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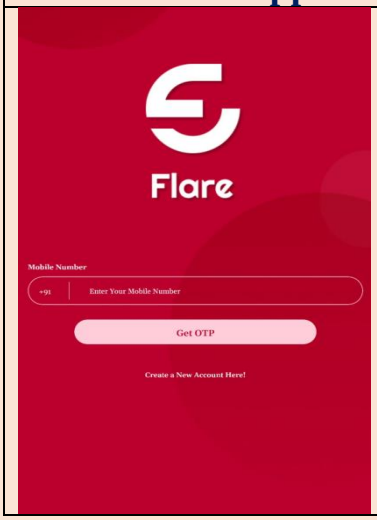
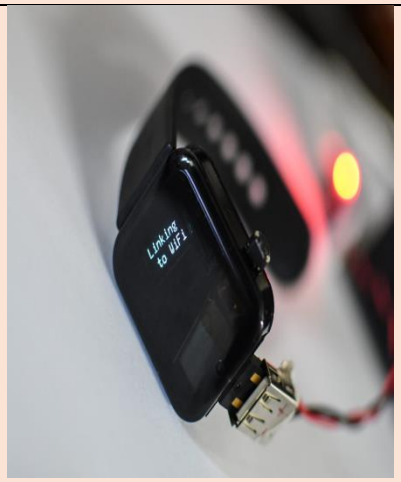
FLARE - PREVENTIVE WOMEN'S SAFETY APP USING LOCATION BASED ALERTING (DST FUNDED PROJECT)

Women safety in India is a big concern and Security for women has become a major issue as the number of crimes over women and girls is increasing day-by-day.

Mobile App	Prototype	Product
		

- **Developed an android based mobile application that will proactively enable women security while in unfamiliar places using location-based tagging (without internet facility).**
- **Track the current location of the women who can activate the mobile app directly or with a help of wrist band.**
- **A women safety device-based women tracking system.**

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SMART BELT

The PREGAID Smart Belt monitors maternal and fetal health in real-time, providing vital data access and early intervention, especially benefiting underserved populations with limited healthcare access.

- **The PREGAID Smart Belt revolutionizes maternal health monitoring with a wearable, low-radiation device that continuously tracks vital signs via IoT and shares data with healthcare providers through a mobile app. Compact and user-friendly, it supports remote monitoring and early interventions, making it invaluable for high-risk pregnancies, especially in underserved areas.**

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SMART SHOE

An Integrated Intelligent Assistive System combining smart shoes, walker, and air cushion, uses IoT and AI for real-time gait analysis, fall prevention, and remote monitoring.

- **This device integrates smart mobility aids—a smart shoe, walker, and air inflation tube—into a unified assistive system for real-time fall prevention and mobility enhancement. Utilizing IoT and AI, it enables remote monitoring and predictive care via ThingSpeak, supporting independence while allowing caregivers timely intervention.**

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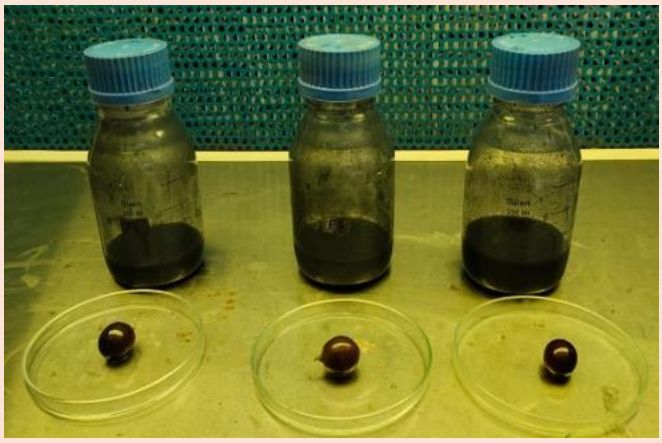
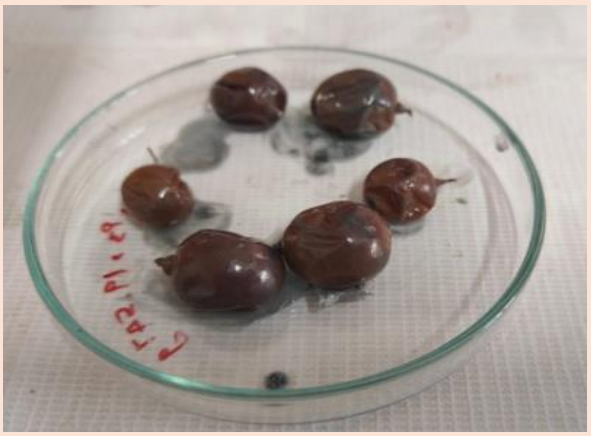
NANOCOMPOSITE FILM FOR PRESERVATION OF FRESH FRUITS

This innovative nanocomposite film offers a promising solution for the preservation of fresh fruits, providing a biodegradable, antimicrobial, and antioxidant packaging material. The integration of MoS_2-ZnO nanoparticles and Moringa extract with PBAT enhances the film's performance, making it suitable for industrial applications.





- **MoS_2 (Molybdenum Disulfide) exhibits excellent physio-chemical properties like high surface-to-volume ratio, tunable band gap, and catalytic capabilities.**
- **ZnO (Zinc Oxide) contributes with its wide band gap, high chemical stability, and exciton binding energy.**
- **The film effectively preserves fruit quality by preventing microbial contamination and oxidation, offering a biodegradable, antimicrobial, and antioxidant solution for fresh fruit packaging.**

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INTELLIGENT HELMET

This technology enhances safety while prohibiting ignition of the vehicle if the user is not wearing the helmet and if the user has consumed liquor. Thereby enforcing the user to wear the helmet and prevent liquor consumption during driving, which will utterly eradicate the drunk and drive issues throughout the country. The system also checks and controls the speed of the vehicle automatically while entering speed limit zones like Hospitals, schools, colleges, etc.

- **The system allows the user to remotely monitor the vehicle and control vehicle ignition during theft.**
- **Has the ability to sense the occurrence of an accident and immediately sends the location details of the vehicle to several emergency contacts like Ambulance, Police, friends and family who could bring help as soon as possible.**
- **The surface of the helmet incorporates a flexible solar panel which helps as an independent power source for the helmet system.**
- **It also has a mobile charger port which would help the user to charge their mobile phones while travelling.**

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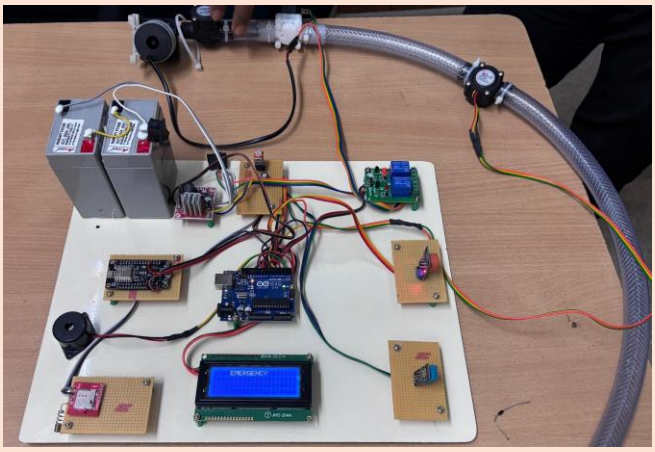
INTEGRATED GAS LEAKAGE DETECTION

This system is designed for underground gas pipelines and channels used in commercial settings, where the risks of gas leaks can pose significant hazards to both safety and operational continuity.

By leveraging various sensors, an Arduino controller, and communication technologies, this system aims to create a proactive safety solution that enhances operational reliability and ensures compliance with safety regulations.



- **To mitigate the risk of gas accumulation, the system incorporates a pump motor that activates upon detection of elevated gas levels.**

- **The solenoid sensor is also critical to the system's safety measures; it monitors the position and functionality of the solenoid valve, which automatically shuts off the gas supply when a leak is detected.**

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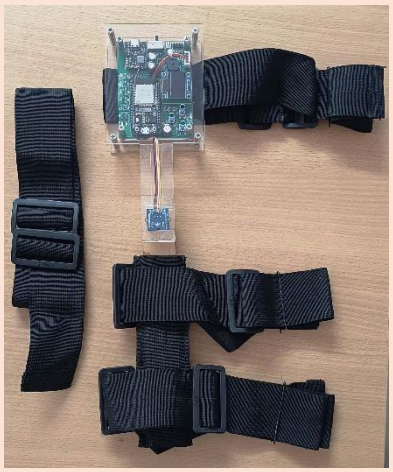
FRACTURED PATIENT REHABILITATION USING INTERNET OF THINGS

Monitor the movement of patient during postoperative treatment, after injuries like hip fracture, leg fracture, hand fracture and alert the patient, therapist or attendee upon identification of severe strain in the treatment area.

Monitor and record the effectiveness of rehabilitation exercises taken by the patient.



- **To Remote Monitoring: IoT-enabled wearable's and sensors which can track patient movements, vital signs, and progress in real-time.**
- **Rehabilitation Exercises: It guides patient through customized rehabilitation exercises, ensuring they follow the prescribed routines correctly.**
- **Telemedicine Consultations: Enables virtual consultations with healthcare providers, allowing patients to receive guidance, ask questions, and receive adjustments to their treatment plans without leaving their homes.**
- **Data Analytics: Analyzes data to identify trends and patterns in patients' recovery progress.**

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TRANSFORMING WASTE INTO CARDBOARD MATERIAL

Transforming waste into cardboard material water hyacinth, mosambi peel and sugarcane baggasse reinforced with epoxy polymer

Industries looking for cost-effective alternatives to synthetic composites could adopt these natural fiber-reinforced options, especially as raw material costs remain low due to the abundance of water hyacinth and other plant-based fillers.

- **The use of water hyacinth (WH), an invasive and abundant plant, along with agricultural byproducts like sugarcane bagasse (SB) and Mosambi peel, provides a cost-effective raw material source.**
- **The use of natural fibers and powder reduces energy consumption compared to synthetic composites, contributing to both cost-effectiveness and environmental sustainability.**
- **This aligns with trends toward using sustainable materials in interior design and construction.**

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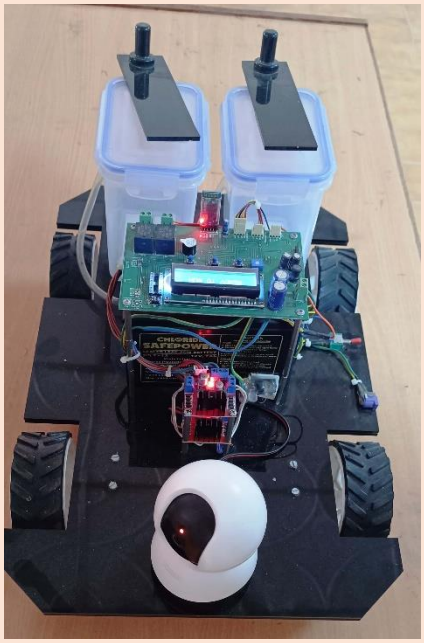
PRECISION INTEGRATED AGRICULTURE USING BIG DATA

Machine Vision System to alert user on identification of infestation of pest, plant diseases or weed.

The system provides appropriate nutrients like Nitrogen, Phosphorus, Potassium, Pesticides to soil and plant and predicts maturity of crops.



- **Controls irrigation based on sensor data like temperature, moisture, light and humidity.**
- **The system uses drone/robotic techniques to spray herbicides/pesticides only on the weed, thereby avoiding wastage of chemicals and contamination of ecosystem.**
- **Perform early detection and control of pest infestation.**
- **Detect plant diseases and weeds.**
- **Automate irrigation system.**

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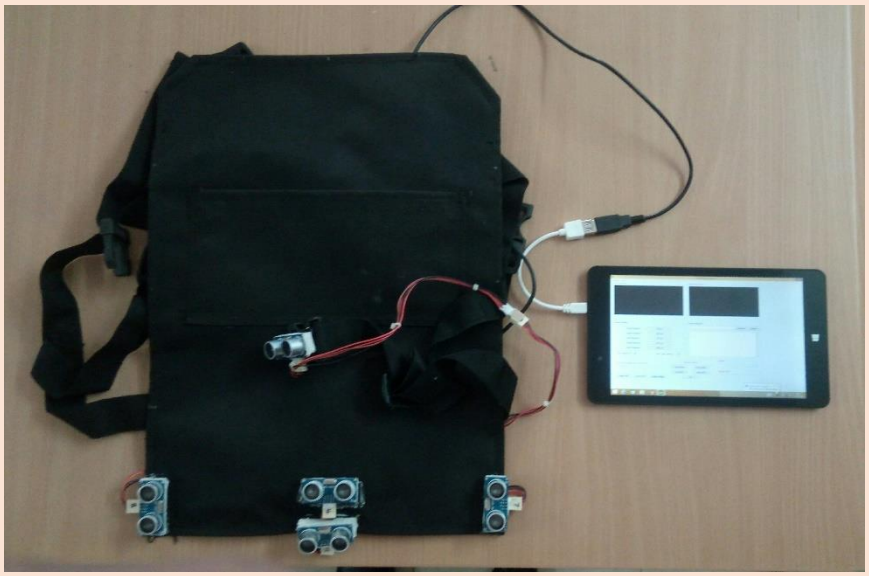
SMART VISION SYSTEM FOR VISUALLY IMPAIRED

This product is designed to assist visually impaired people via an application that is compatible with windows operating system. A wearable jacket incorporated with ultrasonic sensors connected in five directions namely front, left, right, back, front lower, is used for them to walk through voice guidance.



- **The system indicates the obstacles based on which the user will move forward and it also recognizes the printed text and conveys the information through voice, therefore carrying special devices like walking cane for guidance can be avoided.**
- **With the help of GPS, the system acts as an offline navigation device to provide navigation instructions to the user.**

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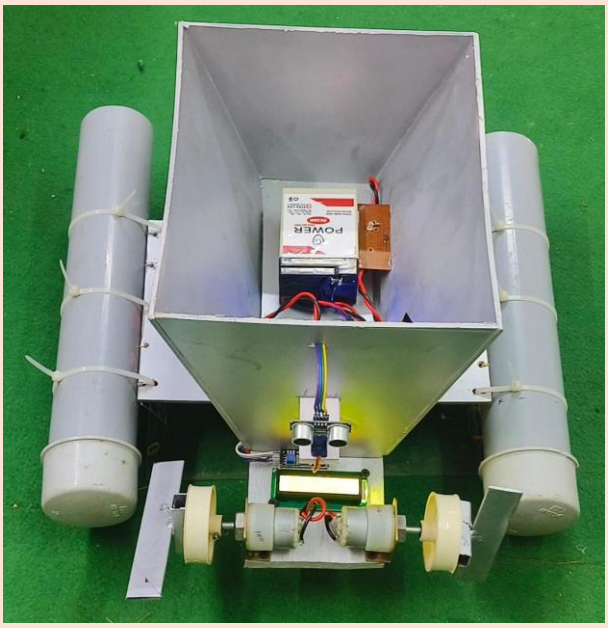
RIVER CLEANING AND WATER QUALITY

The machine lifts the waste surface debris from the water bodies, this will ultimately result in reduction of water pollution and lastly the aquatic animal's death to these problems will be reduced.



- **Automated cleaning mechanism could increase the efficiency with minimal expenses. Since the boat has PVC pipes under it, the air tube piping guider mechanism draws all floating garbage from water towards boat.**
- **Ultrasonic sensor measures the distance of a target object by emitting ultrasonic sound waves, and converts the reflected sound into an electrical signal.**
- **Cleaning of certain amount of waste with the conventional method that took 20 min is performed using the river boat in 11min.**
- **Stores energy in the battery and uses it for river cleaning with the help of a motor and chain drive arrangement.**
- **With the help of GPS, the system acts as an offline navigation device to provide navigation instructions to the user.**

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TONGUE RETRACTOR

This invention is about a tongue retractor and a method of retracting the tongue from interference between the upper and lower teeth during occlusal assessment performed under General Anaesthesia before final fixation of the bone plates in jaws, crown placements and during Orthognathic Surgeries using this Tongue Retractor.

- **The tongue retractor is used for retracting the tongue and to attain the accuracy of the occlusion on the inner side during dental treatment.**
- **The single piece stainless steel tongue retractor flexible plate is made in four sizes as small, medium, large and extra-large according to the age of the child or person.**
- **A cheek retractor can be also incorporated along with the tongue retractor during general anesthesia thereby reducing man-power in the operation theatre for retraction of**
- **The apparatus helps in ascertaining centric occlusion or physiologic occlusion before final cementation of crown and bone plating in maxillofacial fracture and orthognathic surgical cases.**

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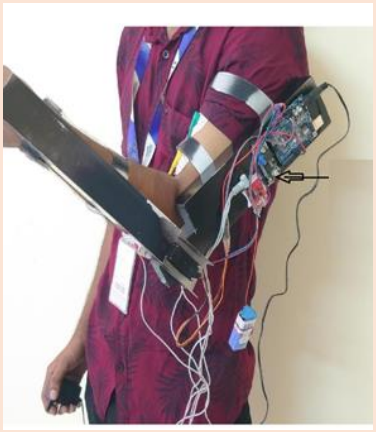
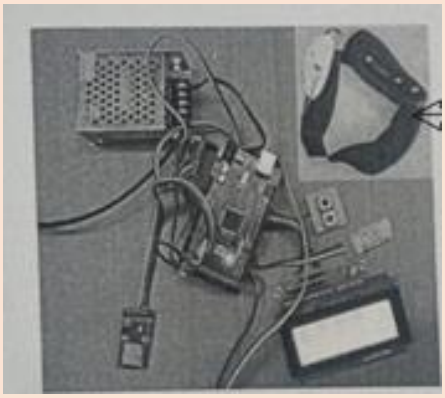
ARTIFICIAL INTELLIGENCE BASED EXOSKELETON FOR PARALYTIC PATIENTS

In India, thousands of paralytic patients are bedridden due to paralysis of their limbs. It is very difficult for their family members to look after them as they depend on others for their daily routines. To improve the lives of paralytic patients, an artificial intelligence-based exoskeleton is being developed. This technology aims to enhance mobility and independence, helping patients regain some control over their physical movements and reduce the strain on caregivers.





- Artificial Intelligent based exoskeleton for paralytic patients, which will help them to use their limbs to carry out their daily routines.
- It is connected with sensors to prevent the paralytic patient wearing the exoskeleton from falling down.
- It is also takes signals from the brain of the paralytic patient to enhance their limb movements, It is an brain controlled device.
- It can collect health data of the paralytic patient and communicate with the doctor.

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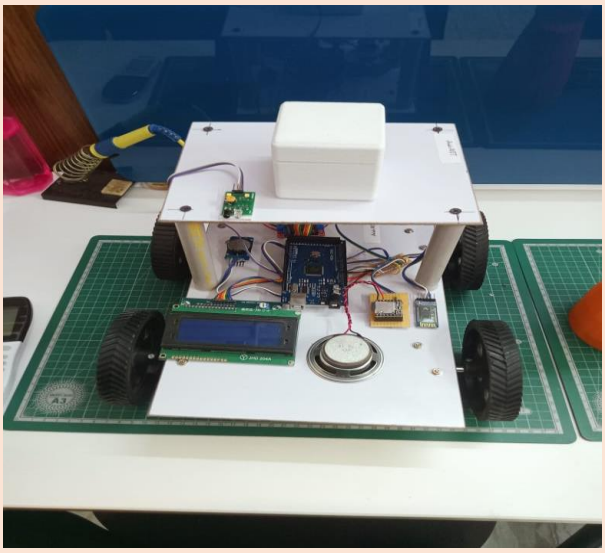
AUTOMATIC DRUG DISPENSER ROBOT

The Automatic Drug Dispenser Robot is an innovative healthcare technology designed to improve medication management for individuals with complex medication regimens. The existing system typically relies on manual processes, where patients are responsible for self-administering their medications.



- The Automatic Drug Dispenser Robot is a sophisticated and user-friendly system designed to revolutionize medication management.
- This system leverages the capabilities of modern technology, including an Arduino Mega microcontroller, Bluetooth control, Real-Time Clock (RTC), servomotors, 3D printing, an IR sensor, and audio reminders, to create an advanced and automated medication dispensing solution.
- This represents a significant advancement in medication management, promoting medication adherence and enhancing the quality of healthcare for patients with complex medication regimens.