IOT Based Borewell Rescue Robot

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**Abstract**: This robot is used to rescue the stuck child from borewell. It is fast, economical and safe. It has facility to monitor the trapped child through latched sensors and camera, detect the presence and provide a supporting platform to lift up the stuck one. This system will attach a harness to child using robotic arms to pick up. The robotic arm having a motor attached to it will be used for picking and grabbing. This proposed system will easily rescue the child within no time without major injuries. Visualization of the child is made possible with the infrared camera and a monitor. This is a light weight machine that will go into the bore well pipe and save the child's life by performing the required action systematically

**Key Terms – Automated, Robotic arms, Arm manipulation**

I. INTRODUCTION

In order to meet the increasing demand for water, bore wells are dug. But these are usually left uncovered and abandoned due to which children often fall into it. Normal rescue operation strategy involves digging a parallel pit to achieve the child's position and adjacent holes are made into walls of the bore well. But it is a time-consuming process and may cost life. A multifunctional, reprogrammable and intelligent manipulator designed to perform a task is a 'robot' hence, using a robotic structure, it is possible to rescue the child within short time.

II. RESEARCH METHODOLOGY

The term methodology refers to a systematic way of carrying out of all the activities, by providing a framework of development. It covers the small prints of the different methodologies which can be used for the project and selects the most suitable technique for the development of the system.

The features of this system are as follows:

- The operational framework involves continuous monitoring and control by an operator who responds to challenging scenarios and obstacles. A specialized mechanism employs a circular plate housing a fiber cable, which is maneuvered using pulleys and chains. Utilizing an infrared (IR) device, the system detects the presence of a child, prompting immediate action. Actuators are engaged to stabilize the circular disk upon detection of the child, ensuring its fixed position. Subsequently, the disk is rotated to identify any gaps between the child and potential obstructions. Upon locating the gap through camera surveillance, an arm equipped with a gripper is precisely maneuvered to extract the child from the confined space.

- Now, since the child is assured by not sliding further in to the well, the entire system unit is then carefully lifted up and the child is rescued safely.
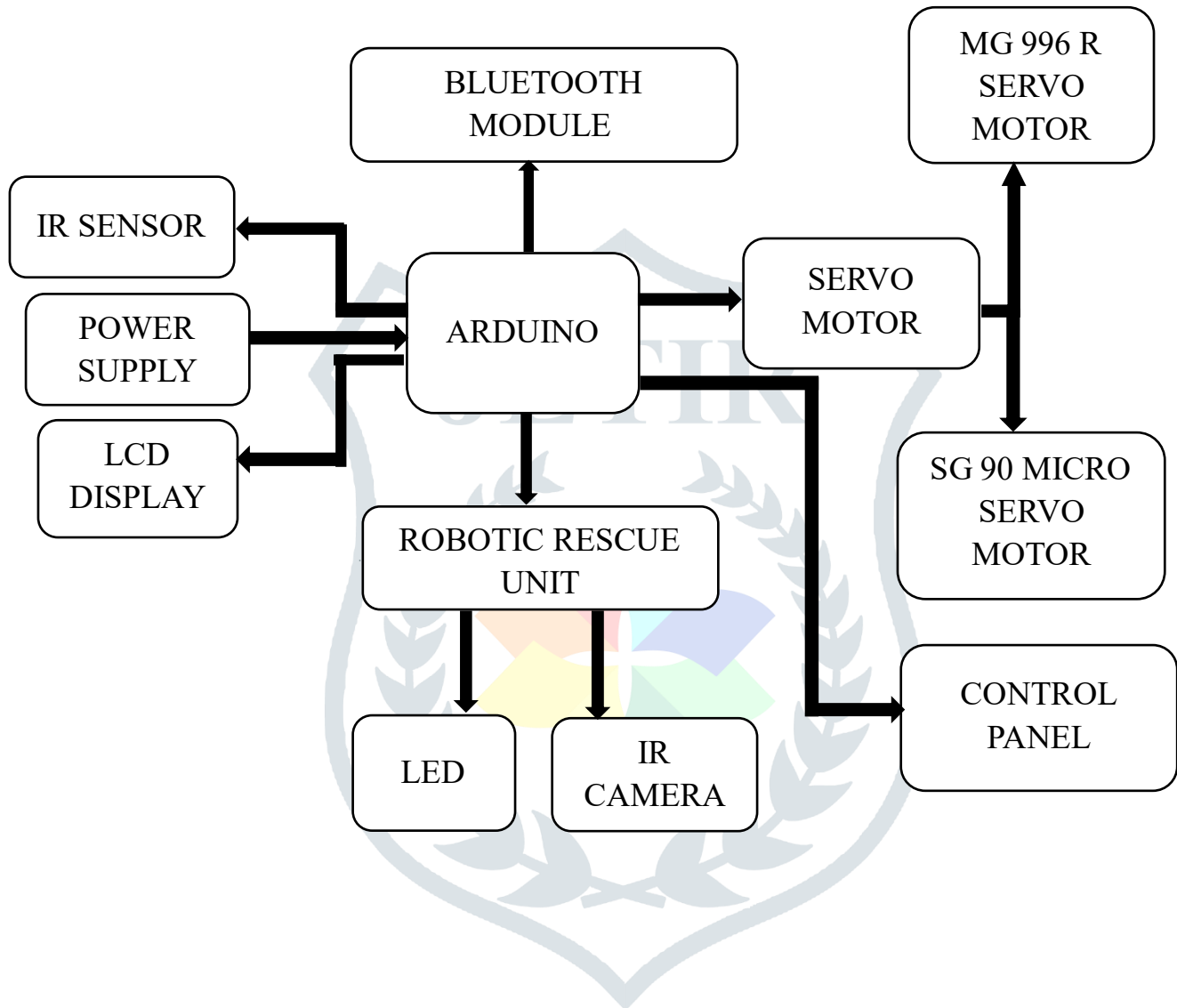
III. FINAL IMAGE OF PROJECT

IV. CONCLUSION:

At present, instruments or devices to rescue the child who is stuck in the bore well is not moreover available because of lack of efficiency and possibility of failures in existing instruments. So, we designed a robot of high efficiency to rescue the robot with no or minimum possibility of failures while rescuing. Also, it is cost efficient so that the needed person could afford it easily. The controlling is very easy and done by operating by live monitoring through the camera. Through this we can rescue the child with lesser probability of failure and injuries.

V. FUTURE SCOPE

In future, we could use this project in various other applications by adding additional components to it. The structure is made strong enough to sustain all possible loads, though it can be flexible at the same time to adjust wider range of borewell diameter and any change in the diameter of borewell. We can send these robots to dangerous zones by connecting smoke sensor to the robot and can get the information related concentration of smoke or gases in respective fields and sensor will detect the poisonous gas and will give information to the microcontroller. The microcontroller gives the information to the transceiver from where we can get the data on the PC.

VI. Mobile Application

As bore-well rescuer: - The main application of this project is in the rescue operation of the stuck child from the bore well.

Miscellaneous Application: This robot is capable of climbing vertical pipes or drive through horizontal or inclined pipes and may be used in the following areas:

- In manufacturing industries.
- In space programs.
- In radio active sites or highly hazardous regions.
- In under water operation.

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