



Basic Details of the Team and Problem Statement

Ministry/Organization Name/Student Innovation:

Ministry of Home Affairs

PS Code: SIH1439

Problem Statement Title:

Robotics Device for Borewell Rescue Operation

Team Name: TEAM RESCUERS

Team Leader Name: Ashish Prabhakar Shinde

Institute Code (AISHE): C1109

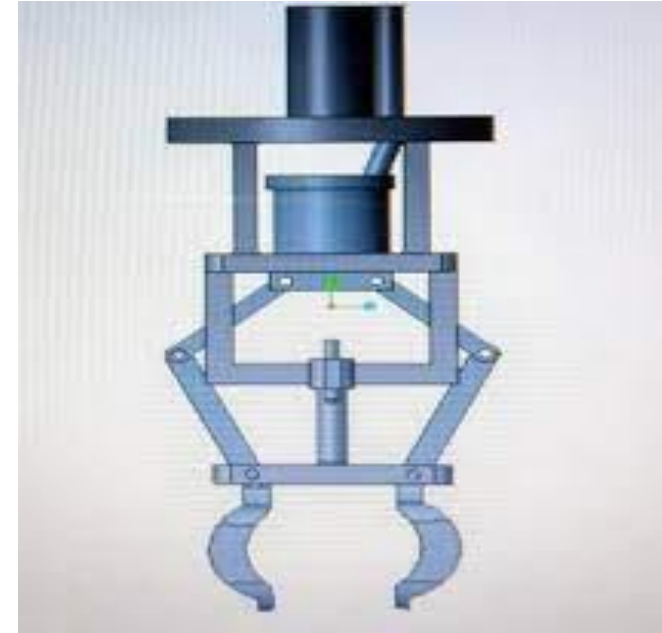
Institute Name: Government College of Engineering Karad

Theme Name: Disaster Management

Idea/Approach Details

Describe your idea/Solution/Prototype here:

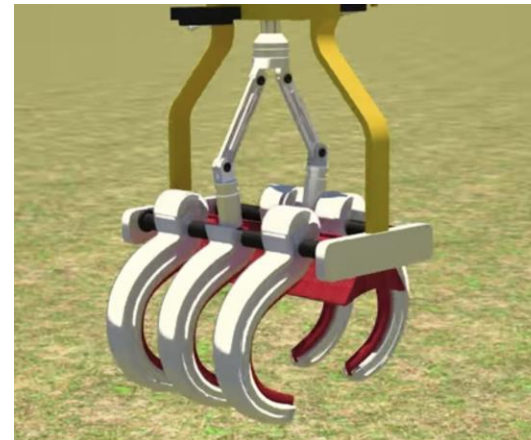
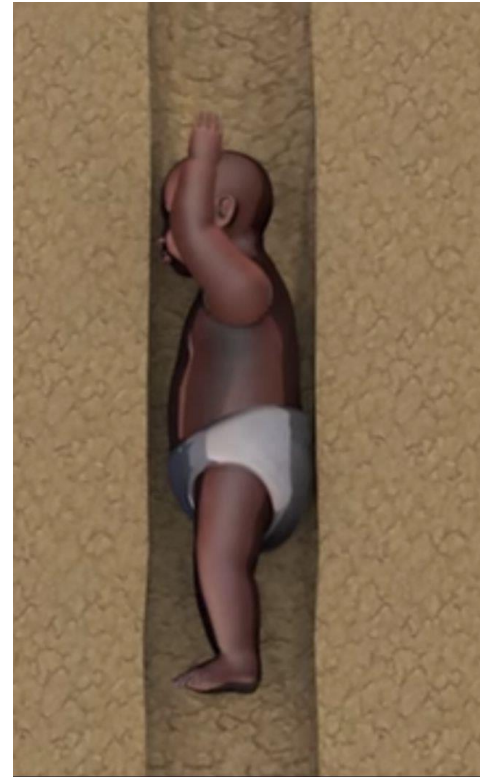
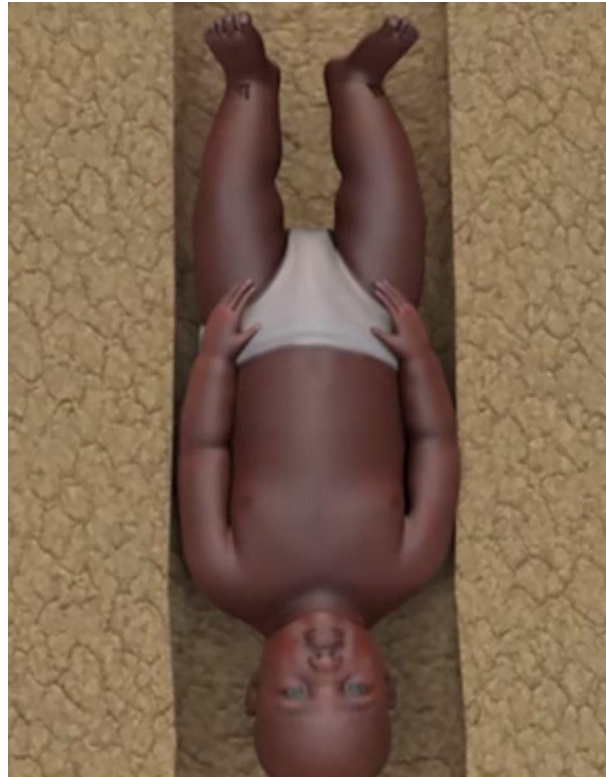
- 1) The Borewell Rescue Robot involves designing a robot capable of navigating narrow and deep borewells to rescue individuals who may be trapped.
- 2) The Bore well Rescue Robot is capable of moving inside the well and performs operations according to the user commands.
- 3) The proposed model is designed to provide the child with two level of safety achieved by using robotic holding at the top and safety supporting base at the bottom.
- 4) The robot is operated by the human manually and monitor in computer .According to the observations made continuously using CCTV camera.
- 5) We are also providing the Oxygen supply through it.



• Describe your Technology stack here:

- 1) Control algorithms for motor control, including forward and inverse kinematics.
- 2) Software interfaces to collect and process data from various sensors
- 3) A user-friendly interface for operators to control the robot, visualize data from sensors, and send commands

Position of a Kid



Idea/Approach Details

- Describe your Use Cases here

1) Child Rescue :

These robots are designed to reach the child, assess their condition, and provide necessary assistance until they can be safely extracted.

2) Rescue in Confined Spaces :

Borewell rescue robots can be used in various confined spaces, not just borewells. They are valuable in scenarios where humans cannot easily access or where it's too risky for rescuers.

3) Assessment :

It is equipped with cameras and sensors that allow rescue teams to assess the situation underground. This helps in making informed decisions and communicating with the trapped ones.

- Describe your Dependencies / Show stopper here

1) Electronics and Hardware:

Dependence on electronic components such as Arduino, sensors (e.g. cameras), stepper motors, arm and power sources (batteries or other energy sources).

2) Software :

Programs for Arduino.

Advancements

1. Shield for fixing the position of robot in the borewell
2. Ultrasonic / Radar sensor for calculating the depth of the stucked kid.
3. Oxygen and CO2 sensor
4. Oxygen supply if required
5. Heartbeat or Pulse rate sensor
6. Mic and speaker for communication purpose
7. Airbags for extra safety

Other Applications

1. Coal mines rescue robot

i) Work on the ground surface and can assist rescuers find and interact with trapped victims, in areas where it is dangerous or difficult for rescue personnel to enter.

ii) Functional requirements of mine rescue robots

- a. Searching
- b. Inspection and mapping
- c. Structural inspection

Prototype Design



Team Member Details

Team Leader Name: Ashish Prabhakar Shinde

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|----------------|---------------|------------|
| Branch - Btech | Stream - EnTC | Year (III) |
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Team Member 1 Name: Aditya Chandrakant Chougule

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| Branch - Btech | Stream - EnTC | Year (III) |
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Team Member 2 Name: Suyog Jayavant Kale

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| Branch - Btech | Stream - EnTC | Year (III) |
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Team Member 3 Name: Rahul Narendra Wankhade

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| Branch - Btech | Stream - EnTC | Year (III) |
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Team Member 4 Name: Suraj Dinkar Pawar

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| Branch - Btech | Stream - EnTC | Year (III) |
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Team Member 5 Name: Gauri Ramesh Dahikar

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|----------------|---------------|-----------|
| Branch - Btech | Stream - EnTC | Year (II) |
|----------------|---------------|-----------|

Team Mentor 1 Name: Type Your Name Here

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| Category (Academic/Industry): | Expertise (AI/ML/Blockchain etc): | Domain Experience (in years): |
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