Rescue From Bore Well Using Robotic System: A Review

Dr. Neeta A. Doshi[1], Swaranjali V. Kokare[2], Rutuja S. Kumbhar[3], Rutuja B. More[4]

[1, 2, 3, 4] SVPM COE Malegaon (BK), Baramati

Abstract- *In India for past few days, there have been several accidents of people falling into abandoned bore wells which is left opened and get trapped. Abandoned bore wells seems to be death pits for people. These bore wells in turn have started to take many innocent lives. In these cases normal operation of human rescue is done by using big machines with large manpower involvement. The rescue process to save the human from bore well is a very long and complicated process. It is time taking process and also risky in various ways. So the aim is to prevent the people from falling in ton the bore well. Our Paper reviews and suggests a new design which has a sensor kept at top of bore well hole. Ithelps to sense the people if they fell inside. If the system senses the people the automatic horizontal closure kept at around five feet depth closes and prevents the people from falling beneath it.*

Keywords- (Rescue Robot,Bore well accidents,Artificial arm, Safety to people)

I. INTRODUCTION

Water scarcity is the major problem faced by the human society. Due to drought and depletion of underground water more bore wells are drilled on the surface of the earth. Due to water scarcity more bore wells are being sunk. In many areas the bore wells are drilled and leaved as it as open without proper covering. This abandoned bore wells have become death pits and started taking many innocent lives especially small children. Now a days falling of peoples in bore wells are increasing due to the carelessness of human beings. The holes duged for the bore wells are deep around 700 feet. In these cases the rescue of peoples from such deepest bore wells is quite challenging. Many times the rescue system for peoples from bore wells may risk the life.The existing system for rescuing the people from bore wells is not only difficult and also very risky to save the trapped human life. A small delay in rescue operation can even cost human life. Even though the necessary rescue operation is taken, many factors such as lack of oxygen, increasing temperature and humidity in such depth will be another risk for human life. So far there are many solution   but with limitations available for giving relief to such accidents

II. LITERATURE SURVEY

Kavianand .G [1] describes the designing a robot for rescue a child from inside bore well. This robot is capable of moving inside the bore well. This Smart Child Rescue System consists of PIR sensors which help to sense only humans irrespective of the external conditions. In this system Raspberry pi is used which is costly than Arm microcontroller. It requires more peripherals.

Nish Mohith Kurukuti [2] describes the rescue operations without human intervention. The robot can adjust its legs according to the pipeline dimensions. The robot consists of power supply, actuators, and dc motor, servo motor. The child position is captured from bore well with Camera module and monitored on PC. The ultrasonic sensor interfaced with ARDUINOUNO.

The arduino uses   a microcontroller not an application processor, so can not run any operating system on it. You can not get a video output or Ethernet port on arduino.

Manish Raj [3] describes the diameter of the narrow borewell for any adult person because light goes dark inside it, the rescue task is challenging. The robotic system attaches a harness to the child using pneumatic arms for picking up. A teleconferencing system is also attached to the robot for communicating with the child.

Albert Francis A [4] 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 automized system.

N. Bourbakis and I. Papadakis-Ktistakis [5]describes 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 larger 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).

K. P. Sridhar C. R. Hema S. Deepa[6]described a wireless sensor fusion system in the mechanical gripper robotic arm to assist the rescue operation and paramedical team effectively. Multiple sensors are interfaced to the wireless sensor fusion system to acquire the important parameters such as humidity, temperature, CO, and other gaseous levels from the bore well to monitor the condition of the child inside the bore well. In this system pic microcontroller is used which has low speed operation than Arm.

Navya Amin Singh and Markus Borschbach[7] described the factors influencing the accuracy of detection of obstacles using Ultrasonic Sensors in our local navigation system for the visually impaired. The findings of this paper serve as the basis for design and technical set up of the obstacle detection system. The distance between the object and the sensor, movement of the object or the sensor, change in temperature or pressure have an influence on the accuracy of the detection of obstacles as well as the estimation of distance between the obstacle and the user. Thus, placing and detecting the obstacles at an optimized distance becomes crucial to ensure safety of the visually impaired user. The results show that inaccuracy in distance estimation between user and the obstacles is considerably low thus indicating US as an optimum choice for detecting obstacles in the local navigation system. However, further improvement in the distance estimation and obstacle detection can be achieved by using a combination of other sensors along with the US sensors.

Preedipat Sattayasoonthorn and Jackrit Suthakorn[7] described a battery management for rescue robot battery management for rescue robots is summarized in this paper as a guideline for new developers. This paper covers the topics of power consumption, battery selection, battery charging/ discharging and battery maintenance. But this system requires more hardware and also its design is complicated so this system is costly.

Shuhai Wang[8]Designed a system Ultrasonic sensor is a component of detecting the distance.

STC89C52 SCM (single chip machine) is a control component.

According to the design requirements and tasks, the choice in the program must be paidattention to the operation

and price. There are many tools and methods in measuring distance in present, such as laser ranging, infrared ranging, ultrasonic ranging and more advanced satellite ranging, and so on. The advantage of laser ranging is the good color, strong direction, very long distances measurement. Its disadvantage is the blind spot in 15 meters. The advantage of infrared ranging is long distance measurement.

Measurement distance can reach to 1-5 kilometers. Its disadvantage is higher price than ultrasonic ranging.

Wang Chuanjiang[9] Described The framework of rescue robot is just, it is composed of rescue mechanism, anchorage set, hoist set, manipulator, frame work, control and communication system. The robot system can undertake the rescue tasks for small caliber wells, whose diameters can change from _1mto _0.3m by replacing some mechanisms. This system can be used for small caliber well rescue system. It requires more hardware.

III. CONCLUSION

Rescue from bore well using robotic system will be designed especially to save the human from bore well at short period of time. This system is designed in order to overcome the drawbacks faced by existing conventional system for rescuing the human from the bore well.

This system prevent the people before they fall deep into the bore well. All the units are powered by Raspberry pi Controller is low cost, low power and superior performer. Thus by this Rescue System, many humans can be saved.

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