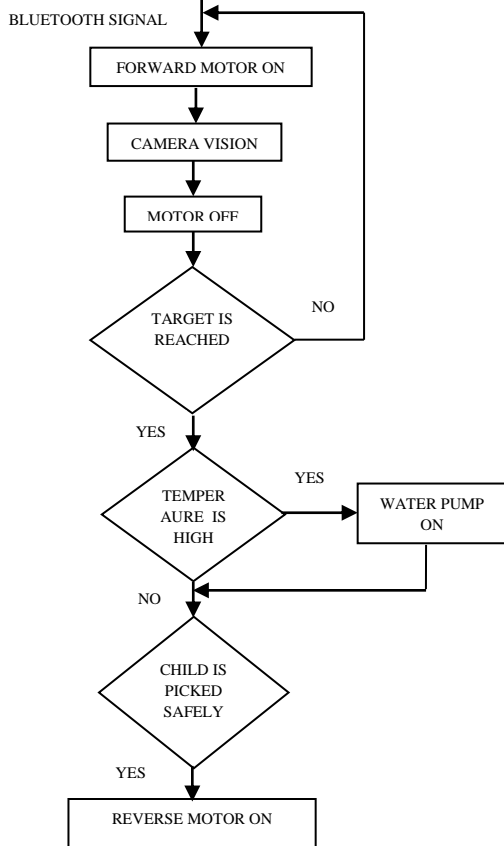
The full hardware system can be illustrated as a mechanical system will attached to a higher plate and it is released using chain mechanism. The ultrasonic sensor is connected to the lower plate and the distance from the top of the bore well to the victim is measured and this distance will be displayed in the android app.

Before performing the pickup operation it is important to analyze the internal condition of the bore well where the victim is held helpless. If the victim is in panic mode due to lack of oxygen or due to presence of any toxic gas then oxygen is supplied. If the toxic level displayed is high, the water supply is also provided using the manual switching. This system reduces the complexity of the task and helps in lifting the victim safely.

The whole scenario will be fed live through the camera to the laptop. The MATLAB is used to observe the motion or the movements of the victim inside the bore well which will provide the exact area of the motion of the victim. The whole view of bore well is obtained using the high resolution camera. The whole situation is controlled by two arms of robot. The gripper then grabs the victim body by expanding or contracting the arm according to the requirements. The gripper then holds the target tightly to bring it out of the bore well.

3. REQUIREMENTS FOR THE PROJECT

The system hardware requirements are as follows:
- DC Motors(10 rpm)
- Motor Drivers(L293D IC)
- Arduino Uno
- Bluetooth Module(HC-05)
- One Channel Relay
- Gas Sensor
- Arm Gripper

Software Requirement
- MATLAB
- Android

4. RESULT AND ANALYSIS

The code was tested and verified using arduino software. The program was successfully uploaded in arduino and input output conditions are verified. The camera module was used and image processing is done using MATLAB. Two 10rpm motors are used for the movement of the robot successfully.

5. CONCLUSION

Human life is precious. Our bore well child recue system is a significant attempt to save the life of the victim of bore well accidents. Besides this, the unique capability of climbing through vertical and inclined pipes makes wide scope of application for this machine in manufacturing industries and other relevant fields. In the current design of bore well child saver machine has been made to suit every possible situation may occur in rescuing operation. We like to conclude with the help our project, we able to rescue without any damage.

6. REFERENCES

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