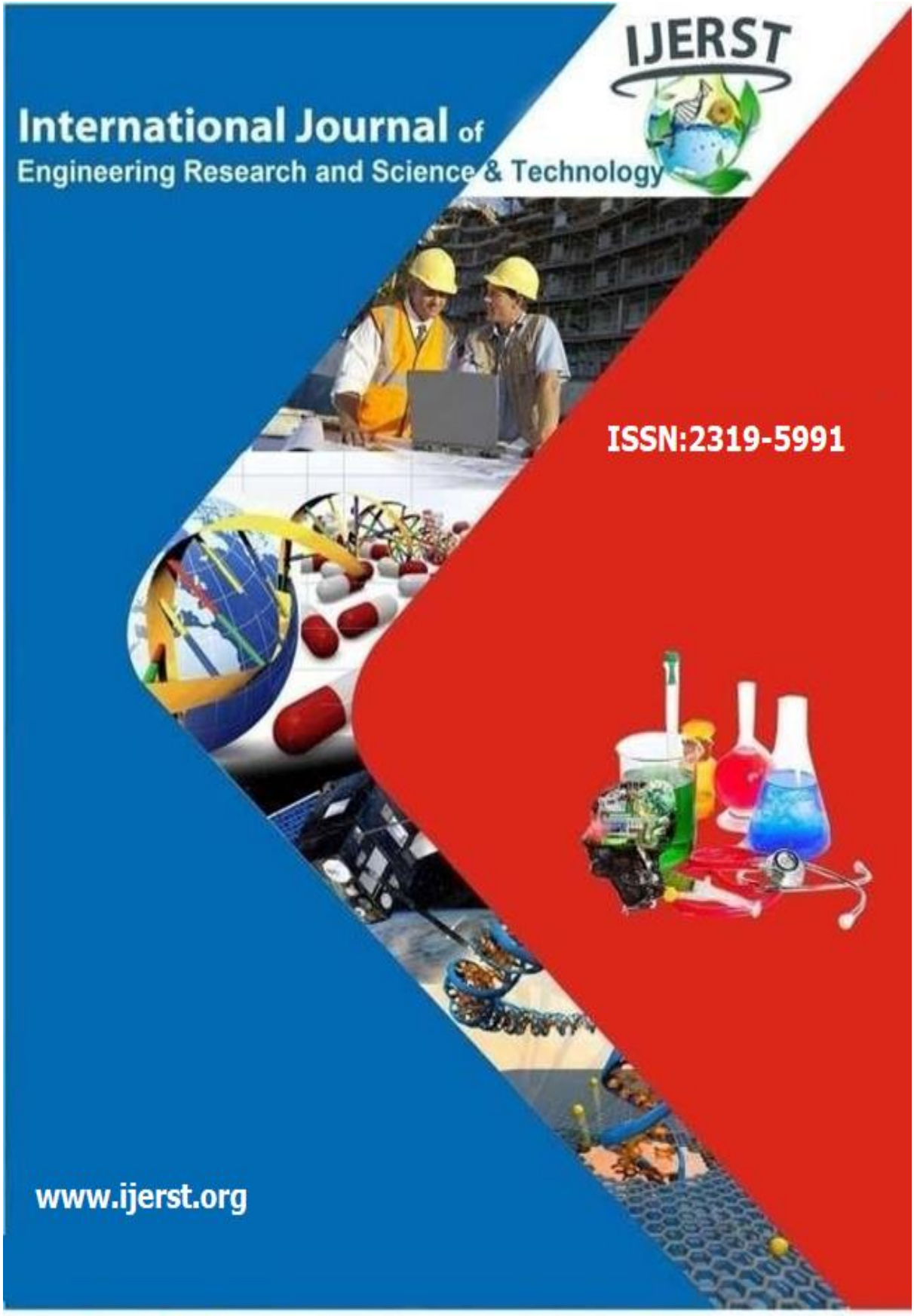


E-mail: editor@ijerst.org or ijerst.editor@gmail.com

International Journal of Engineering Research and Science & Technology

ISSN 2319-5991 www.ijerst.com
Vol. 21, Issue 2, 2025

CHILD RESCUE BORE HOLE ROBOT

Dr. P. VENKATA LAVANYA venkatalavanya@tkrcet.com
Associate Professor, TKR College of Engineering and Technology Meerpet, Hyderabad.
R. Mahesh, T. Gouri, V. Sai Kumar, Shaik Naseer
Dept OF ECE
ravulamahesh444@gmail.com, gouriterati@gmail.com,
vuresaikumar333@gmail.com, shaiknaseer5432@gmail.com.

ABSTRACT

The proposed system is to save life from the bore wells. Small children without noticing the hole dug for the bore well slip in and get trapped. Since the holes are dug too deep it is quite impossible to save life. The fire force and medical team find it difficult to rescue children due to unknown levels of humidity, temperature and oxygen in the depths of the bore well. Rescue work can be a long drawn affair lasting close to thirty hours. The time taken is long enough to kill a precious life. Even if rescued the child may die due to injuries sustained. This has created an open challenge to the field of medicine, rescue and the whole human society. To aid in such rescue we have proposed a system that will easily rescue within two hours of time without any major injury. By that a precious life can be saved.

I. INTRODUCTION

To develop a instant or a quick solution for the rescue operation performed when a child slips into a borewell unknowingly and gets stuck. This device mainly focuses on providing the required help to the child stuck in the bore well with minimum effort . Our key issue solved is reducing the time followed by the consequences.

Children often fall down in the borewell which have been left uncovered and get trapped. The rescue of this trapped children is not only difficult but also risky. A small delay in the rescue can cost the child his or her life. To lift the child out the narrow confines of the bore wells is also not very easy. The child who has suffered the trauma of the fall and is confined to a small area where, with a passage of time the supply of oxygen is also reduces.

International Journal of Engineering Research and Science & Technology

ISSN 2319-5991 www.ijerst.com

Vol. 21, Issue 2, 2025

II. LITERATURE SURVEY

a) Automated Borewells Rescue System

Authors: Arvind, S., Manoj, K.

Developed a robotic system with a flexible arm equipped with sensors and a camera to locate and safely retrieve trapped children.Real-time video monitoring.Highly efficient in straight borewells Limited mobility in narrow or curved borewells.

b) Design and fabrication of borewell child rescue system

Authors: Babu, P.,Kumar, S.

Designed a mechanical setup using a scissor-lift mechanism with soft gripping arms to lift the child Simple design and ease of use, Cost-effective solution. Limited adaptability to borewell depth variations.

c) IoT-Based Borewell Monitoring and Rescue System

Authors: Ramesh, V,.Singh, A.

Develop an IoT- based system for real- time monitoring of borewell conditions and a robotic mechanism for rescue operations.Remote monitoring through IoT. Efficient response mechanism. Requires internet connectivity for real-time data transmission.

d) Smart Borewell Rescue Robot with AI

Authors: Rajesh, S.,Gupta, N.

Incorporated artificial intelligence(AI) to predict child location and guide the robotic arm for precision rescue. Highly accuracy in locating the child.Adaptive to irregular borewell structures. High cost and dependency on AI algorithms.

III. ANAYLYSING AND DESIGN

PROPOSED SYSTEM:

1.Power Input (12V)

The system starts with a 12V DC power supply.

This voltage is stepped down and regulated to power the Node MCU (which typically needs 3.3V) and possibly other components (5V for motors, etc.).

2. Node MCU (Central Controller)

It receives commands (mostly from the Web) and controls output devices like

International Journal of Engineering Research and Science & Technology

ISSN 2319-5991 www.ijerst.com

Vol. 21, Issue 2, 2025

LEDs, Servo Motor, DC Motor, and Camera.

It act as the heart of the kit.

3. Web Control (Remote Control Interface)

Via Wi-Fi, the Node MCU communicates with a Web interface.

The user can send commands from the web (like turning ON/OFF LEDs, moving motors, or streaming camera feed).

4. Output Actions

Based on web commands or programmed logic, the Node MCU controls:

a) LED

Turns ON/OFF or changes brightness/blinking pattern of the LED.

b) Camera

Captures images or streams live video (if ESP32-CAM or similar is used).

This feed can be viewed on the web interface.

c) Servo Motor

Node MCU sends PWM signals to control the angle/position of the servo motor.

d) DC Motor (via Motor Driver)

Node MCU sends control signals to the Motor Driver (like L298N). The Motor Driver handles higher current needed for the DC Motor, making it rotate forward/reverse or adjusting speed.

IV. BLOCK DIAGRAM

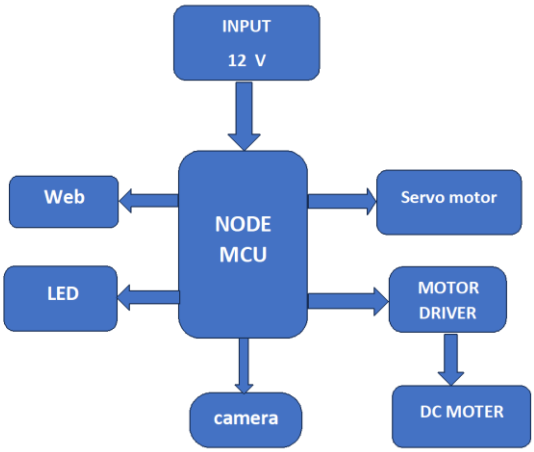


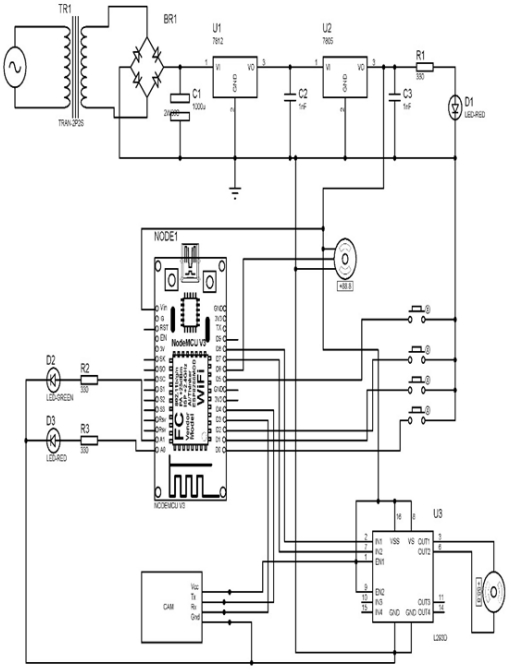
Fig 1: BLOCK DIAGRAM OF PROPOSED SYSTEM

V. SCHEMATIC DIAGRAM

International Journal of Engineering Research and Science & Technology

ISSN 2319-5991 www.ijerst.com

Vol. 21, Issue 2, 2025



International Journal of Engineering Research and Science & Technology

ISSN 2319-5991 www.ijerst.com

Vol. 21, Issue 2, 2025

VI. RESULT

PROJECT OUT LOOK

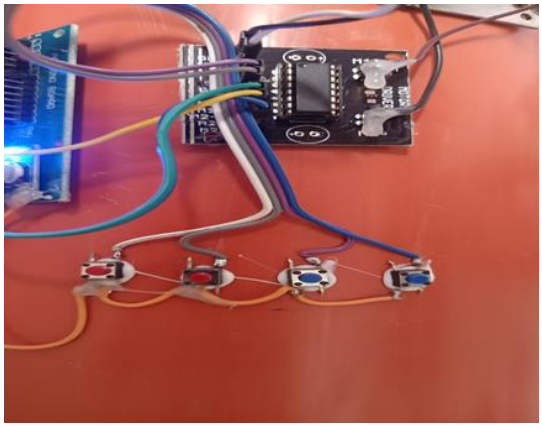


Fig 2: CONTROLLING MOTORS WITH ARDUINO

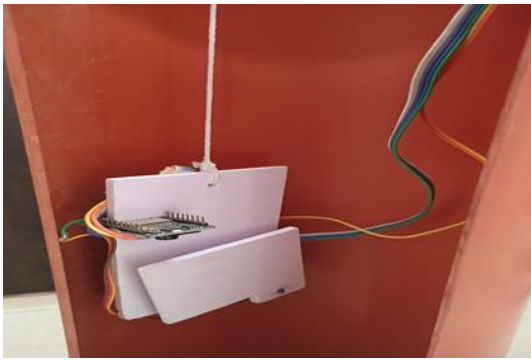
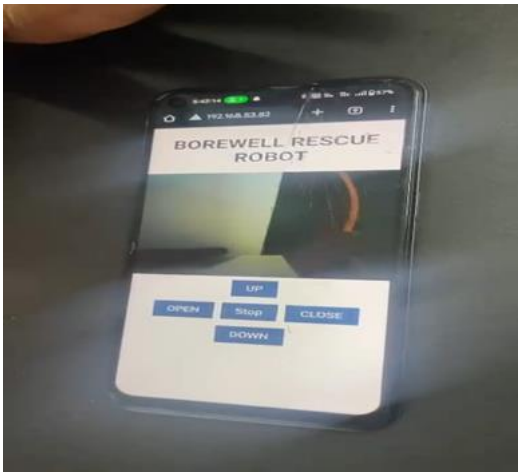


Fig 3:OUT LOOK OF THE SHEET WHEN CLOSED

Fig 4: OUT LOOK OF THE SHEET WHEN OPENED



International Journal of Engineering Research and Science & Technology

ISSN 2319-5991 www.ijerst.com

Vol. 21, Issue 2, 2025

Fig 5: A WEB-ENABLED CONTROL SYSTEM

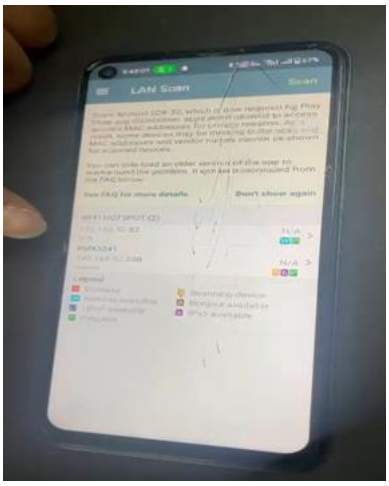


Fig 6: LAN DEVICE SCANNING

The heart of the project is the Node MCU (ESP8266), which controls all the operations of the system. A servo motor is used to operate a mechanical arm that can open and close, intended to grip or release objects or support a rescue mechanism. A DC motor is used to move the system up and down inside the borewell pipe. The direction and operation of the DC motor are controlled via an L298N motor driver module, which acts as an interface between the Node MCU and the motor.

For live monitoring, an ESP32-CAM module is used to stream real-time video. This helps the operator observe the condition inside the borewell. The system can be accessed through a mobile-friendly web page that is hosted on a local network. The web interface allows the user to control the movement and actions of the robot by pressing buttons such as UP, DOWN, OPEN, CLOSE, and STOP.

The kit is powered by a 5V power supply, which lights up the circuit and makes the components active. Manual buttons are also provided on the hardware for testing and offline operation.

VII. CONCLUSION

Working of Bore Well Rescue Robot has been successfully tested.

Need more modification for better pressure control, i.e. a better quality pressure controller is needed.

More improvement can be made on Robotic hand fingers by providing more cushioning system to grip the child trapped inside Bore Well.

Air bags can be used as a base below the Robotic hand fingers in order to lift the child from bore with more safety.

This project is based on pneumatic i.e. compressed air and hydraulic pressure which is much safer to use and easy availability.

Less costlier than other method (like digging a parallel bore to bore well where child is trapped) of rescuing child from Bore Well.

This project is very useful in developing a further advanced system which will result in rescuing a child from bore well.

VIII. REFERENCES

1. Kumar, S., & Karthik, A. (2018). *Design and Fabrication of Child Saver Machine in Borewell.* International Journal of

International Journal of Engineering Research and Science & Technology

ISSN 2319-5991 www.ijerst.com

Vol. 21, Issue 2, 2025

Engineering Science and Computing, 8(4), 17170–17173.

2. Pandey, R., & Varma, S. (2020). *A Review on Child Rescue System from Borewell Using Robot.* International Journal of Innovative Research in Science, Engineering and Technology, 9(2), 1234-1240.
3. Sivakumar, M., & Kumar, S. (2017). *Automated Borewell Rescue System.* International Journal of Mechanical and Production Engineering Research and Development (IJMPERD), 7(5), 45–52.
4. Gupta, A., & Pratap, D. (2016). *Borewell Rescue Robot: A Review.* International Journal of Scientific & Engineering Research, 7(5), 250-254.
5. Suthar, K., & Patel, H. (2015). *Design and Analysis of Bore-Well Rescue Robot.* International Journal of Advance Engineering and Research Development, 2(4)103-109