COMED KARES
INNOVATION HUB

MANGALORE CENTER

AUTONOMOUS ROBOT WITH ACCIDENT PREVENTION SYSTEM

PROBLEM STATEMENT

The project aims to enable the robot to navigate unknown environments, detect obstructions based on a predetermined threshold distance, and autonomously shift its trajectory to avoid collisions. The robot should operate without external control, measure real-time distances from obstacles, and potentially incorporate Bluetooth and voice control options.

TEAM MEMBERS

Divyanidhi rai, EC
Deekshith s, EC
Hitha shetty, EC

Preethi Prabhu.k, EC
Sagar Pingle, EC
Santosh Kumar, EC

SOLUTION

The team has developed an obstacle avoiding arduino robot with bluetooth and voice control for automatic obstacle detection and avoidance. Utilizing an ultrasonic sensor for obstacle avoidance, the robot seamlessly maneuvers through its environment. Bluetooth technology, facilitated by the HC-05 module, enables smartphone app control, providing a user-friendly interface. Additionally, the robot responds to voice commands, further enhancing its versatility.
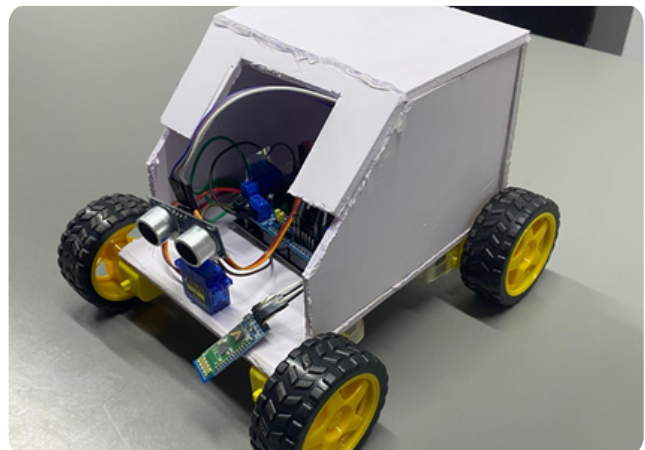
RESQ–BOT: A VERSATILE SMART DEVICE FOR HAZARDOUS SEARCH AND RESCUE OPERATIONS

PROBLEM STATEMENT

As natural disasters and hazardous situations become increasingly prevalent, there is a pressing need for a sophisticated rescue operation robot. Traditional rescue methods are often hindered by dangerous conditions, making it imperative to develop a versatile and efficient robotic solution capable of navigating challenging environments to save lives and mitigate risks.

TEAM MEMBERS

Harshitha G, EC
Deekshith C Achar, EC
Prashank Poojary, EC

Megharsha M s, EC
Shreya, EC

SOLUTION

The Raspberry Pi-powered rescue robot is a solution equipped with ultrasonic and IR sensors for enhanced disaster response. Using Raspberry Pi's computing prowess, it can navigate environments, detecting obstacles through ultrasonic and IR sensors. Powered by a LIPO battery, this agile robot ensures extended operational capabilities, providing a reliable and versatile tool for rescue operations in challenging and dynamic scenarios.

RECON ROVER : A ROBOT FOR MILITARY APPLICATIONS

PROBLEM STATEMENT

The problem at hand revolves around the heightened risks and challenges encountered by human soldiers in contemporary military operations, particularly in hazardous and unpredictable settings. The absence of autonomous robotic systems proficient in surveillance, reconnaissance, and tactical functions hinders operational efficiency, jeopardizing the safety of military personnel. Addressing this gap is imperative for enhancing mission success and minimizing human casualties.

TEAM MEMBERS

NSyed Nabeel Hussain   **Aadil Nazeera Gundagi**
Mohammed Fayeem   **Mohammed Thahseen**
M H Muhammad Rizwan

SOLUTION

The military robot integrates key hardware and software components. Hardware features encompass advanced computer vision for object detection using Raspberry Pi 4, poison gas sensing, versatile mobility, and infrared sensors. Software elements include real-time algorithms for object detection, gas identification, mobility control using ultrasonic sensors.

ARECA NUT SORTING MACHINE FOR THE ARECA NUT HARVESTERS

PROBLEM STATEMENT

The current manual sorting of Areca nuts poses challenges for harvesters, being labor-intensive, time-consuming, and inconsistent, impacting productivity and quality. Efficient segregation based on size, color, and quality is challenging, affecting market value. To address this, there is a critical need for an automated Areca nut sorting machine. This solution aims to streamline the process, boost productivity, and ensure consistent quality, ultimately enhancing market competitiveness and alleviating the persistent challenges faced by Areca nut harvesters.

TEAM MEMBERS

Sujnan Kumar, EC　　　　**Vijay, EC**
Nishanth, EC　　　　　　 **Gowri P Shetty, EC**
　　　　　　　　　　　　　　 Kishan S S, EC

SOLUTION

The automated arecanut sorting machine represents a transformative shift from manual methods, harnessing the power of automation, including technologies like computer vision, sensors, and Raspberry Pi. This integration ensures precise sorting based on size, color, and quality, minimizing errors and elevating end product quality. By automating the process, it reduces labor requirements, accelerates processing speed, and contributes to long-term cost savings, exemplifying a modernized and economically sustainable approach to agricultural processes.
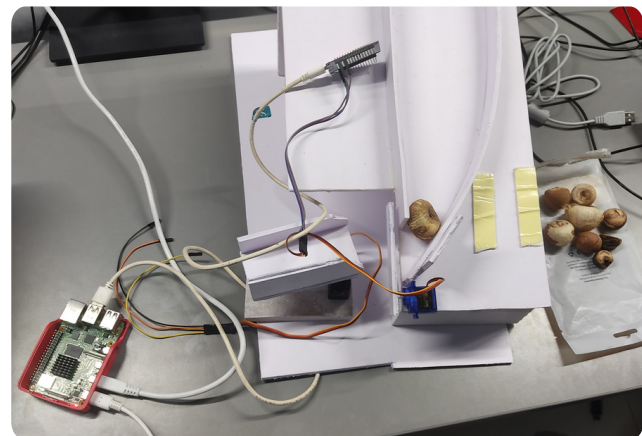
GESTURE BASED COMMUNICATION SYSTEM FOR DUMB, DEAF

PROBLEM STATEMENT

Existing hearing impairment solutions suffer from insufficient user satisfaction due to challenges like inaccurate speech recognition, discomfort from bulky devices, and a lack of seamless integration into daily life. These limitations impede the effectiveness and acceptance of current solutions, significantly affecting the quality of life for individuals with hearing impairments. Addressing these issues is crucial for developing more effective and user-friendly solutions that can genuinely enhance the lives of those with hearing challenges.

TEAM MEMBERS

Kanishk D Amin, EC
Ajeeth, EC
Adarsh.N.Manjrekar, EC

Reshma S, EC
Nishanth gowda CJ, EC

SOLUTION

The Gesture-Based Communication System, tailored for individuals with hearing and speech impairments, focuses on the deaf and mute community. Employing flex sensors positioned on a wearable glove, the system adeptly captures and interprets intricate hand gestures inherent to sign language. Enhancing communication, the system integrates an LCD display for real-time feedback. This innovative project holds promise in bridging communication gaps and empowering individuals with hearing and speech impairments to express themselves effectively through the use of gesture-based technology.
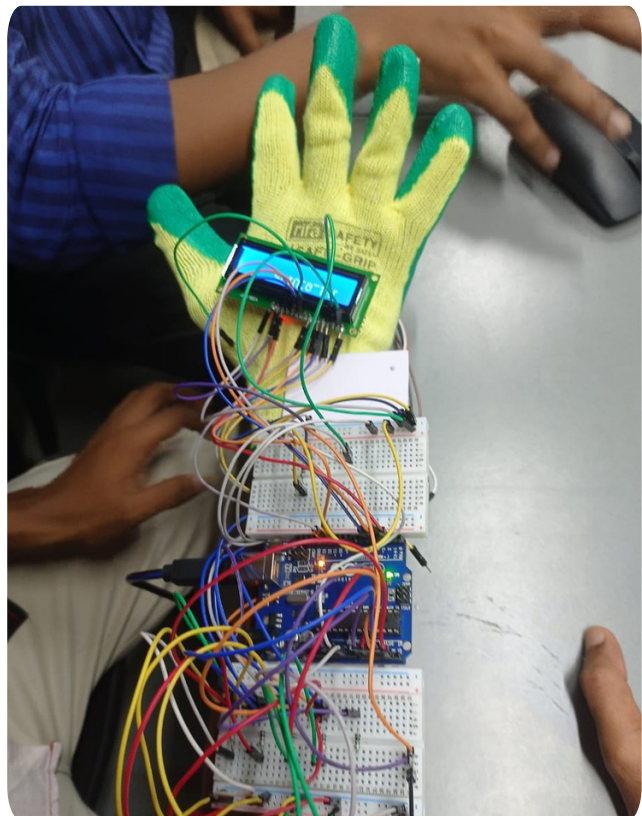
GARBAGE SEGREGATOR

PROBLEM STATEMENT

The challenge at hand is to create an efficient waste segregator system capable of automatic and accurate classification of mixed waste items into distinct categories. Currently, the absence of such a system hinders effective waste management. There is a pressing need to address this issue by developing a technology-driven solution that streamlines the waste segregation process, ensuring precision and facilitating proper disposal or recycling of different waste types. This problem statement underscores the demand for an innovative approach to enhance waste management practices.

## TEAM MEMBERS

Nithin M.R, EC
Deeksha D Shetty, EC
Sayyad Arif, EC

Alfred Jeevan Dsouza, EC
Swathi singh, EC

SOLUTION

The waste management solution incorporates waste segregators with a sorting mechanism, driven by a Raspberry Pi board for motion control. This design enables efficient segregation of organic, recyclable, and non-recyclable materials at the source. Implemented in households and businesses, it promotes environmental conservation, community engagement, compliance with regulations, and resource recovery. The Raspberry Pi-driven system reduces landfill usage, ensuring a sustainable and responsible waste management approach.

COMEDKARES STUDENT REPROT
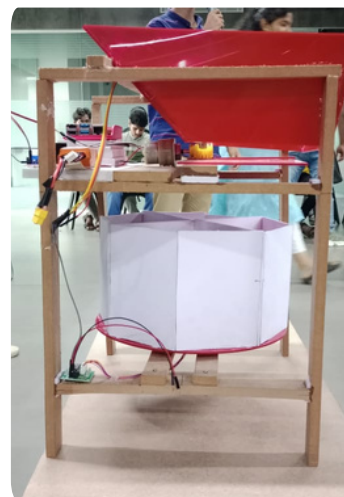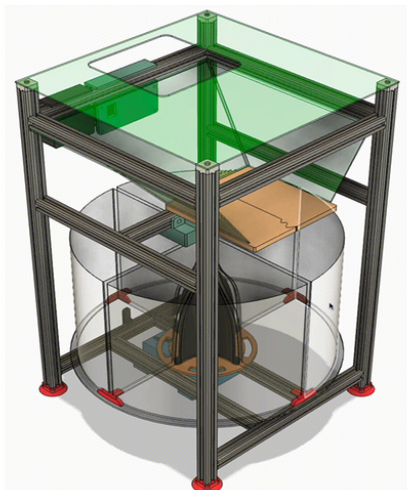
MULTI PURPOSE WHEEL CHAIR

PROBLEM STATEMENT

Manual wheelchairs pose challenges for users, impeding mobility and independence. Issues include strenuous self-propulsion, limited terrain adaptability, and inadequate ergonomic design. These shortcomings hinder daily activities, compromise user well-being, and demand a more innovative, user-centric approach to enhance the functionality and comfort of manual wheelchairs.

TEAM MEMBERS

Keerthiraju S R
PRAKASH

B V Deepika Shetty
Muhammed Aman C

SOLUTION

Empowering independence, the Multipurpose Wheelchair is a cutting-edge, motion-controllable system that integrates crucial health monitoring features. A continuous Heart Rate Monitor, coupled with a pulse sensor connected to an Arduino Uno, tracks vital signs. Further, dedicated Temperature and Humidity Monitoring Systems enhance the user-centric healthcare approach. By incorporating controllable wheelchair features, this holistic solution prioritizes autonomy, aiming to elevate the well-being and mobility of individuals.

MEDICINE DELIVERY BOT: ENHANCING SAFETY AND EFFICIENCY IN ISOLATED PATIENT CARE

PROBLEM STATEMENT

Addressing the need to minimize disease spread and reduce patient–healthcare worker interactions, the challenge arises when healthcare workers must personally deliver medicines to isolated, infected patients. The stakeholders, patients, and hospitals aim to enhance safety. The current metric involves healthcare workers delivering medications, but the goal is to implement a bot capable of transporting medicine and food. This aims to prevent healthcare workers from potential infection, all while considering financial and material constraints.

TEAM MEMBERS

Kartik Maruti Shetti
Neha Dinesh

TP Vishwanath Shenoy
Drishya Devanand

SOLUTION

Their innovative solution involves the creation of a HealthCare Delivery Bot, powered by Raspberry Pi, to counter workforce shortages amid the COVID-19 pandemic. This robot adeptly handles healthcare tasks like delivering medications and PPE, mitigating infection risks and easing the strain on healthcare workers. Equipped with autonomous navigation capabilities through sensors and cameras, the bot ensures safe and efficient deliveries, embodying a practical and technological response to the challenges posed by the pandemic, benefitting healthcare facilities and their personnel.
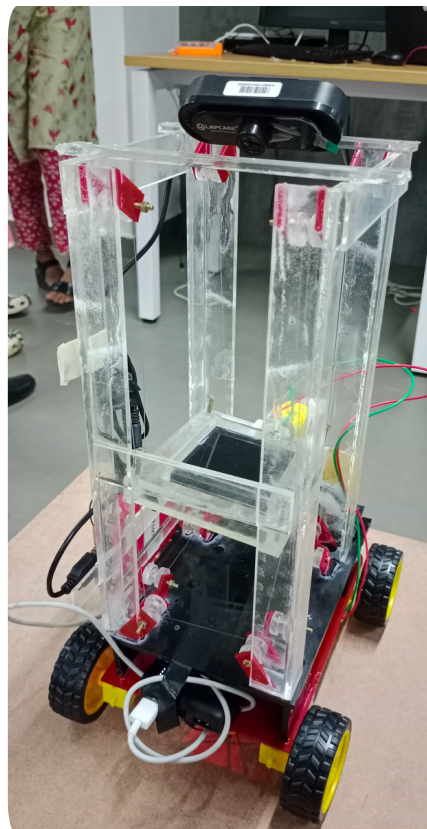
AUTOMATED VEHICLE CHARGER: AUTOMATED CHARGING FOR SEAMLESS EV CHARGING EXPERIENCES

PROBLEM STATEMENT

The challenge lies in the difficulty faced by new electric vehicle users in comprehending the charging process, coupled with potential time wastage due to insufficient staff at charging stations. Despite the presence of components and stations, a need arises to contribute to charging station owners and electric vehicle users by introducing automated charging equipment with robotic arms. The current manual charging method poses delays, and the goal is to transition to an automated system, benefiting both vehicle owners and station operators by minimizing waiting times, subject to component and station availability.

TEAM MEMBERS

Gurudeep   **Sejal D**
Ankitha   **Sinchana bangera m**

SOLUTION

The vision of automated vehicle chargers autonomously navigating to the vehicle ports for charging promises a transformative future for electric vehicle (EV) charging infrastructure. Anticipated outcomes include optimized space utilization at charging stations, potentially enabling more points in congested urban areas. The automated system's precision in aligning with charging ports is expected to enhance efficiency, facilitating faster and more effective charging sessions. Reduced human intervention promises seamless and cost-effective charging, while prioritizing safety through robust system design ensures the well-being of both vehicles and pedestrians in the charging station vicinity.

COMEDKARES STUDENT REPROT
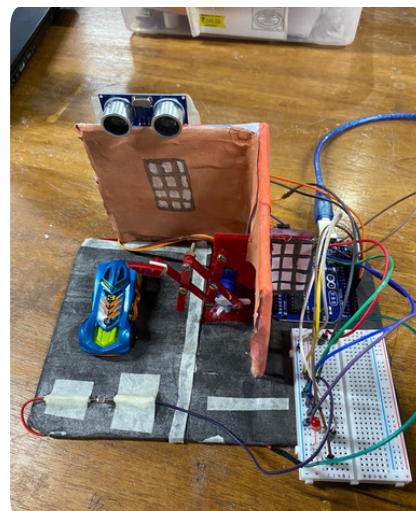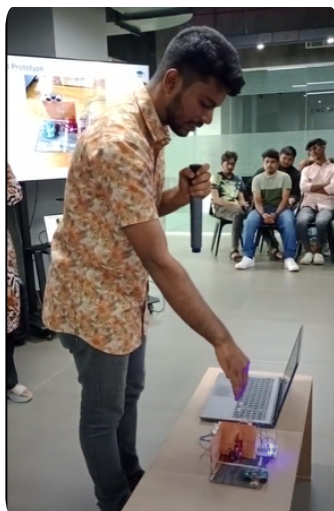
SEMI–AUTONOMOUS TRASH COLLECTION BOT: ADVANCING URBAN WASTE MANAGEMENT.

PROBLEM STATEMENT

The pervasive issue of floating waste in rivers signifies a critical environmental concern. Widespread disposal of non–biodegradable materials, particularly plastics, threatens aquatic ecosystems, degrades water quality, and endangers biodiversity. This escalating problem requires immediate attention to mitigate its detrimental impact on rivers, urging effective waste management solutions and heightened public awareness.

TEAM MEMBERS

Charan   **Sathwik M S**
Gopalakrishna B **KSHITHIJ H S**
ANIRUDDHA WAGLE K **Sanjay**

SOLUTION

The team has engineered a prototype conveyor belt system to establish an efficient collection mechanism for addressing the challenge of floating waste in rivers. This innovative technology utilizes an automated conveyor belt, enabling the robot to navigate river environments and effectively gather debris, particularly plastics. The prototype represents a significant step forward in addressing environmental concerns and underscores the potential impact of student–led initiatives in waste management.
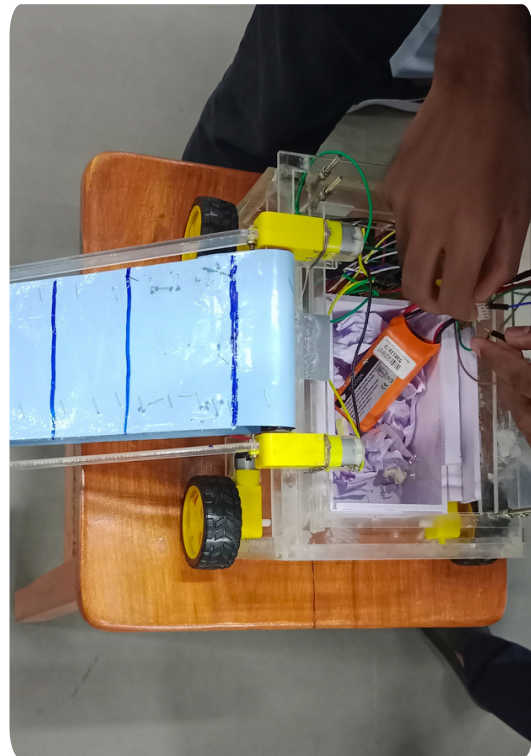
AUTO SAFETY ROBOTIC BOT: PROACTIVE COLLISION AVOIDANCE SYSTEM

PROBLEM STATEMENT

The core objective is to design an Arduino-integrated vehicular robot dedicated to preventing accidents with static obstacles. The project focuses on mitigating collisions with stationary elements like poles or barriers. The aim is to furnish these robots with advanced systems for obstacle detection, collision risk assessment, and autonomous maneuvering to avert accidents. This demands a resilient system integrating sensors, responsive controls, and precise algorithms for instant obstacle recognition and ensuring secure navigation on the road.

TEAM MEMBERS

Divyanidhi Rai
Sagar Pingle
Santosh Kumar

Hitha Shetty
Preethi Prabhu.k
Deekshith. S

SOLUTION

The Arduino-integrated vehicular robot features an advanced accident prevention system for static obstacles, utilizing sensors for environment detection. With swift responses like stopping or changing direction upon detecting obstacles, this system enhances safety and reliability. Ideal for autonomous navigation, security, and automation, it significantly reduces accident risks and ensures efficient operation in static obstacle-filled environments.
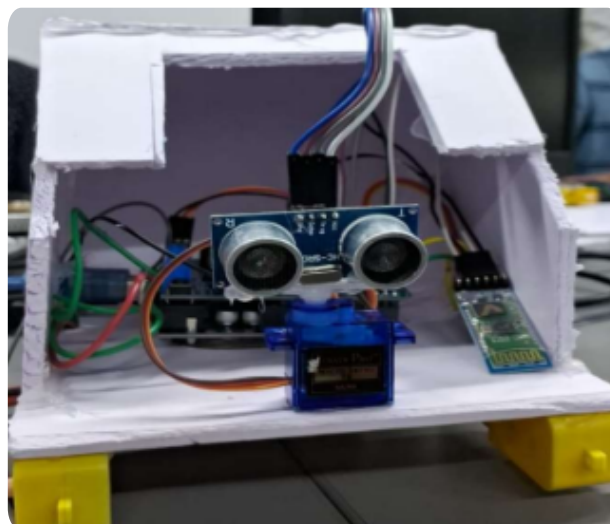
AUTOMATED SORTING SYSTEM FOR INDUSTRIAL PROCESSES

PROBLEM STATEMENT

Creating an automated sorting system presents the complex task of seamlessly integrating into industrial workflows. The system must adeptly classify diverse materials or products based on predetermined criteria, requiring precision, speed, and adaptability to accommodate fluctuating production demands. Ensuring efficient and error-free sorting within industrial processes is paramount for streamlined operations. This multifaceted challenge demands a solution that harmonizes with dynamic production environments while upholding the accuracy and speed required for effective material or product categorization.

TEAM MEMBERS

Dhanush shetty
Harismitha
Vinith kamath G

Charan Raj B H
Shashank hr

SOLUTION

The Automated Sorting System, utilizing Raspberry Pi, OpenCV, DC motors, and servo motors, offers an efficient solution for color-based object sorting in industrial processes. This automated system addresses the needs of diverse industries such as manufacturing, logistics, and recycling. With Raspberry Pi as the core controller and OpenCV facilitating precise color recognition, the system streamlines sorting operations. Its versatility makes it a valuable asset across various sectors, providing an innovative and adaptable approach to enhance efficiency in industrial processes.
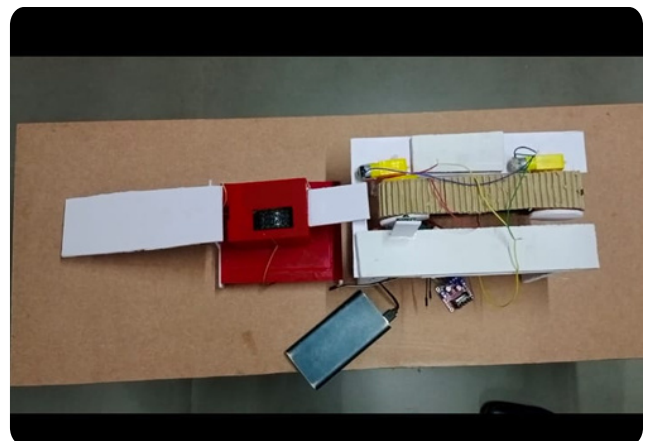
HOME SECURITY PROTOTYPE FOR INTRUDER DETECTION

PROBLEM STATEMENT

The increasing frequency of residential break-ins poses a critical security challenge for homeowners. Traditional security measures may prove inadequate in deterring modern burglary tactics. With the growing sophistication of criminals, there is a pressing need to develop and implement advanced, cost-effective home security solutions that provide comprehensive protection, ensuring the safety and peace of mind for residents.

TEAM MEMBERS

Deviprasad AV
Gagan A Rai
Ujwal Shetty

Prajwal Raikar
Deekshitha

SOLUTION

Our innovative home security solution tackles the challenge by implementing a comprehensive prototype. We combine a Passive Infrared (PIR) sensor, Raspberry Pi, Raspberry Pi Camera, and a buzzer. The PIR sensor detects intruder motion, prompting the Raspberry Pi to activate the camera. Images are analyzed with OpenCV for facial recognition, triggering the buzzer upon positive identification. This real-time security system, with potential remote notifications, assures homeowners of reliability. Rigorous testing, fine-tuning, and adherence to ethical and legal standards guarantee a secure and privacy-respecting solution.

COMEDKARES STUDENT REPROT

PATIENT ASSIST BOT

PROBLEM STATEMENT

Developing robots for patient care in healthcare is a multifaceted challenge. Customization for diverse environments, prioritizing safety and reliability, navigating complex regulatory landscapes, ensuring data security, and fostering empathetic human-robot interaction are key concerns. Ethical considerations, cost-effectiveness, scalability, interoperability, and public acceptance further complicate the task. Collaborative efforts from engineers, healthcare professionals, regulators, and ethicists are essential in the ongoing process of developing innovative, safe, and ethical solutions for patient care in response to the evolving needs of healthcare delivery.

TEAM MEMBERS

Ihthihsham
Prajwal D k
Teja.L

Abhaya Y
Mithesh

SOLUTION

In addressing the multifaceted challenges of healthcare robotics for patient care, innovative solutions must prioritize customization for diverse environments and patient needs. Emphasizing safety and reliability is crucial to prevent potential severe consequences of malfunctions. Overcoming regulatory hurdles requires a nuanced understanding of healthcare standards. Safeguarding data security and patient privacy is paramount, considering the sensitive information handled by healthcare robots. The solution lies in developing robots that engage empathetically and effectively with patients, ensuring a harmonious human-robot interaction in the complex healthcare landscape.

COMEDKARES STUDENT REPROT
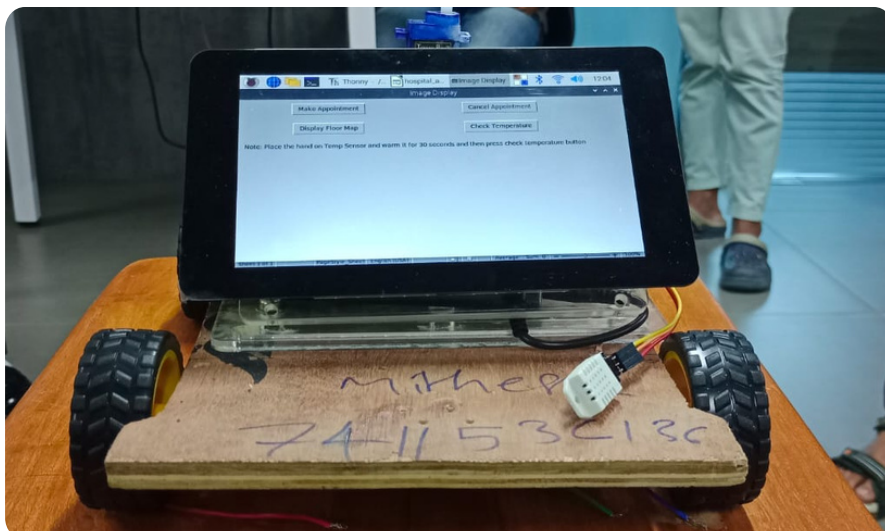
SEWER CLEANING AND INSPECTION BOT

PROBLEM STATEMENT

The persistent prevalence of manual scavenging in sewers is a pressing concern, representing a grave violation of human rights and endangering the lives of marginalized and impoverished workers. Despite legal prohibitions, individuals continue to face life-threatening conditions while manually cleaning sewage systems. This deeply ingrained issue underscores a systemic failure in addressing underlying problems. An immediate and comprehensive intervention is imperative to eradicate manual scavenging, replacing it with advanced and safer technological alternatives, thereby safeguarding the dignity and well-being of workers and upholding their fundamental rights.

TEAM MEMBERS

Suhan
Sawan
chiranthana

Shreejal
Srujal

SOLUTION

In response to the aforementioned problem statement, students have devised a solution: a prototype scavenging robot equipped with a camera and ultrasonic sensor for efficient detection. This innovative technology aims to eliminate the need for manual labor in hazardous sewer environments. Controlled by an Arduino controller, the robot offers a safer and more advanced alternative, ensuring the well-being of workers while addressing the systemic issues surrounding manual scavenging.
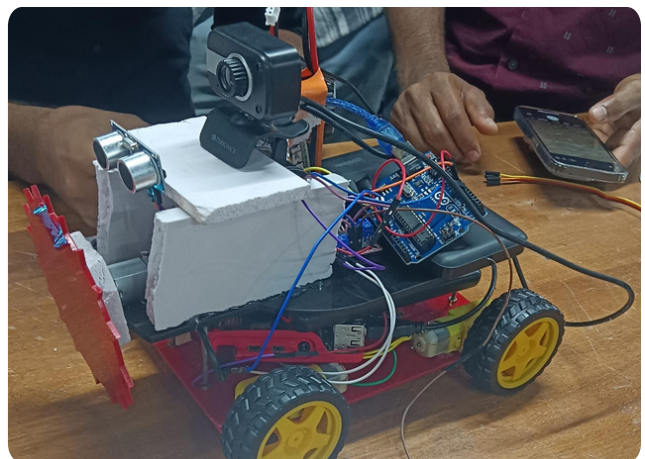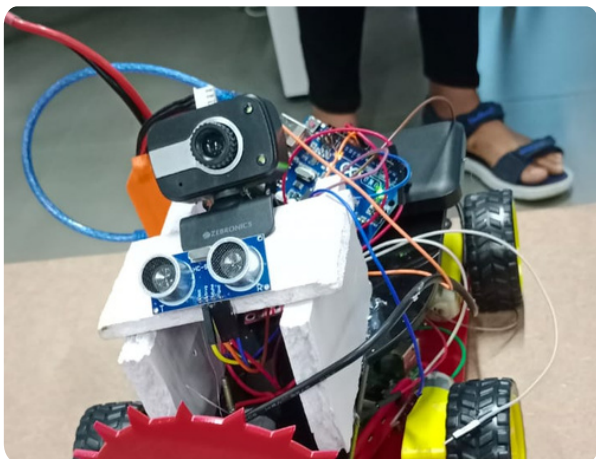
MULTI FUNCTIONAL BOREWELL RESCUE ROBOT

PROBLEM STATEMENT

The rescue of children trapped in borewells poses numerous challenges. The narrow, deep shafts make access difficult for rescue teams, hindering swift operations. Technical complexities arise due to limited space, necessitating specialized equipment. Delicate operations risk harm to the child, demanding precision. Time constraints add urgency, amplifying the pressure on rescuers. Coordination among various agencies is crucial, yet often challenging

TEAM MEMBERS

Suhan
Sawan
chiranthana

Shreejal
Srujal

SOLUTION

Introducing the 'Borewell Rescue Robot,' solution to the formidable challenge of navigating intricate borewell terrain. This prototoype of the robotic system maneuvers through complex and hazardous environments, precisely locating and retrieving individuals in distress. By enhancing the safety and efficiency of borewell rescue operations, the project stands as a crucial response to urgent concerns, aiming to save lives in critical emergencies through cutting-edge technology and strategic intervention.

UV DISINFECTION ROBOT

PROBLEM STATEMENT

The pressing concern lies in the perilous disinfection protocols within healthcare facilities, exposing frontline workers to heightened infection risks amid contagious diseases like COVID-19 and Nipah virus. Hospital staff, including nurses and doctors, assume the task of disinfecting wards, elevating their vulnerability during patient care. This dilemma highlights the formidable challenge of ensuring thorough disinfection amidst rapidly spreading diseases, jeopardizing the safety of healthcare personnel.

TEAM MEMBERS

Dhanya Kumari S   **Preethi P**
Rucheeta Metri   **Prithviraj n nambiar**

SOLUTION

The Automated Sorting System, which employs Raspberry Pi, OpenCV, DC motors, and servo motors, presents an effective answer for sorting objects based on color in industrial applications. This automated system caters to the requirements of a range of industries, including manufacturing, logistics, and recycling. By utilizing Raspberry Pi as the central controller and leveraging OpenCV for accurate color recognition, the system optimizes sorting procedures.

ACHIEVEMENTS

46 STUDENTS PARTICIPATED	**7** EVENTS PARTICIPATED	**5** EVENTS WON

Anvesana Innovation and Entrepreneurial Participation

ABOUT THE EVENT

"Automatic Wet Preventing Mechanization," secured both attention and a spot for funding and mentoring, ranking among the top 8 teams. This achievement marks a significant entrepreneurial milestone, underscoring the acknowledgment of their outstanding work.

TEAM MEMBERS | **Ujwal U Naik | Sai Prasad Nayak M | Tejas Kumar | Syed Saleha**

SIGFEST'23
Third Place

ABOUT THE EVENT

At SIGFEST'23, hosted by Manipal University–Jaipur, excelled in the ROBO SOCCER competition, clinching the 3rd place. Their remarkable performance showcased not just technical expertise but also strategic brilliance, earning them well-deserved recognition in this fiercely competitive arena.

TEAM MEMBERS | **Syed Hyder Mahdi | Abhal Nihal | Mohibin Numan**

Epicthon
First Place

ABOUT THE EVENT

Epicthon, in collaboration with INEX India and Be Practical Tech Solution witnessed B.I.T Mangalore students deliver a stellar performance. The talented team actively engaged in ROBO SOCCER, securing the coveted 1st prize.

TEAM MEMBERS **Syed Hyder Mahdi | Nararyan Nayak | Harshit Kumar**

Caterpillar Autonomy Challenge
Third Place

ABOUT THE EVENT

IIT Madras hosted the Caterpillar Autonomy Challenge where B.I.T Mangalore's Team Automation Alliances claimed victory, securing the third position and a cash prize of Rs 40,000. Having completed the Innoventure Robotic Internship from ComedKares, the team effectively applied the concepts learnt, mastering the utilization of Raspberry Pi. Furthermore, the team seized the opportunity to engage with industry experts from Caterpillar Company, enhancing their practical knowledge.

TEAM MEMBERS

Aadil Nazeera Gundagi
Syed Nabeel Hussain
Mohammed Fayeem
M H MUHAMMAD RIZWAN
Mohammed Thahseen
Mahammad Arshak P

Technoxian, World Robotics Championship Participation

ABOUT THE EVENT

The TECHNOXIAN, World Robotics Championship Series 7th edition held in Noida, a prestigious event that brought together robotics enthusiasts and experts from around the world. The team showcased their skills, innovation, and dedication to robotics.

ROBO SOCCER

Team Shastra from Canara College of Engineering demonstrated exemplary skills at the prestigious Technoxian World Robotic Championship on July 25, 2023, particularly shining in the ROBO SOCCER event.

TEAM MEMBERS **MEHUL KINI | ANOOP S PRABHU | RAHUL BHAT | SARTHAK PAI | PRATHAM | PRANAM | VAIDURA**

ROBO RACE

Students from Sahyadri College of Engineering and Management in the thrilling ROBO RELAY event. Their innovative prowess and technical acumen were on full display as they competed fiercely in this cutting–edge robotic competition.

TEAM MEMBERS   **Ananth | Vasanth**

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