SUPER BHEEM-THE LIFE SAVING IDEOLOGY

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Introduction:
In India, Drought and water scarcity has led to large number of borewells being dug. Once the water gets depleted these borewells are left abandoned and uncovered which becomes death pits and takes many innocent lives. In the recent years there is an increase in number of children falling into borewells due to the carelessness and playful activities of the children. The holes dug for these borewells are deep. The rescue of children from such deep borewells is quite challenging and also risky. Since lot of time is required for rescue operation, it can cost a child’s 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 the main risk for child’s life. There are certain solutions available for rescuing from such incidents but they don’t yet guarantee life. There is no proper technique to rescue victims of such incidents. In most cases reported so far, a parallel hole is dug and then horizontal path is made to reach the child. It is not only a time taking process, but also risky in various ways. Moreover, it involves a lot of energy and expensive resources which are not easily available everywhere and it needs big space around the trapped bore so that a hole can be dug parallel to borewell where the child has been trapped. These approaches involve heavy risks, including the possibility of causing injuries to the child during the rescue operation. This does not assure any long term solution. In such methods some kind of hooks are employed to hold the victim’s clothes and body. This may cause wounds on the body of the child. After studying all the cases it is found that it is a serious issue to be dealt with and it has motivated to propose a better idea where in metal stakes are added at a minimum length with safety airbags on them to prevent the child from falling deeper into the borewell. After which special graspers are sent to grasp the trapped child without causing any damage to the child’s body.

Objectives:
The main objective is to rescue the child fallen in the borewell. This is done with the help of metal stakes, safety airbag and special graspers, consuming minimal time. A high resolution camera also plays a very important role of continuous monitoring of the child’s position. Other objectives are:
- Manually monitoring the child with the help of high resolution camera and controlling unit.
- Communicating with the graspers by sending appropriate commands to it and activate the suitable motors.
- Once the graspers has reached proximity of child, it is stopped immediately and is given the commands by the controlling device to perform the closing of the graspers to lift the child.
- Child is saved immediately with minimal time and reduced risk.
- The live streaming of the rescue process can be viewed in an Android device.

The proposed system “SUPERBHEEM-THE LIFE SAVING IDEOLOGY” helps in rescuing the child fallen into abandoned borewells. Majorly done by reducing time consumption, reducing machinery, reducing work load, reducing risk and so on. It gives more guarantee to the child’s life compared to the existing manual rescue system or the borewell crane system.
Methodology:

Materials

Hardware Requirements

- Mechanical unit.
- NODE MCU
- Camera
- IR sensor
- DC motor
- Rack and pinion mechanism
- Control unit
- Rescuer device
- special graspers.
- Android phone

Software Requirements

- Embedded C
- Arduino IDE

Methodology:

In proposed technique IR technology is efficiently used to identify the child falling in the borewells. We use a 38 KHz PWM sine wave to drive the IR LED to beam a continuous signal, which directly falls on the IR receiver. The output of the IR receiver is high when the IR signal transmitted by the IR transmitter falls on the IR receiver. Whenever the IR beam breaks during the child fall the output of the IR Receiver is low, which drives a sensing circuit to close the metal stake, this is done before the child reaches the 5 feet depth below the ground level. Because at 5 feet level the oxygen levels are enough to survive very long period. The metal stakes are attached with airbags for extra safety for protecting the child from getting hurt. The special graspers are used to bring the child out of the borewell. Here the IR sensor is the input stage and metal stakes closing, rescuing operation, and camera used for live streaming will be controlled with NODE MCU and DC motor will be done in processing stage. The rescue operation will be live streamed on a android device for better rescuing in output stage.

Figure: Architecture Design

Details of work carried out including drawings and diagrams:

The technique proposed prevents the child’s death in the bore-wells, as the technique stops the child at a certain depth in the bore well and prevents from falling more deeper in to the bore-well. In the proposed technique IR technology is efficiently used to identify the child falling in the bore wells. Here we used a 38 KHz PWM sine wave to drive the IR LED to beam a continuous signal, which directly falls on the IR receiver. The output of the IR receiver is high when the IR signal transmitted by the IR transmitter falls on the IR receiver. Whenever the IR beam breaks during the child fall the output of the IR Receiver is low. Which drives a sensing circuit to close the metal stake, this is all done before the child reaches the 5 feet depth below the ground level. The main reason for keeping the metal stake at 5 feet below the ground level is to provide the sufficient time to the control circuit to close the metal stake and at 5 feet 3980 N. Even the infants who are in sudden trauma could get good amount of oxygen to recover from trauma. If no one identifies the child fall in the bore well or any delay during the rescue operation, there will be no chance to
lose their life. Because at 5 feet level the oxygen levels are enough to survive very long period, even may be
days. The metal stakes are attached with airbags for extra safety for protecting the child from getting hurt. The special graspers are used to bring the child out of the borewell. These special graspers adjust according the width and length of the child. The special graspers move up and down to reach the child. The rescue operation will be live streamed on a android device for better rescuing.

Figure: Cross-sectional view with fabrication

Results and conclusion:

Results
This prototype has been designed keeping the possible practical issues in mind.

- SuperBheem is designed to give the conceptual scenario in the situation of rescuing child from borewell. The child is rescued within few hours instead of wasting days on it.
- It can be used by the government for rescue operation.
- It can be operated by using android device, the child is safely brought up with the special graspers which will be communicating with the android device and also the position of the child can be streamed with high resolution camera onto the android device. Hence the risk to child’s life is reduced.

Conclusion :
“Human life is precious” – This is a statement we always hear because life is important to each one of us. Neither we want to lose our life nor lose any of our beloved lives. We usually want to do everything for one’s safety. Keeping this in mind SuperBheem was developed to save a child’s life because children are precious, so does their life is. Listening to such incidents of children losing their life is a great heartbreak. So Borewell child saver is a significant attempt to save life of the victims especially children. Understanding the issues of the existing rescuer model and understanding needs and requirements of a better rescuer model lead to the planning and development of SuperBheem. In the current design, SuperBheem has been made to suit every possible situation that may occur in rescue operation be it place, time, situation, equipments, rescuers etc. It reduces human efforts for rescuing the child from the bore well. It performs rescue operations in very less time as compared to traditional methods. This is the major solution to the long hours of rescue as this comparatively offers more safety and guarantee of saving child’s life. Thus, it has been designed keeping the entire obstacle in mind that may arise during the operation. Hence we can conclude that the name given to this project i.e. SuperBheem – The Life Saving Ideology is justified as it is definitely the major idea done to save a life.

Future scope:
In future we can use this project in several applications by adding additional components to this project.
- A mesh structure can be designed in order to prevent foreign particles falling on the baby.
- We can implement this project in apartments, individual residences into their sumps so that we can prevent a child by falling in.
- By connecting temperature sensors, smoke sensors to the device we can get to the temperature and information related to concentration of gases and smokes of dangerous zones, field’s like (coal mines, etc...).
- This project can be further extended for the use of bomb diffusion.

The rack and pinion mechanism can be equipped with some scrubbing components so it can clean underground tanks. In order to get high resolution images of mines, under water life etc., a vacuum unit can also be added in order to suck dirt particles.