

Implementation of Automated Robot to Rescue the Child from Bore Well Using Raspberry Pi

^{#1}Prashant Ashok Gilke, ^{#2}Kalpesh Anil Dahake,
^{#3}Dhirajkumar Eknathrao Dambare, ^{#4}Anil Pandurang Choudhari



¹prashantgilke@gmail.com
²kalpeshdahake123@gmail.com
³dhirajdambare@gmail.com
⁴choudhariap@gmail.com

^{#1234}Department of Electronics and Telecommunication
Sinhgad Academy of Engineering, Kondhwa(BK),Pune.

ABSTRACT

This project proposes a method for controlling a wireless robot for surveillance using an application built on Android platform. The Android application will open a web-page which has video screen for surveillance and buttons to control robot and camera. Android Smartphone and Raspberry pi board is connected to Wi-Fi. An Android Smartphone sends a wireless command which is received by Raspberry pi board and accordingly robot moves. The Video Streaming is done streamer program that gets jpeg data and sends it through a HTTP session. The Raspberry pi programming is done in python language. The experimental result shows that the video streamed up to 15 frames per second.

Keywords: Raspberry pi, Surveillance, Android Application , Wi-Fi.

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I. INTRODUCTION

India being an agrarian country where the farmers depend mainly on the ground water for the agriculture, deeper borewells are dug for groundwater abstraction. Borewells yield may reduce due to the over usage and continuous pumping for agricultural operations. Increasing of borewells in that particular area causes more groundwater stress which results in the bore will be dried up. In most of the cases, such borewells are relinquished that stance more noteworthy danger to human or creature wellbeing and furthermore cause serious groundwater contamination. Nowadays children regularly tumble down in the uncovered borewells and get trapped. These mischances are basically occurred because of heedlessness or fun loving exercises of the child, Moreover, a large portion of the drag wells are bored and left as it as open with no

appropriate covers. At the point when a child falls into the drag well, the current rescue operations in such a cases are less secure and turned into a non-safe to the save colleagues. The rescue operation for the most part comprises of three procedures: Approaching the Victim, handling the body and taking the child out of the well.

There is no proper technique to rescue victims of such bore well accidents. The existing technique[4] which involves digging the parallel hole to rescue the child next to the bore well in which the child has trapped actually. Moreover, it involves a lot of energy and expensive resources which are not easily available everywhere and in this process, we always need big space around the trapped bore that we can dig a parallel bore. These ad-hoc approaches involve heavy risks, including the possibility of injuries to the body of the

subject during the rescue operation. Also, the body may trap further in the debris and the crisis deepens even more means death.

In most cases, we rely on some make shift arrangements. This does not assure us of any long term solution. In such methods some kind of hooks are employed to hold the sufferers clothes and body. This may cause wounds on the body of the subject. The successive technique involves manual work. It is not only a time taking process, but also risky in various ways. The advent of new high-speed technology and the growing computer Capacity provided realistic opportunity for new robot controls.

Recently many accidents occurred in India. Forty five deaths of children have been reported in the country since September 2009[2], from that we have only nineteen with the proof of a newspaper(refer table no 2.1) After studying all the cases, we found a solution to do, which results a robotic machine which can go through the trapped bore well without any support.

Objective of the Project:

The objective of the project includes:

1. Wireless controlling of Robot technology
2. Live video can be seen.
3. Implementation of pick concept to the robot.
4. DC motor based gripper operation for robotic arm.

II. LITERATURE SURVEY

Sr.no	Paper	Author	Year	Description
1	Video surveillance robot control using smartphone and Raspberry pi	Ashish U. Bokade and V. R. Ratnaparkhe	2016	The Raspberry Pi is used to control robot using Smartphone from remote location. The time required for processing the commands from the smart phone and responding accordingly is negligible.
2	Wi-Fi Surveillance Robot Using Raspberry Pi	Harshal C. Chavan	2016	Using this robotic system a remote area can be monitored easily from remote end. One can easily monitor as well as control the activity of the robotic unit.
3	Industrial Vision Robot with Raspberry Pi using Pixy Camera	Gbenga Monday Omoisekeji	2018	Robots used in industrial work are not human, they are machines. They are programmable manipulator devices which can move tools or parts via a set sequence of motions.
4	Object Tracking Robot by Using Raspberry PI with open Computer Vision	M. Karthikeyan, M.Kudalingam	2016	The concept we used in this paper make use of raspberry pi kit along with web camera to track the colour object effectively. The robot movement here used along dc motor for accurate measurements.

III. METHODOLOGY

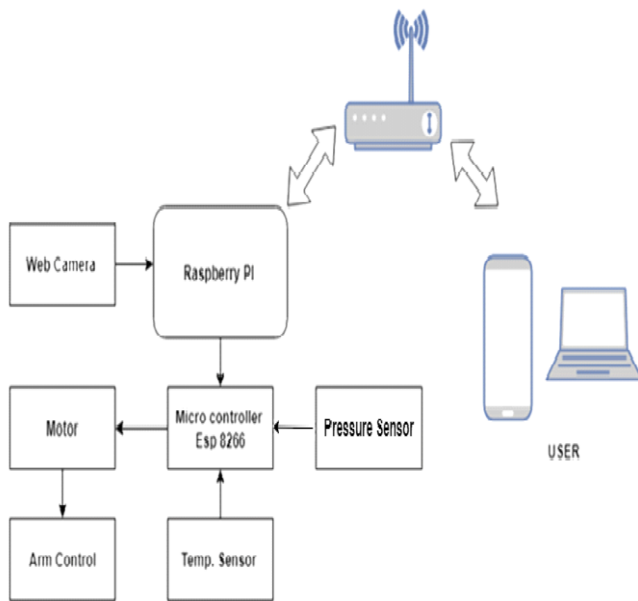


Figure1: Block Diagram of Robot to Rescue the Child from Bore Well System Using Raspberry Pi.

The first step is to allow the robot inside the bore well and then visualize the victim inside the bore well using wireless camera. The robot consists of 6 wheels and one upper wheel which give support to the robot to move along the wall. The wireless camera transmits the victim's situation to PC through ESP8266. The temperature sensor attached to the robot will send the temperature range inside the bore well to PC. The pressure sensor will detect the pressure and send it to the PC. By analysing the position of the victim, the robot arm is controlled and monitored through PC.

The robot arm will give the support to the victim. The robot movement and visualizing is controlled by Hyper Terminal software. After collecting all data, the balloon is moved further below the child and expanded using air compressor.

The balloon [3] which forms the basis to the child. The baby movements see through the lower camera and other data readings see through PC. Camera [8] is also capable of getting audio sound from inside the bore well. It is connected with Aux cables and wires are used to connect the

Camera with display and power supply for working of camera. An output display is also used to see the actual on time location of the child every time. It is a must requirement item in rescue of child trapped inside the bore well. Then slowly, the baby is moved upward by balloon. The medical team will be able to prepare for the treatment depending on the already seen temperature of the baby. Finally the victim is recovered from the bore well.

IV. COMPONENT DESCRIPTION

Raspberry pi:

Raspberry Pi2 is a single-board computer, which is equipped with a Broadcom BCM2835 SoC (System on Chip), which integrates a 700-MHz ARM117JZF-S core CPU (Central Processing Unit), 512 MB of RAM (Random Access Memory) and a Broadcom video core IV GPU (Graphical Processing Unit) [7]. The raspberry pi runs on Raspbian Jessie Operating System (OS) and the system runs on 16 GB (Giga Bytes) SD memory card.

LM35 Temperature sensor

LM35 is a temperature sensor with its output proportional to that of the temperature. The operating temperature range is from -55°C to 150°C . For every 1°C rise/fall in ambient temperature the output voltage varies around 10mV.

L293D Motor driver

L293D is a typical Motor driver which allows DC motor to drive on both directions. Two DC motors can be simultaneously controlled in both directions using the L293D which is a 16-pin IC. Its working concept is based on H-bridge. H-bridge is a circuit that allows the voltage to be flown in both the direction.

Digital Camera:

A webcam is video camera that feeds or streams its image in the real time to our computer through a computer network. When captured by the computer, the video stream may be viewed using the mobile application for analysis the bomb structure closely.

V. RESULT



Fig 2. Final hardware setup

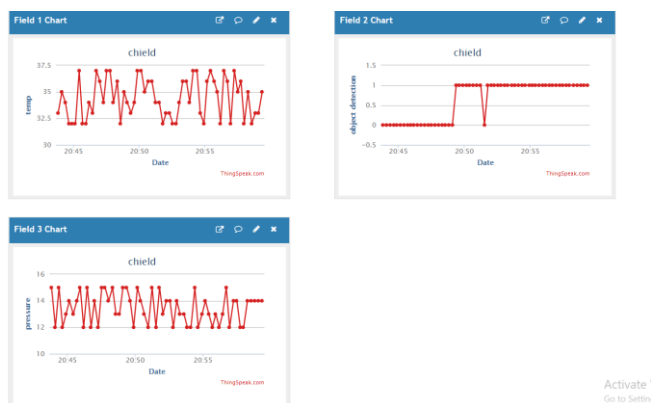


Fig 3. Result graph of temperature, pressure and object detection

VI. FUTURE SCOPE

In future we can utilize this venture in a few applications by adding extra segments to this undertaking. By associating smoke sensor to the robot we can get the data related convergence of smoke or gases in particular field's for example (coal mines, perilous zones, and so forth). Sensor sense the data and it provide for the miniaturized scale controller and it provides for the handset and from that we get the data in PC.

VII. 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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