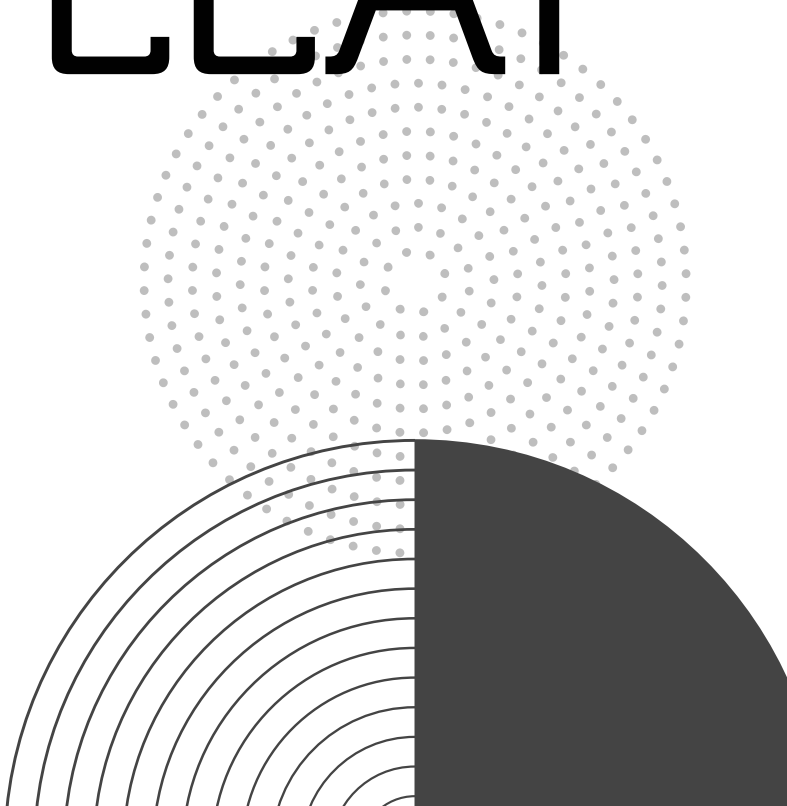
tech chronicles

2021-22

THE NEXT BIG LEAP



POWERED BY

MVJ COLLEGE OF ENGINEERING
Since 1982

Engineering A Better Tomorrow

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> Education is the most powerful weapon which you can use to change the world.

MESSAGE FROM CHAIRMAN

TThe engineering education in many engineering institutions across the country does not get the focused attention to the practical training aspects for the students, which is very essential for a successful career in the industry. I am indeed privileged to chair the Governing Council (GC) of MVJ College of Engineering (MVJCE) for the last three and half years. The Governing Council has very eminent professionals as members drawn from the prominent industry, academia and R&D Institutions including IISc, ISRO and DRDO. Considering the essentiality of imparting practical skills without affecting their academic and research activities, GC initiated a number of programmes in a progressive manner over a period.

The activities introduced are the **Idea Box**, to encourage the students to generate innovative ideas, **Tomorrow's Engineers Club**, to train them in problem solving skills, **Foundation Skills in Integrated Product Development (FSIPD)**, a base training for teaching product development skills, **Entrepreneurship Development Cell**, to inculcate and encourage the entrepreneurship culture among students and **Tinkering Laboratory**, which provides opportunities for students to transform their innovative ideas into useful proto units.

While defining the projects, special focus is given particularly to the societal / industrial problems. The tinkering lab is kept open for extended hours beyond regular timings. With such a strong foundation, students confidently participate in several city-level, state-level and national-level competitions and win prizes. These successes are being reported increasingly in the prominent press and media. These efforts have brought a paradigm shift in their outlook towards practical aspects and triggering their imagination.

This book is brought out mainly to provide a glimpse of the various innovative projects carried out by the bright students of MVJCE. I earnestly hope that this book not only would act as a catalyst to motivate other young minds to innovate and undertake such projects, but also in enhancing the awareness of the efforts of MVJCE, particularly in readying the students for industry, amongst parents, students and also the general public.

Dr. BN Suresh

Chancellor, Indian Institute of Space Science and Technology, Trivandrum

Hon Distinguished Professor, ISRO HQ, Bangalore

(Past President, Indian National Academy of Engineering, Delhi,)

(Former Director, Vikram Sarabhai Space Centre, VSSC, Trivandrum)

(Founder Director, Indian Institute of Space Science and Technology, IIST)

(Former Member, Space Commission)

CENTRES OF EXCELLENCE

National instruments (NI) LabVIEW Academy

An MVJCE Centre of Excellence in collaboration with National Instruments

This lab trains and certifies students on LabVIEW platform, which is used to develop projects and conduct research-analysis in collaboration with faculty.

Triumphs

- MVJCE was awarded LabVIEW Academy Award by National Instruments of India
- Five students and five faculty members cleared CLAD examination and received certification by NI
- Certified faculty conducted eight FDPs in collaboration with NI Academy members
- Six batches of students completed training in Graphical Programming on LabVIEW
- NI certification has helped students bag lucrative job offers in top companies, including NI, and inspired a few others to start their entrepreneurial journey

Robotics and Industrial Automation Lab

Established in 2015, this Centre of Excellence conducts hands-on training and workshops in robotics and automation, which are conducted in stages.

L1: Introduction to Robotics using AVR micro-controller family module

L2: Innovation and Creative training in Robotics based on Arudino

L3: Advanced training module

L4: Project oriented training module guided by Robolab trainers

Triumphs

- M300 students have been trained so far
- Students regularly participate in various competitions conducted by premier institutions. So far, they've won over 40 competitions
- Students have developed premier technologies that have social impact A gesture–based vocaliser to help the hearing impaired is one of them. This innovation was featured in prominent dailies and the team also awarded Rs 1 Lakh prize by IISc

COLLABORATIONS

MVJCE-IIT-B

Spoken Tutorial Project, an initiative from IIT-Bombay, supported by NMEICT, MHRD, Government of India, provides online tutorials for students to learn new technologies. MVJCE functions as a Resource Centre for promoting the project.

In 2012, the college started conducting workshops and Faculty Development Programmes (FDP). The objective of the project is to provide tutorials for the technologies used in almost every domain. It provides opportunities for students to learn and get certified by IIT-Bombay.

Triumphs

- All programmes offered through Spoken Tutorial Project are free of cost
- Technologies include Latex, Linux, C/CPP, Perl, Java, Netbeans and Python
- Over 7000 students have been trained since the project's inception in 2012
- 1455 Students from various departments received certification from IIT-B in 2018-19

Campus Connect

An MVJCE Centre of Excellence in partnership with Infosys

Campus Connect stems from Infosys's Foundation Program (FP), in turn drawn from their Intellectual Property and experience in training thousands of entry-level engineers from different backgrounds and disciplines to ready them for a global workplace. The courseware provides a unique set of teaching aids with consolidated training material for the college faculty and covers essential IT topics like OOP using Java, RDBMS, Software engineering, UI and Web technology.

Triumphs

- 1250 students have been trained on-campus
- MVJCE has received 15 silver and 11 Bronze certifications
- The college received an Outstanding Performance Award for rolling out Foundation Programme in 2015 and 2017
- Currently Advanced level partners with Infosys
- MVJCE has successfully completed the sponsorship project offered by Infosys

SPECIAL CELLS

IIPC Cell

MVJCE's thriving Industry–Academia collaboration facilitates opportunities for internship, field visits, campus placements and innovative projects. Our students in the past have successfully completed projects with HAL, NAL, DRDO, ISRO, etc.

Triumphs

- Three students (ECE department) successfully completed Employment Enhancement Training Program conducted by BSNL in association with AICTE. They are now certified as BSNL Silver Certified Engineer, BSNL Gold Certified Engineer and BSNL Platinum Certified Engineer
- IIPC Cell organised Industry Institute Partnership Workshop on "Skill Development in Engineering Sector" in bringing nine experts together and to benefit 450 plus students
- Events conducted by IIPC cell have facilitated a partnership with the Consortium of Electronics Industries Karnataka (CLIK) offering internships and other collaborations with SMEs for students

Entrepreneur Development Cell (EDC)

Inaugurated in 2015, Entrepreneur Development Cell focuses on developing and encouraging students to imagine solutions that have societal impact, business impact, sustainable impact and also those that can be implemented in the college campus to solve challenges. Each year, EDC shortlists 14 final year projects and nominates them for Gandhian Young Technological Innovation (GYTI) National Awards.
Students who come to the Cell with ideas are given an opportunity to present their case, and the shortlisted ideas are converted into projects or products. Many projects receive initial funding from the college management, and are showcased to industry doyens during the college's Innovation Day. EDC also organises regular seminars, guest talks, workshops and training programmes to support the innovative streak of our students and faculty members.

Triumphs

The pride of EDC is the type of projects it serves as an incubation platform for. Students and staff collaborate and work on solutions that have a large-scale impact. Some of these are

- "Timer Based Irrigation System with Nutrient Detection of Soil", an app that helps farmers irrigate their fields during uncertain power outages.
- "STABLE - Steps Towards Better Life", an app that offers help support and succour to strangers (students & job aspirants) who are new to Bangalore.
- "Waste Management Alert And Tracking System", an efficient and fool proof system to manage and collect garbage

These achievements were covered by all leading newspapers

SPECIAL CLUBS

Tomorrow's Engineers Club

Tomorrow's Engineers Club, set up in 2016, provides opportunities for students to interact with peers from various domains and develop team spirit, leadership and practical skills. Club strives to inculcate the features of an ideal engineer into every student who's a part of the Club. These features include out-of-box thinking and the ability to apply engineering principles to solve open-ended problems that have societal impact. The club regularly conducts workshops and seminars to fulfill its vision.

Triumphs

- 58 societal projects implemented since inception
- 350 students trained through 7 prominent workshops

Astronomy Club

Astronomy club, established in 2015, draws students interested in the faraway non-terrestrial world. Students visit the planetarium, and observatory to observe celestial events. Students are also trained to develop technologies that can take space exploration to the next level.

Triumphs

MVJCE students are currently developing radio telescope to detect radio-frequency radiation emitted by extraterrestrial sources.

Software Development Club

MVJCE's Software Development Club, inaugurated in 2016, encourages students and faculty to embrace the digital world and improve their coding skills by taking up projects and developing Android applications. Many projects developed in this club are being implemented by the college to ease operational challenges. The club also conducts seminars, trainings and workshops with an objective to train students on different design tools, scripting languages and programming languages that'll help them in their application development pursuit.

Seminars include an insight into Microsoft Student Partner (MSP) programme and Microsoft Office Specialists Certification programme to create awareness on Microsoft Office Specialists (MOS) certification and how to become an MSP. Training sessions on PHP, Python, Photoshop, VB.net are conducted regularly.

Triumphs

- Students developed an app to send notifications of upcoming events to the entire campus
- A team developed an app through which students can place a request for library books online and the librarian can respond in real-time
- Students developed a bluetooth-based attendance tracking system
- Four students participated in TCS Code Vita competition and secured noteworthy ranks among 1 lakh participants

SPECIAL LABS

Tinkering Lab

MVJCE students find avenues for innovation and discover the joy of creation through the Tinkering Lab, a dedicated space on the college campus, where students come to explore ideas, develop the technology from ideation to prototyping. The Lab provides basic machinery, materials, tools and instruments for crafting their imagination. Students across all departments of the college access the lab at their convenience.

Triumphs

- 40 multi-disciplinary projects were completed by students from various branches

- Students developed a low-cost biotic solution to clean up dirty and smelly Bangalore lakes and provide some much-needed fresh air

UAV Lab

One of the critical areas of research by Indian Government and many scientific agencies is Unmanned Aerial Vehicle for the purpose of national security. MVJCE's UAV club engages students in this critical area and enables them to pursue the design and fabrication of Unmanned Aerial Vehicles. It encompasses the application of aerodynamics and stability in real aircraft models and helps students get a hands-on experience in Aeronautical Engineering. UAV Lab conducts workshops in areas of aircraft fabrication, aero-modelling etc.

Students have developed models of Quad copters, Hex copters, and fixed wing aircrafts. They have even developed a medical drone that delivers critical medicines to patients even during peak traffic hours.

Triumphs

- Students received gold and bronze medals in the NDRF National Student Design Competition

- Team Abhimanyu has won first and second places in the prestigious National Aerospace Conceptual Design Competition (NACDeC) (2017-18, 2018-19)

- Mr. Omkar Shriram Lawate (USN: 1MJ15AE057) from Aeronautical Engineering Department won Gold Medal in 49th All India Student Design Competition for bringing out a newer conceptual design on Adaptive Slotted Winglets using Shape Memory Alloys based actuators for better aerodynamic performance at various stages of flight of transport aircraft and UAVs. from Aeronautical Engineering Department won Gold Medal in 49th All India Student Design Competition for bringing out a newer conceptual design on Adaptive Slotted Winglets using Shape Memory Alloys based actuators for better aerodynamic performance at various stages of flight of transport aircraft and UAVs.

RESEARCH AND DEVELOPMENT

MVJCE's Research Cell is shaped by many great minds from ISRO, DRDO, and GTRE etc., and they mentor students and faculties on specific academic interests. Since their inception, students have submitted research proposals to Government agencies and secured funding to carry out projects.

For more details please refer Appendix.

Triumphs

- On-campus Research Centres set up by Departments of Mechanical, Computer Science, Electronics & Communication, Physics and Chemistry are VTU approved

- Research Centres facilitate academic research and Doctoral programme research

- MVJCE was also chosen as a centre by ISRO for IRNSS receiver evaluation

- Over 30 Grant-in-Aid projects have been completed in the last few years

- Some of the works of students and faculty hold provisional patents

PROJECTS

01 PROJECT

BIO-METHANE PRODUCTION BY ANAEROBIC DIGESTION OF FOOD WASTE AND FLOWER WASTE

Kishor Pradeep
CV

Divya N
CV

Aishwarya
CV

Abhishek
CV

Consumers of food are the leading producers of food waste.
Food waste gets embedded in the general waste where it is incinerated or sent to a landfill. Hence, it should be managed in a sustainable way to avoid depletion of natural resources, minimize risk to human health, reduce environmental burdens and maintain an overall balance in the ecosystem.

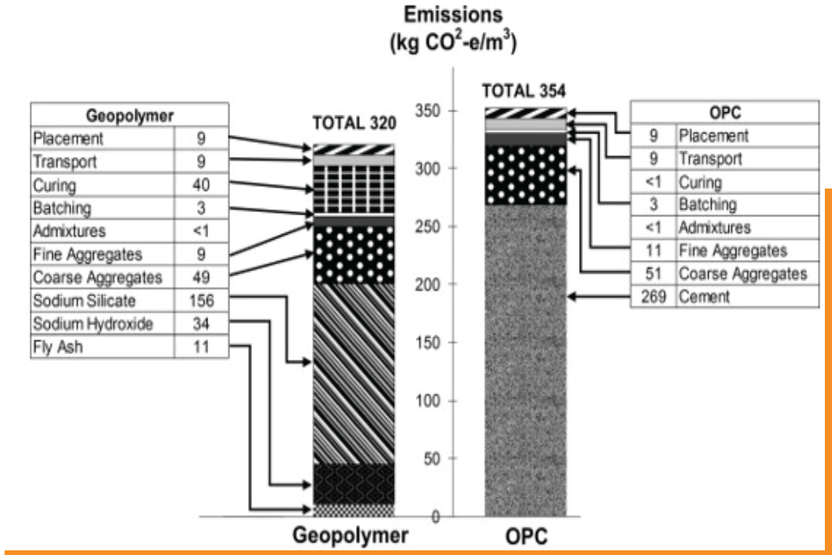
The main focus of this study is to evaluate and optimize the methane potential of food waste. A huge amount of flower waste is generated in temples, markets, etc. Flower waste contains a good deal of nutrient and lignocelluloses material which can be used for a variety of purposes like producing bio-energy and bio-fuel to achieve sustainable energy demands. Low-cost bio-energy can be generated from flower waste. Energy from flower waste may be utilized in the form of biogas, bio-hydrogen, bio-ethanol, bio-charcoal, or by direct burning to get heat energy.

Anaerobic digestion (AD) is a microbial process for production of biogas, which consists primarily of methane and carbon dioxide. AD is a promising technology which could effectively address the problem of food waste disposal, yielding valuable outputs like biogas and fertilizers.
There are many different options that can be applied to the management and evaluation of waste treatment, and anaerobic digestion seems to be one of the most suitable solutions because of its benefits, including renewable energy generation in the form of biogas. This study focused on biogas generation with the help of Anaerobic Digestion by blending the food waste and flower waste through suitable environment for maximum yield of gas production with minimum environment impacts.

In this Project, a trail was made to analyze the feasibility of the replacement of OPC in conventional concrete with Metakaolin-based Geopolymer, by addressing the workability issues with its complete replacement.

The analysis is based on the variation of the strength and workability, by taking a fixed ratio of coarse aggregate, fine aggregate, metakaolin, activator (Sodium hydroxide and sodium silicate), and changing the percentage of superplasticizer in the mix from the baseline (0%),with increments of 1%, and performing compressive strength test to determine the 1st day and 28th day strength, as well as determining the effect of ambient curing of Geopolymer concrete on its compressive strength and comparing it with previous studies where infrared or high temperature curing methods have been used.

Features:
· Finding an alternative for the complete replacement of OPC
· Enhancing the workability of Geo-polymer concrete
· Improving the strength aspects of concrete



02 PROJECT

EFFECT OF SUPERPLASTICIZER ON METAKAOLIN -BASED GEOPOLYMER CONCRETE

Gowrishree
CV

Taha Iqbal Khan
CV

Tridhar
CV

Vikas B
CV

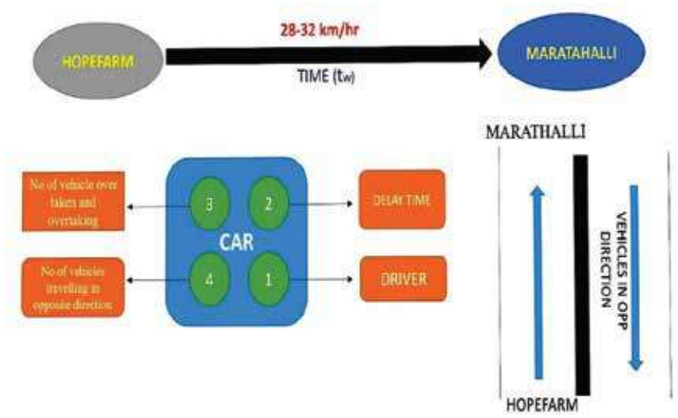
03
PROJECT
ANALYSIS OF CONGESTION PRICING IN URBAN AREA

Sai VIjayanand
CV

Sachin Kumar M
CV

Reddy Aravind C
CV

Pavan K S
CV



Traffic congestion has been one of the major issues that most metropolises are facing, in spite of measures being taken to mitigate or reduce it. In the recent past, traffic congestion has emerged as one of the main challenges for engineers, planners and policy makers in urban areas. Modern social and economic structures, shaped by car-oriented urban development and rapid growth in vehicle ownership, have established congestion as an inescapable reality of urban life. The growing impact of congestion is seen in the deteriorating urban air quality, besides other adverse effects on the quality of urban living.

This study is aimed at understanding the persistent urban congestion, its measurement and mitigation. Literature review on this problem reveals some interesting insights. One of the important outcomes was that there is no single, broadly accepted definition of traffic congestion. Traffic congestion can generally be defined as excess demand for road travel. Many professionals and organizations have defined congestion in different ways, based on a variety of criteria. There have been attempts to develop congestion measurement indices, by heavily motorized countries. In less motorized countries, there are not many documented studies on how to measure congestion and plan for its mitigation. Identification of traffic congestion threshold is an essential requirement for defining congestion and suggesting appropriate mitigation measures.

Electronic waste (E-waste) is emerging as a unique waste stream which has drawn a lot of attention globally, and also in the Indian context, in recent times. This is a waste stream sector that is growing exponentially. This huge growth of E-waste is being managed in an informal way in developing countries, and even developed countries are facing trouble in managing this huge volume of E-waste that is being generated. E-waste contains various heavy metals and precious metals (electronic spare parts) and when they are discarded into water, air or soil, it eventually affects the livelihood and our environment.

The newer technologies can help in recovering the precious and rare earth metals which have a good value, and with this, there can be a drastic change in sustainability in the waste management sector, and can also help in providing economic and social benefits. Our project focuses on the extraction process of the precious metal (gold) from the PCBs of old mobile phones using aqua regia (HCl+HNO3), and the experiment regarding this will be carried out, considering the necessity of recycling and E-waste management in the near future.

Features:

· Minimizing E-waste generation in urban areas
· Reducing Leachate effect, thereby eliminating groundwater pollution
· Reducing the incineration process, and thus saving cost and energy

04
PROJECT
RECOVERY OF GOLD METAL FROM PRINTED CIRCUIT BOARDS OF OLD MOBILE PHONES

Akshaya G
CV

Chandana M C
CV

B Kamala
CV

Deepthi K V
CV

05

PROJECT

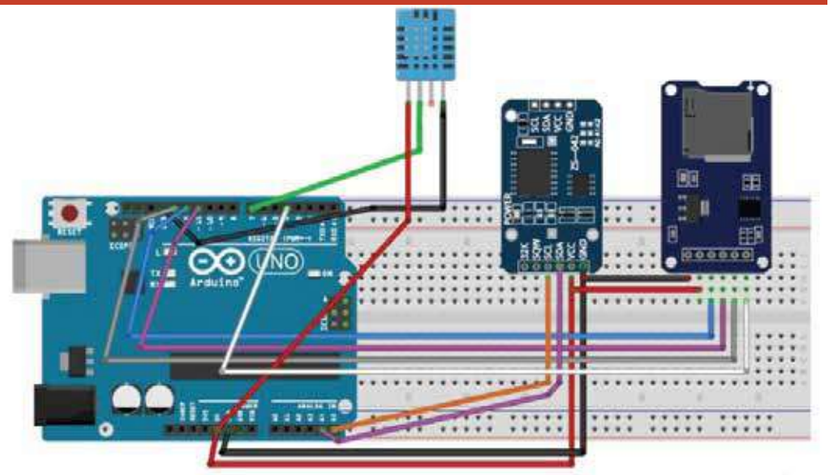
THERMAL INSULATION OF BUILDING WALLS USING NEOPRENE FOAM SHEET

P Vijay
CV

Diya K
CV

Manasa S
CV

Naveen Kumar C L
CV



Buildings are large consumers of energy, in every country. Heating and cooling loads hold a substantial share of this, and this can be reduced by various means - one of which is thermal insulation of the building. The demand for energy efficient buildings has been rising sharply. There are various materials that can be used as thermal insulating materials. In our study, we have opted for neoprene foam sheet as a thermal insulating material.

Neoprene is known for its chemical stability and thermal insulating properties. Other properties that are very important are that it is chemical resistant, waterproof and durable. Considering these properties, the experiment with neoprene foam sheet as a thermal insulating material for the concrete unit is conducted. Using temperature data logger, the temperature within the concrete unit is measured, which determines the amount of insulation provided.

Features:

· Finding an alternative for EPS and XPS foam sheet

· Using neoprene foam sheet which has excellent thermal insulating properties

· Estimating cost, using different thermal insulating foamed sheets

· Reducing the burden on ACs, and maintaining the temperature within the building walls

The coronavirus has caused havoc in the world, with the pandemic COVID-19. Hence, we selected CAMISA, with the foremost objective of a covid-positive patient being able to self-monitor, as this helps in cost reduction and also prevents the spread of the pestilence. Camisa helps in balancing the knowledge between the hardware and neural network. The clinical parameters like temperature, heart rate, breathing pattern, SpO2 obtained from the sensors used in shirt and mask are fed to the artificial neural network model, where it determines whether the patient is suffering from the virus or not. If yes, the health caregiver should be informed, so that treatment and monitoring is done. In addition to the above-mentioned, a predictive AI Model is designed for the same, as ANN helps in decision-making, to check whether a patient is suffering from COVID or not, based on the symptoms he is experiencing

Features:

- The proposed system consists of a shirt and a mask.
- The Shirt comprises of a temperature sensor DS18B20. The MAX30100 pulse oximeter sensor will retrieve the pulse beat data along with the SpO2 level, i.e the oxygen saturation level. The NTC Thermistor sensor will retrieve the temperature data.
- Then this data will be sent to the Arduino Lilypad from where the entire data will be sent to the app, using NodeMCU.
- Now with respect to the mask, the STM32 microcontroller calculates the breathing rate with a thermistor and is fixed with a few driver circuits inside the mask, and the information is sent to the software application.
- The parameters from both shirt and mask are combined, and transferred via the internet, and if the patient is facing any difficulty in breathing, he can get immediate help or be rushed to a hospital, the location of which is visible on the user-friendly application

06

PROJECT

CAMISA: An AI Solution for COVID-19

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ECE

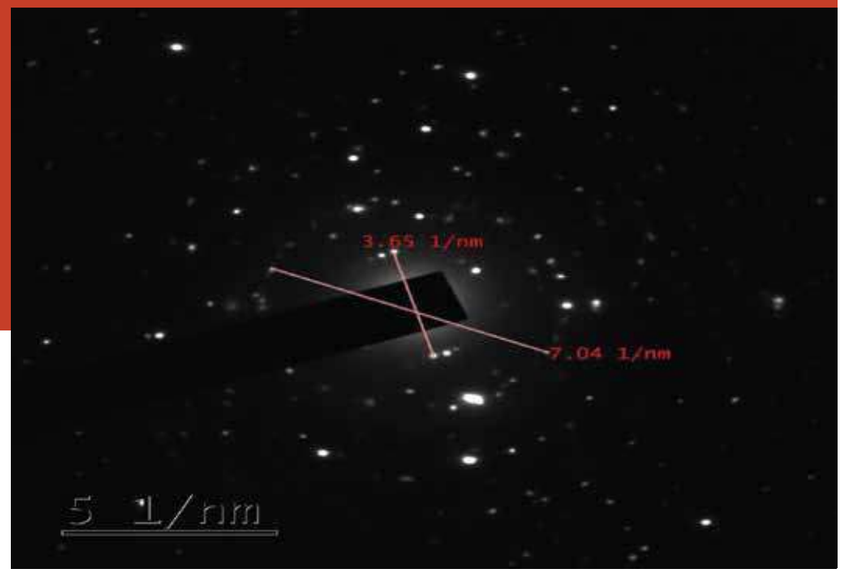
07
PROJECT

COBALT NANOPARTICLE BASED CARBON ELECTRODE

Aastha Pushpalak
CH

Preetha Chinnadurai
CH

R. Prathibha
CH



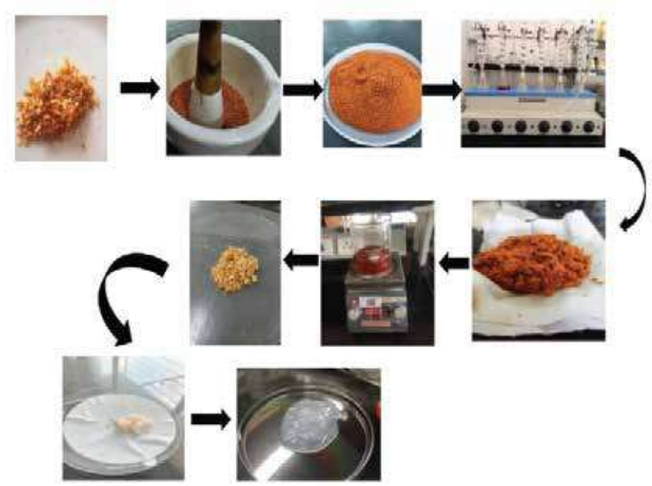
This project is about the development of non-enzymatic carbon-based electrode, for detection and quantification of nitrite. Green synthesis method is used for synthesis of Cobalt oxide nanoparticles. Sugarcane juice acts as the green solvent (capping agent). Cobalt oxide nanoparticle is used with Graphite powder (as carbon source) to prepare the modified electrode.

Nanoparticles are characterized using XRD, SEM with EDAX, FTIR, TEM with SAED to study the morphological and chemical properties. Electrocatalytic activities of developed electrode were studied using cyclic voltammetry on Electrochemical Workstation (CH-Instrument). The linear dynamic range (LDR) is 0.5 – 1000 μM, and limit of detection (LOD) is 0.3 μM

Features:
- Use of green synthesis method to prepare Cobalt oxide nanoparticles, with sugarcane juice as green solvent and reducing agent.
- A simple process with relatively less chemicals usage; easy to fabricate and cost-effective.
- Detection efficiency on-par with conventional methods.
- There is rapid detection results for nitrite in soil sample, and can be used for on-site analysis.

Due to rapid population explosion and various human activities, the scarcity of fresh water has become the main concern for the world. Due to increasing industrialization and urbanization, harmful and hazardous material enters the water bodies, endangering human health. Hence, it is absolutely necessary to remove the various organic, inorganic and biological pollutants that are present in water bodies. A number of researches are going on to find out a radical and inexpensive method to treat water. Available waste water treatment techniques such as membrane filtration, adsorption, flocculation, coagulation, catalytic degradation are inefficient in remediating the toxic pollutants from water. The conventional materials used in waste water treatment are activated carbon and petroleum-based polymer which releases a large amount of carbon, in the production process. It is totally against the creation of a sustainable environment. Therefore, it is necessary to employ a low cost, environment friendly alternative which will have excellent efficiency, along with a low carbon footprint.

In our present study, nanocrystal has been synthesized from tomato peel, by following dewaxing, alkaline process, bleaching process and hydrolysis processes. Characterization of prepared nano crystal cellulose was carried out using FTIR, BET, TEM, SEM, and XRD Analysis. We explored the adsorption capacity and selectivity of prepared cellulose nano crystal for the removal of heavy metal from waste water.



08
PROJECT

SYNTHESIS OF NANOCRYSTAL CELLULOSE

Vanishree
CH

Vinay
CH

Vanusha
CH

09
PROJECT
SOAP MANUFACTURING FROM RICE HUSK

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CH

Sinchana R
CH

U. Nihal Ahamed
CH

Globally, on an average, every year 600 million tons of paddy husk and 120 million tons of rice husk are produced. Industries use this husk in fuel and power generation. Disposal of the ash from industries will cause environmental pollution and pose health hazards. Rather than disposing the produced ash, it is used in many fields like cement, concrete, ceramics, manufacture of soap and detergent etc.

Generally, sodium silicate is extracted from sand - it is a non-renewable form of energy resource and causes itching and irritation of the skin and eye when it is used in soaps and detergents. Using eco-friendly and economical sodium silicate is our aim. Therefore, rice husk ash (RHA) is treated with aqueous sodium hydroxide which results in the formation of sodium silicate. On acidification, the sodium silicate that is formed is precipitated as silicate, which is added to laundry soap bars and detergents as surfactant. It makes the soap last longer and prevents it from rapid drying. It also acts as a foam producing agent, both in soft and hard water. Our work will explore the possible way to manufacture ecofriendly and cost-effective soap.

10
PROJECT
DESIGN AND DEVELOPMENT OF HEAD MOTION CONTROLLED WHEELCHAIR

Madhusudan M K
EEE

Ajay
EEE

Prajwal T
EEE

Ayyappa
EEE

The aim of the project is to design a 'Wheelchair Tilt Communicator' system that can operate the wheelchair of a differently abled person, with the tilting movements of his/her head. This system can be of great use to physically challenged people who cannot move their hands or legs, but who can make head and eye motions. This wheelchair can be operated in any direction, using head tilting movements.

The Design and Development of this head motion-controlled wheelchair has been achieved using tilt sensors and wireless modules. The head motion-controlled wheelchair designed using tilt communicator system will turn out to be of great use for quadriplegic patients and people having more than 45% or more disability, as this can be operated easily through head gestures. The wheel chair can be produced in a cost-effective way. It is intended to be used as a human-friendly interface for the elderly and physically challenged, to operate the wheelchair using their head motions, rather than their hands.

Features:
- Wheelchair control using head motion
- Easy interface with the help of tilt sensors
- The wheelchair is designed at a low price and a high degree of functionality

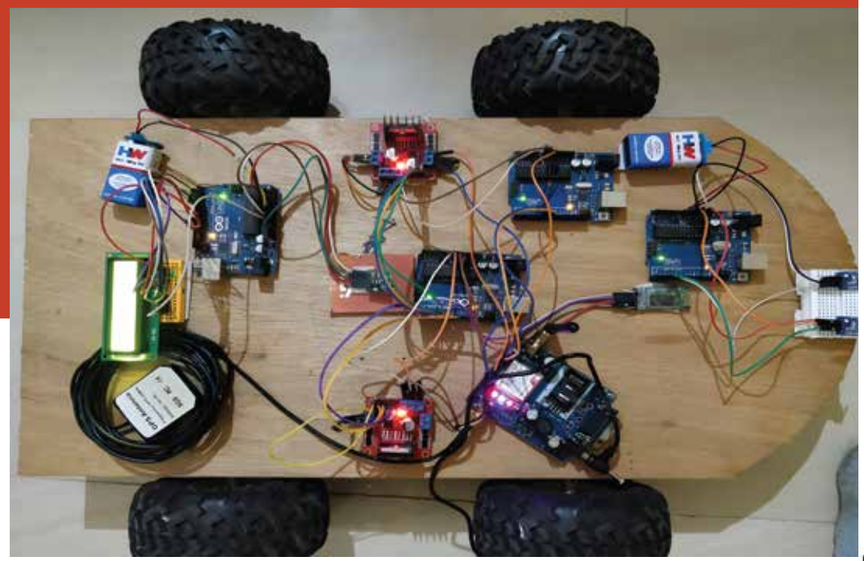
11
PROJECT
SMART VEHICLE ACCIDENT DETECTION SYSTEM

A Sunil Kumar
EEE

Amith N
EEE

Jagadeeshan A
EEE

Vijeth Bhat
EEE



We often travel from one place to another, for various reasons. One of the important modes of travel is via road. Nowadays, cars are no longer a means of luxury but rather a 'need' for transportation. Day in and day out, for commuting even short distances, we tend to use our cars. As the number of vehicles has increased, the number of accidents too has increased. Moreover, a new generation of cars have emerged which are meant to reduce accidents. However, despite the implementation of innovative ideas to reduce accidents in modern automobiles, there are still chances of accidents occurring. It is a matter of great importance to reduce the number of accidents and protect human lives. One of the major reasons for the loss of lives is the delay of medical treatment of the injured, thereby costing their lives. As technology advances, the need for providing a more reliable system for helping road users increases. We have designed such a system that uses GSM, GPS and smart sensors, to accurately send SMS to the nearby hospitals and to the family members of the injured person, when an accident occurs

Features:

- The system is designed using GSM, GPS and smart sensors, to measure the impact of accident. Also, it will accurately send a message to the nearby hospitals and to the family members of the injured person, when an accident takes place.
- An android app will help to locate the location of the vehicle. And the accident victims' health condition can be monitored by the app till medical help arrives.

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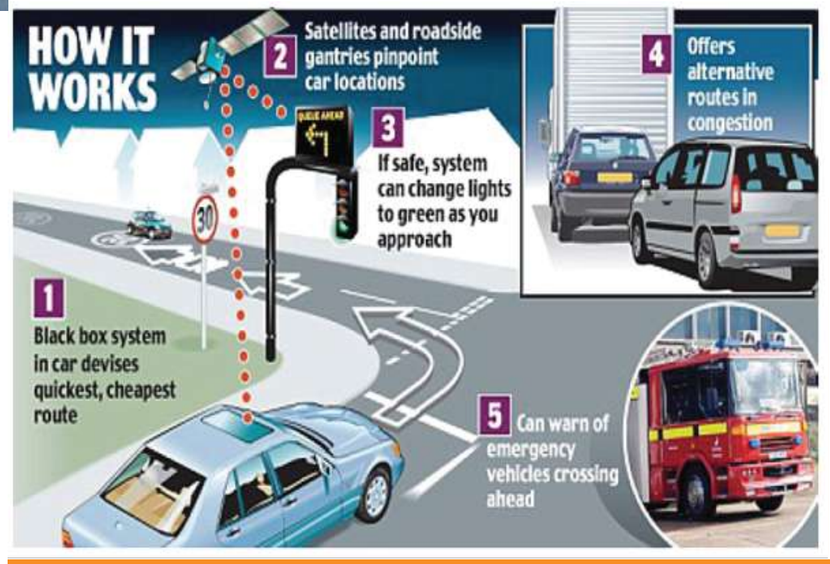
Under critical situations when vehicles face accidents, a lot of people lose their lives. Some of them could have been saved, but due to lack of information on the time and place of the accident, it might not have been possible. The main objective of this project is to provide an optimum solution to this drawback. Hazardous driving can be identified with an accelerometer. It can be utilized as an accident recorder of the developments concerning the vehicle, previously, during and after the accident. The information from the accelerometer, vibration sensor and GPS sensor, which is being put away in the cloud, can be utilized for insights and information investigation. With signals from an accelerometer, a serious mishap can be perceived. And so, when a vehicle meets with a mishap, the area in which the mishap occurred and the victim's contact number will be moved to a police control room or a salvage group, right away. The access to the severity of the accident and the accident location are via a Black Box app. After confirming the location, necessary action can be taken to rescue the accident victims

The BlackBox which has been developed is a step ahead of the existing Black Boxes. There are certain advantages in this BlackBox which will make the entire rescue system easier. Our BlackBox has made use of compact devices, which has resulted in a reduction in its size. The smaller size also makes it easier to be deployed in any vehicle. This BlackBox uses Wi-Fi internet connectivity instead of a GSM module which again speeds up the entire connectivity process. The data is constantly being stored on the cloud database, and is live updated to the BlackBox App from the Database. The entire process is very quick due to the usage of advanced cloud. The app is user friendly, and can be used by any person who has a smartphone. The complete set up and accuracy of our BlackBox makes it more reliable for the users, than the existing Black Boxes and other accident rescue methodologies..



12
PROJECT
CAR BLACK BOX SYSTEM FOR ACCIDENT TRACKING

Bikram Nath
ISE

Tamal Dey
ISE

Kevin Pius
ISE

Dhruvkumar Vekariya
ISE

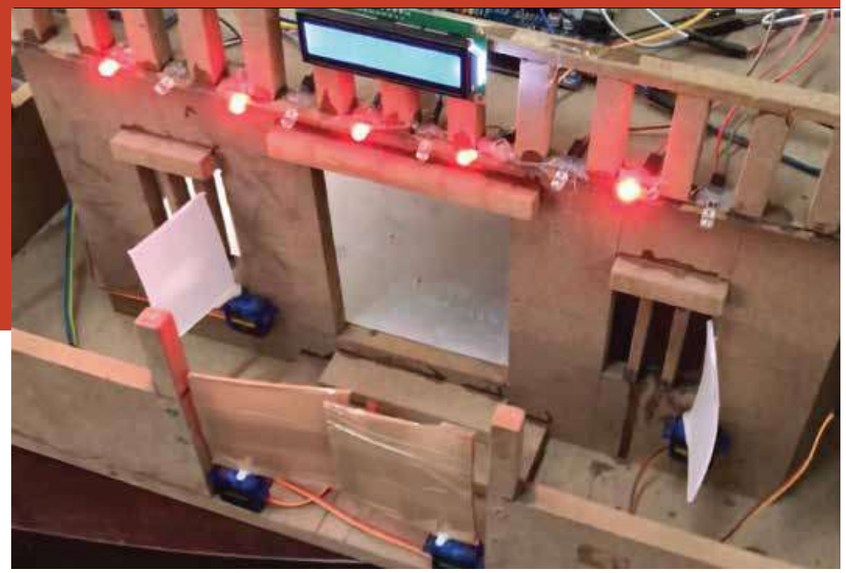
13
PROJECT
SMARTECT SECURITY AND AUTOMATION

Deepak Jangir
ISE

H S Rakshak
ISE

Krishnan Jangir
ISE

Yezdan R
ISE



The Smartect - Smart Home Security System - is aimed at providing smart security solutions to the average consumer. It becomes very tedious to manage, and sometimes impossible to prevent, certain security mishaps such as trespassing, attempts of robbery and fire safety. Also, certain standard tasks such as opening and closing of gates, turning off appliances etc. can be automated, to ease our daily lives. Smartect aims at providing solutions to all of these, through the use of technology such as the Raspberry Pi microcontroller, and Machine Learning concepts such as Image Recognition, Deep Learning and Natural Language Processing.

The system will be fed with photos of the homeowner, providing a biometric feature for access control. In order to detect trespassing, deep learning algorithms will be used, and this will also differentiate between trespassing humans and animals. Cryptographic ttechniques such as block-chaining and hashing have been used which ensures the security of the IoT enabled data. With time, the system will also be able to predict the pattern of the homeowner's day-to-day routine, further upgrading the system's safety. To sum up, Smartect aims at providing a complete package for all safety, security and ease of access needs.

Features:

· Detect faces
· Compute 128-d face embeddings to quantify a face
· Train a support vector machine on top of the embeddings
· Recognize faces in the images captured from the video stream
· Maintain a database for future reference and predictive analysis

14
PROJECT
EYE CONTROLLED SMART WHEELCHAIR

Divya M
CSE

D Lakshmi Soumya
CSE

Kavya G.P
CSE

Wheelchairs have become indispensable for elderly and differently abled people. The electrical wheelchairs that are currently available in the market are mostly controlled by a joystick control system. It may be very difficult, even impossible, for people who are totally paralysed due to amyotrophic Lateral Sclerosis (ALS) and Parkinson disease, to use such type of systems.

This project aims to develop a prototype of a smart wheelchair that is controlled by eye movements and detects obstacles in the path. The smart wheelchair not only controls the movement of the wheelchair, but can also be used for communicating with the caretaker by sending a message to a smart phone. The system consists of four components - image processing module, wheelchair-controlled module, obstacle detection module and appliance-controlled module. The image processing module comprises of a webcam and a customized image processing software. The captured image which is send to a Raspberry Pi microcontroller will be processed using Open CV to derive the 2D direction of the eyeball. The coordinates of eye ball movement are used as the cursor control on the Raspberry Pi screen to control the wheelchair movement via the wheelchair-controlled module, and ultrasonic sensors are used to detect obstacles. And the Arduino connects to the caretaker via an instant messaging app like telegram and sends messages during emergencies.

Features:
• Useful for communicating with the caretaker by sending a message via a smart phone.
• It is controlled by eye movement and detects obstacles in the path.

1. Face and Eye detection

15
PROJECT
BRAILLE READER AND NAVIGATOR

Rohit Natesh
CSE

Ruchitha D J
CSE

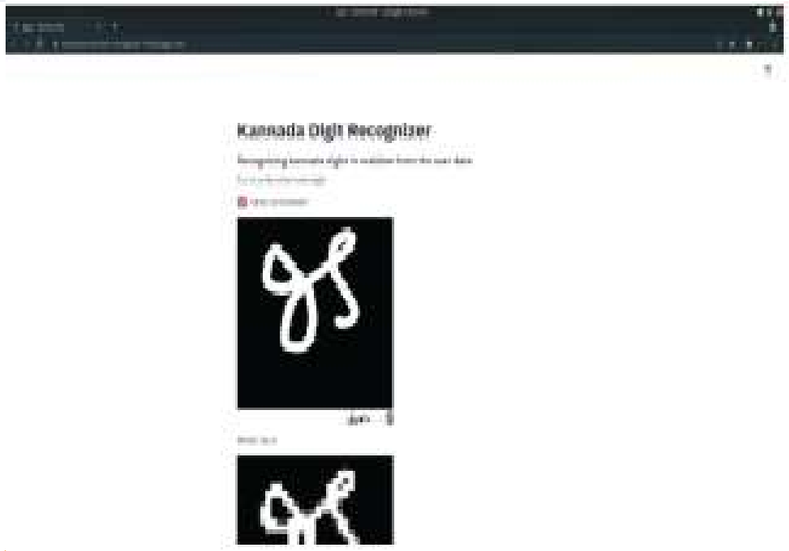
There are around 253 million visually impaired people around the world. They need the Braille form of writing to read. The content produced in Braille is quite limited compared to the regular content. Its availability is also scarce. With increase in the creation and consumption of digital information, visually challenged people have very limited means to access this digital information in Braille. As a result, they have limited access to information from their surroundings, without depending on someone else.

The Braille Reader and Navigator system developed by us, tackles these problems. It generates real-time Braille impressions that can be read by the user. Digital and physical information can be accessed in Braille. The system's navigator functionality helps the users in obtaining information from their surroundings. The system can also help new Braille users to learn Braille. The system is designed and developed to enable the visually impaired to have a friendly interface, with the help of voice instructions and a physical button setup

Features:
- Allows the user to access digital and physical information, to enable the visually impaired to be less dependent on others.
- Helps them obtain information about their surroundings and makes them well-informed about things happening around them.

Handwriting recognition is an important problem in character recognition. It is much more difficult, especially with regional languages such as Kannada. In this regard, there has been a recent surge of interest in designing convolutional neural networks (CNNs) for this problem. However, CNNs typically require large amounts of training data and cannot handle input transformations. Capsule networks, which are referred to as caps Nets recently proposed to overcome these shortcomings and is poised to revolutionize deep learning solutions.

Features:
- Recognizes written characters on cash deposit/ withdrawal/ and other transactions in a bank.
- Recognizes the handwritten account number and amount number on the cash deposit slip.
- Capable of providing a better fit for the digit images.



16
PROJECT
DEEP LEARNING BASED KANNADA HANDWRITTEN DIGIT CLASSIFICATION AND RECOGNITION

Rajput Rohan Singh
CSE

Rahul Kumar S
CSE

Jai Kumar S
CSE

Bandam purna Sai Vijay Chandra
CSE

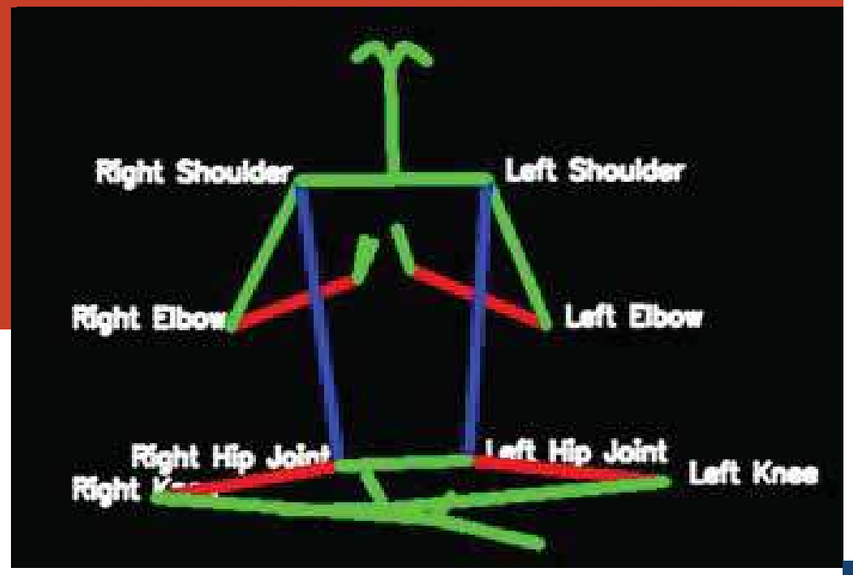
17
PROJECT
YOGA POSE ASSESSMENT FOR SELF-LEARNING

Deepti Singh
CSE

Deepak Pandey
CSE

Hima V S
CSE

Bhaskar Katragadda
CSE



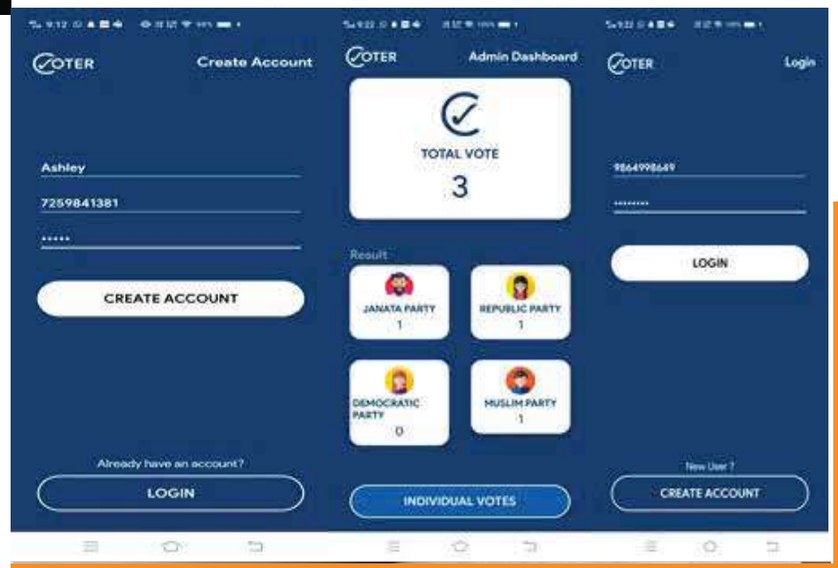
Nowadays, a lot of people are practising Yoga at home, by watching TV/videos. However, without the direct supervision of a coach, there is a good chance that a practitioner may perform the poses incorrectly. And a novice will not be able to find out the mistakes in his yoga poses by himself.

Pose Tracking: It is the task of estimating multi-person human poses in videos and assigning unique instance IDs for each key point across frames. Accurate estimation of human key point-trajectories is useful for human action recognition, human interaction understanding, motion capture and animation. In this project, we use Media Pipe Blaze Pose which is an on-device body pose tracking approach.

Features:
- Can be applied to self-learning systems, to assess and guide yoga practitioners.
- It can indicate the incorrect poses of a learner.

The project is mainly aimed at providing a secured and user-friendly Online Voting System. Voting in India is still critical, in terms of safety and security. Our project deals with the design and development of an Online Voting System using fingerprint, voter ID, face detection and Aadhaar card, in order to provide a high performance, high security voting system. The proposed Online Voting System allows voters to scan their fingerprint, which is then matched with an already saved image within a database that is retrieved from the Aadhaar card database and voter ID number of the government. This voting system is managed in a simple way, as the users must login by their Aadhaar card number and click on the candidate they choose, to cast their vote, by using their biometric fingerprint and face detection. This system provides a lot of security and reduces dummy votes. Here, the voting can be done in two ways so that it will be convenient for all voters – a person who owns a smartphone can vote from his home; a person who doesn't own a smartphone can go to the allotted booth and vote there through the web, by taking the help of the booth officer.

Features:
- Enables voters to cast their vote, by using their biometric fingerprint and face detection.
- No fraud vote can be submitted.



18
PROJECT
ONLINE VOTING SYSTEM, USING FIREBASE ML KIT

Ajitha.S
CSE

Anupama JP
CSE

Aishwarya Raga
CSE

Ankitha Chanda
CSE

19
PROJECT

INTER-CITY ELECTRIC VERTICAL TAKE-OFF AND LANDING AIRCRAFT (ICeVTOLA)

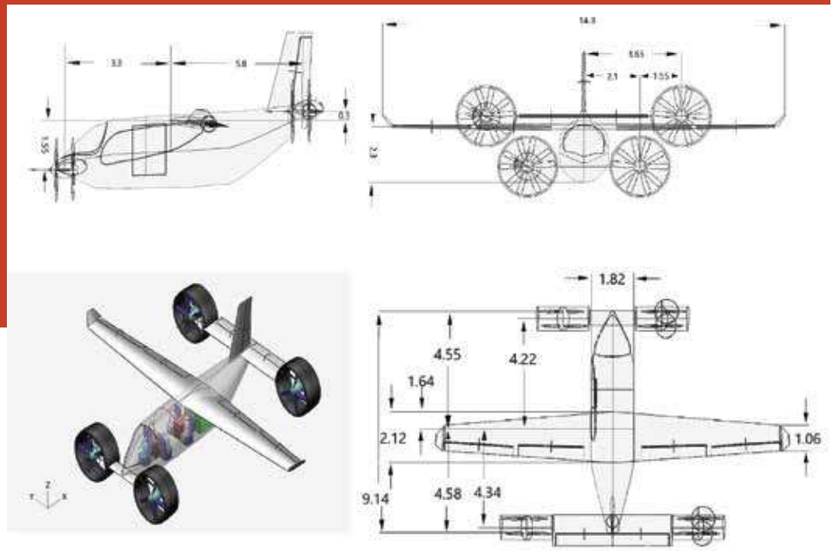
Keerthi G N
AE

Amruthamshu K P
AE

Koushik Udayachandran
AE

Mithun Francis P
AE

Atyab Hakeem
AE



Inter-city Electric Vertical Take-off and Landing Aircraft (ICeVTOLA) is the competition project given by Aeronautical Society of India – Design division, for the National Aeronautical Conceptual Design competition. The task is to design an aircraft with the specified mission and constraints provided by the organizers. The statutory body certification process should be followed or suggested. The manufacturing and operating cost estimations are also a part of the competition.

Features

- Payload capacity: 500 kg
- Air taxi mode: four pax and 0.5m3 cargo hold
- Cruise and Maximum Speed: 200 and 250 kmph TAS
- En-route Maintain separation of >600m

Applications

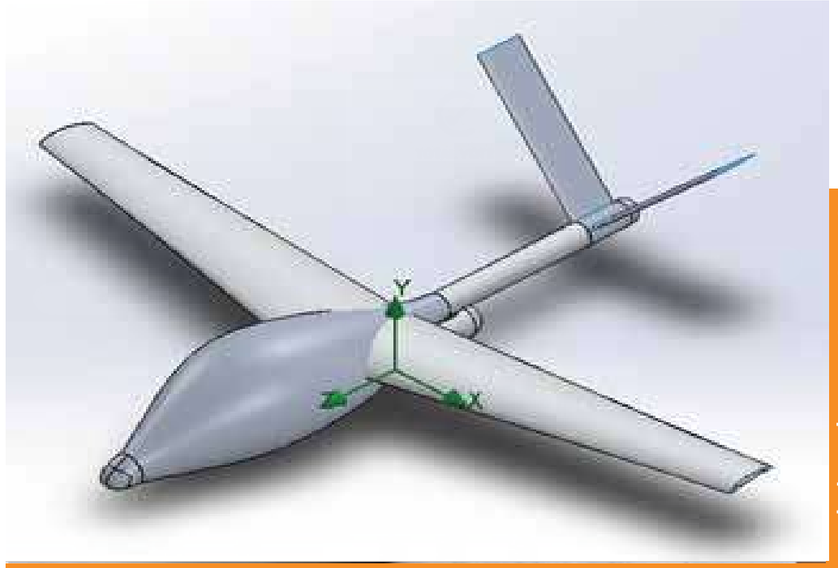
1. Can be used as Air taxi for four passengers
2. Can be used to transport Air cargo up to 1.5m3
3. Can be used as an Air ambulance

This project is aimed to design a small autonomous fixed-wing UAV, for maximum endurance for monitoring of forest fires. The UAV is capable of monitoring and collecting data of both pre- and post-fires. With the help of the data that has been transmitted from the cameras fixed to the UAV, the source of fire can be predicted, and the further path of the fire can be determined.

Difficulty of surveying and conducting surveillance of large areas of land (like forests) is reduced with the help of drones. We aim to reduce the impact of the destruction left by forest fires every year, with the help of our small fixed wing UAV named Trident. Trident will be capable of conducting periodical surveillance of a large forested area, for wildfires and disaster management, with a fantastic endurance of up to 4 hours. For this, extensive optimisation in the UAV design has been carried out in our project, for achieving enhanced capabilities that makes it the best choice for the mission. The above can be achieved with the help of thermal soaring, which is infrequently available in nature. Thermals caused by convection in the lower atmosphere are commonly used by birds and glider pilots to extend flight duration, increase cross-country speed, improve range, or simply to conserve energy.

Specifications for the product are as below:

- Maximum payload – 6 kgs
- Maximum take-off weight - 30 kgs
- Operating ceiling – 2-5 km



20
PROJECT

DESIGN AND DEVELOPMENT OF LONG ENDURANCE AUTONOMOUS MINI CLASS FIXED WING UAV

Koushik Udayachandran
AE

Vijay.S
AE

Sachin Kumar.U
AE

Shreehari.E
AE

21
PROJECT

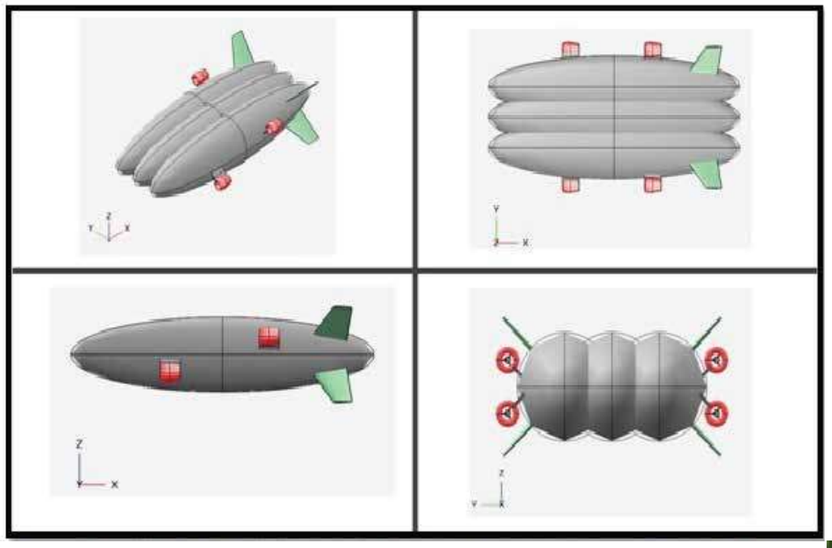
HIGH ALTITUDE LONG ENDURANCE AERIAL PLATFORM (HALE-AP)

Sarthak Dinesh Deshmukh
AE

Nehal Kankanawadi
AE

Patel Amir Abdul
AE

Shireen Naaz



HIGH ALTITUDE LONG ENDURANCE AERIAL PLATFORM (HALE-AP) is the proposed title of the National Aeronautical Conceptual Design Competition – III. Here, an aerial platform (Airship / Aeroplane) is to be designed to fly at Stratosphere (above 12 km altitude) for one year continuously, without landing anywhere.

Features
- Payload - 100 kg
- Power used by the Payload -1000 W
- Lifting gas is helium
- Materials are current off-the-shelf Vectran fibre based fabric
- Endurance - 1 Year
- Range - 3800-3900 km
- Cruise Altitude - 15-20 km

Applications
- Civil Aerial Survey
- Military reconnaissance and surveillance
- Local Internet connectivity

22
PROJECT

DESIGN AND FABRICATION OF ELECTRIC BIKE

This Project is about the Design and fabrication of Retro Fit Electric Bike, as per the norms and regulations of Skill Employability 2nd Season of E-Bike Challenge-2021, powered by Hero Electric, organized by Imperial Society of Innovative Engineers – ISIE INDIA, with the Society of Manufacturers of Electric Vehicles –SMEV being the Principal Industrial Partner.

The innovative feature of this fabricated E-Bike is a dashboard which shows the speed, battery charge level and temperature of the battery. The chassis of the Bike has been modified as per the requirements, to hold the relevant battery with hub motor for power transmission. This battery can perform in the range of 60-70km per charge, which varies based on speed, on a 3-mode run-top speed of 80km/hr.

The fabricated E-Bike has undergone technical inspections and brake tests such as Acceleration Test, Sled Pull Test, Hill Climb Test, Off Road Test, Real Time Parking, Self-Balanced Run, Vehicle Run Based on Modes and Durability Test. Our team of students have won four awards, namely for Best Design and Aesthetics, for the Best Hill Climb Test, Best Speed Limiter and Future Award.

Praveen B
ME

Sandeep K M
ME

Sanjay A
ME

Shivalinga N
ME

Shivaraj N V
ME

Sandeep M
ME

Srinath S R
ME

V N Ashrith
ME

Varun G S
ME

Veekshith K V
ME

23
PROJECT

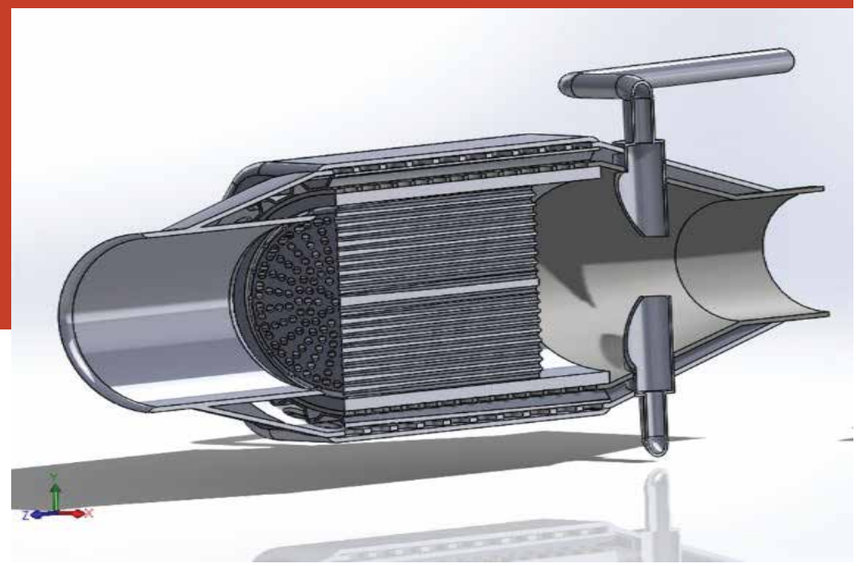
ARTIFICIAL INTELLIGENCE BASED DESIGN OF SMART EXHAUST SYSTEM IN AUTOMOTIVE SYSTEMS

Ankush Ghoshal
ME

Aylwin Pierre Johnson
ME

Faraz Khan
ME

Gokul V
ME



With the increasing demand for greener mobility solutions and eco-friendly and sustainable transportation solutions, it becomes our responsibility as engineers to ensure that this is made possible in the easiest, most effective way possible. With this in mind, this Project was envisioned. The objective of the Project is reduction of exhaust emissions, real time and predictive analysis of Emission Data using Machine Learning, substantial real time exhaust gas analysis and monitoring, robust and sustainable modular product and cutting down carbon footprint.

Features:

- The Project involves an exhaust system of porous cordierite ceramics ($2MgO•2Al_2O_3•5SiO_2$). The ceramic is made rather fire-resistant, to maintain a temperature up to 800-850°C. The exhaust gases from the vehicle pass through the sensor bay. The sensor bay detects the respective constituents of the exhaust gases. The collected data is then sent to the Arduino Uno microcontroller, for further processing.
- Using the Machine Learning model, we retrieve the emission data that has previously been stored, to be used for the Emission analysis and building the predictive model, which also shows us the real time performance of the Exhaust system.
- The emission results of the Machine Learning model are represented or displayed in a readable digital format. All details pertaining to the Vehicle Emission are displayed.

Recently, bio composite materials are being synthesized using natural cellulose fibres as reinforcements together with matrix, which have attracted the attention of researchers, due to their low density with high specific mechanical strengths, their availability, renewability, and their being degradable and environment-friendly. The present work attempts to make an improvement in the existing helmet manufacturing methodology and materials used, in order to have better mechanical properties and also enhance the compatibility between fibres and the matrix.
The helmet is prepared using pineapple leaf fibre reinforced into epoxy resin matrix using hand lay technique. First, the pineapple woven fabric is cut to the required dimension and weighed. The interior thermocol of an old helmet is used as the mould for the preparation of our helmet. Based on the dimensions of the fabric, the mass of epoxy needed is calculated, and the woven fabric is wetted in the matrix medium. The wetted fabrics is laid on the mould, prior to this, the silicon releasing agent is applied on the mould for easy removal of the casted samples. The moulds are cured at room temperature for 24 hours and then removed. Post removal, the extra projections are trimmed using a hex blade. The helmets made thus are stiffer than the commercially available helmets. Fabric delamination is observed, and minor wrinkling effects are seen that can be removed during process optimization.

Features:

- This helmet is made from pineapple natural fibre.
- These helmets are stiffer than the commercially available helmets in the market.
- We can save up to 50% plastic usage through these helmets.

24
PROJECT

DESIGN AND FABRICATION OF BIO-COMPOSITE HELMET

Channaveer
ME

Karthik G
ME

Manoj Kumar S
ME

Mohammed Arifulla S
ME

25
PROJECT

DESIGN AND FABRICATION OF AUTOMATED PAPER BAG MAKING MACHINE

Shoaib Saeed Khan
ME

Rahul P
ME

Hemanth Reddy J
ME

Using carry bags has become a very convenient way to carry our shopping and it is very useful for packing small quantities of things. The most well-known form of such carry bags is the plastic bag. Despite all the well-known hazards of plastic pollution, the use of plastic is prevalent and all-pervasive in India. Plastic bags are one of the worst and totally avoidable polluters of the earth. Plastic bags are used on a large scale by retailers, for the simple reason that they are cheaper than paper, cloth or other eco-friendly bags. Our Project is about automating paper bag production, to make the paper bag a viable alternative to plastic bags.

Features:

- The Project involves the design and development of a machine to automate the procedure of paper bag production, so as to make it cost less compared to plastic bags. In turn, the production rate of paper bags will be accelerated, fulfilling the ever-increasing demand for carry bags.
- Our Project works on the application of a microcontroller-based design approach, which keeps the cost of the system significantly low, compared to PLC based designs.

Electric vehicles are not just an alternative means of transportation, they also save lives. To solve the problem of climate crisis, we need to make the vehicles on our roads as clean as possible. A smaller carbon footprint compared to that left by gasoline-powered cars is our biggest weapon against rising global temperatures. The Indi-wheel represents a new technology in the commuting industry, and it is sure to revolutionize transportation. Following the concept of 'Empty beneath the bonnet', an Indi-wheel is a conventional wheel housing an in-wheel motor, in-wheel suspension system, disc brake and steering system. Functions of all the components are controlled by an electrical system. The implementation of the technology of Indi-wheel opens up a gateway to better handling, performance, safety, ergonomics and drive comfort of an electric automobile/vehicle, compared to the conventional vehicle technology.

Features:

- The Indi-wheel is a design based on the concept 'empty beneath the bonnet', it makes commuting safe, reliable and comfortable.
- It is a wheel housing with in-wheel motor, friction brake, steering system and suspension system.
- Suspension design and Ackerman's steering angle have been developed.

26
PROJECT

DESIGN OF INDI-WHEEL FOR IMPROVING OVERALL DRIVE EXPERIENCE OF E-MOBILITY

Bhavana Veeresh Ghali
ME

Santhosh S
ME

Bharath
ME

Vandana H S
ME

27
PROJECT
BBOOK

Rohit N
CSE

Ruchitha D J
CSE

> "A book is a dream that you hold in hand."

There are more than 300 million people amongst us who can hold a book in hand but cannot see or read this dream. They are visually impaired.

Braille is a writing system which helps them read and understand. The problem with braille material is that they are scarce (only about 1% of content in braille), heavy (500 pages braille book weighs around 4kg) and mainly expensive (by nearly x10 times). People are also gradually shifting from physical forms of information consumption to digital. This is leaving the visually impaired stranded with very few means to access this information.

Features

- bBook is an affordable and easy-to-use device and empowers the visually impaired through literacy
- Handheld braille reader which converts text to braille in real time. This will enable the visually impaired to read any digital or regular material in braille in real time
- bBook can access the latest news articles and magazines of interest to the user, and make it available in braille format
- A specially designed audio interface is provided to assist the user in using the device

The Smart Helmet was designed keeping in mind the increasing number of causalities on roads, mining sites and construction sites.

Welcome to the future of commute:

- Made of a hard, sturdy, durable and light-weight material.
- Comes with MIPS (multi-impact protection system) technology for better protection.
- Has integrated GPS system, accident-detecting and alert system. Whenever the wearer meets with an accident, the helmet detects and sends the coordinates to the emergency personnel.
- A physical switch/SOS button that can be used in case of other emergencies.
- It is incorporated with gas detection technologies (alcohol/toxic gas) which ensure that the helmet is worn in a stable condition.
- Data is tracked, controlled and fed to the helmet wirelessly through a mobile application.
- Helmet is further connected to other external modules of application to enhance the functionality

SaivenketPatro
ECE

Megha S
ECE

Nikitha S
ECE

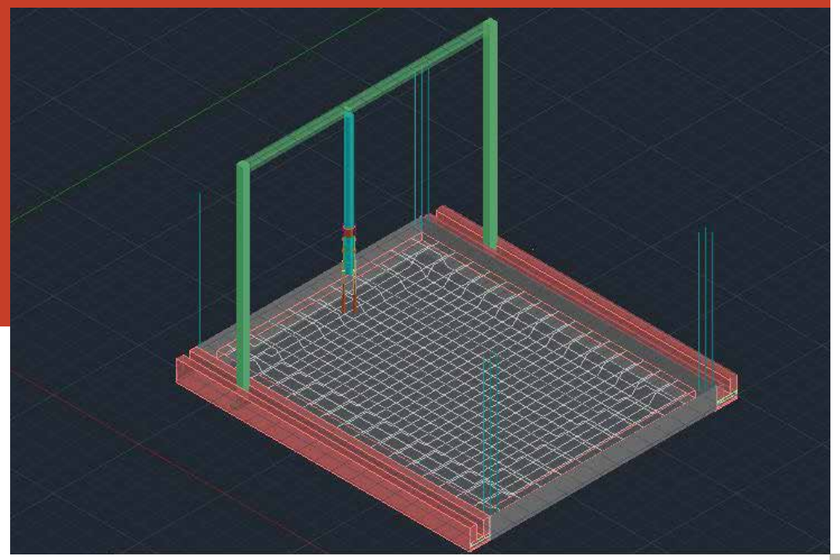
Suvarpratimroy
CSE

28
PROJECT
SMART HELMET

29
PROJECT
AUTOMATED CELLULAR CONCRETE POURING AND COMPACTOR

Mallikarjun T A
CIVIL

Nikhil P S
CIVIL



In the construction of RCC structures, a set of procedures are followed: batching, mixing, transporting, pouring and compacting of concrete and cutting, bar-bending for reinforcement and finally finishing and curing.

Automation in this area has been limited to pumping of concrete using RMC plant and transit mixers. Until now, concrete pouring and compaction has been done manually, a task that is both time-consuming and requires skilled labourers.

Compaction of concrete, an important component in laying a concrete structure, expels entrapped air from freshly placed concrete and packs the aggregate particles of the concrete mix together, increasing the density of the concrete. If compaction is not carried out correctly, defects may become apparent and the concrete structure will suffer from significant loss of strength. This project has now automated the process of laying concrete and its compaction.

Features

- Compacters are combined with the hose pipe of the concrete pump, through which concrete is poured. This is followed by compaction using needle compacters for a fixed period of time
- The whole setup is supported by the frame structure, which is accessible from all the three axes
- Can be monitored manually or digitally
- Results in higher accuracy and is cost effective

Sand is used in construction, manufacturing and related industries. Sand needs to be filtered and separated from unnecessary stones and other large particles before it is put to use. This system is designed to do just that. The device is a fully-automated filtering and separator system that filters sand poured on it.

Features

- Motorised shaft that is mounted horizontally using mounts
- Shaft is connected to a filter frame with a mesh below and enclosing frame on the sides
- A rod is connected from the shaft to the filter frame to achieve the best horizontal motion
- A frame holds the filter frame in place
- Finally, the motor is operated using the motor controller circuit
- The sieve is a one-stop-shop for all sand filtering requirements

30
PROJECT
THE SAND SIEVE PROJECT

Praveen M
CIVIL

Devappa
CIVIL

Lalish M
CIVIL

Murali T Y
CIVIL

31
PROJECT
SOLAR PARABOLIC COLLECTOR TO POWER RURAL INDIA

Bikash Chandra
ME

Avil Crasta
ME

Abishiek
ME

Kouti
ME

Certain rural areas have high solar resource availability, and with little to no access to electricity service or even resources to purchase a stove. The solar collector prototype proposes a solution to solve these issues and uses sunlight for operation.

Features

- Solar radiation is concentrated into a specific area called focus, where thermal energy is generated
- Use of aluminum parabolic trough reflectors instead of traditional solar collectors provides a better alternative to generate higher temperatures with better efficiency
- The parabolic trough reflector is a solar energy collector designed to capture the sun's direct solar radiation over a large surface area and focus or "concentrate it" onto a small focal point area, increasing the solar energy received by more than a factor of two
- Also, parabolic troughs have a small absorber area and have efficiencies of around 12% with smaller angle of view
- Reduces energy costs over time as they do not use fossil fuels or traditional water heating systems
- In domestic settings, a large number of these troughs can be combined in an array and used to generate electricity in solar thermal power plants
- The device has low adverse environmental impact and low cost

A robotic pet is an artificial intelligent machine created within the image of an animal like dogs, cats, and birds. The pet bot has a range of interesting applications, especially in the safety and companionship of the elderly living at home alone.

Features

- The Pet Robot detects the face of the user, extracting the features and acknowledges it using OpenCV. If any foreign face is found, then live transmission will be viewed in VLC media player by the user
- A number of the voice commands such as "Follow the user", "Sit", "Stand" can be used. Voice control is enforced using python libraries and Google API
- GPS is used to track the bot and is also linked to Google Maps. The location, and any unfriendly face or intruder detection is sent through a message
- Pet Robot may show emotions through colorful LEDs. It also notifies the user once the battery is low
- Medication reminders can be set up along with the dosage of medicines to Senior Citizens

32
PROJECT
RASPBERRY PI BASED PET ROBOT FOR HOME SURVEILLANCE

Sukeerti T
ECE

Supriya V
ECE

Suraj Kumar Mishra
ECE

Syed Mohsin Pasha
ECE

33
PROJECT
IOT-BASED SOLUTION FOR SMART GAS MONITORING

Koushik P
ECE

Manoj B N
ECE

Pavithra A
ECE

Raviraja
ECE

Considering the inherent safety risks that poses in laying gas pipelines to each house, we are forced to rely on LPG cylinders. Booking LPG cylinders through IVRS or online can also be quite troublesome for busy individuals, especially since it is difficult to accurately deduce the level consumed. Additionally, the landline telephones may not always be functional or clogged with too many calls. This project is a welcome relief to all these problems.

Features

- The weight of the cylinder is constantly monitored by the system. A notification is sent to the approved LPG agent as soon as the weight drops to the minimum limit.
- Any leakage of gas is also automatically detected and reported through an alarm

Non-degradability of plastics is a global concern. This research involves degradation of HDPE and LDPE plastics by pyrolysis and fractional distillation of the by-product vapours. The process involves fabrication of the furnace/reaction chamber, oil extraction, oil testing (octane number, cetane number, flash point, fire point and viscosity analysis) and real time engine testing. The methodology adopted is efficient and socially relevant and the fuel obtained is the key solution for the rising energy demand of the country and the fast depleting non-renewable resources.

34
PROJECT
PLASTIC WASTE TO ENERGY — AN INNOVATIVE TECHNOLOGY

N N Nikhil
ME

Chris Stephen
ME

Vivian Marion George
ME

Arsh Ahmed Parvez
ME

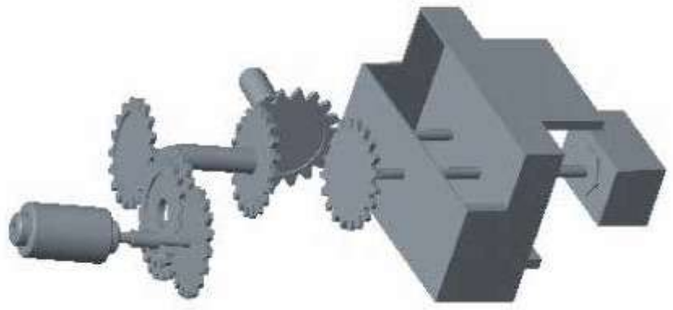
35
PROJECT
DESIGN AND DEVELOPMENT OF ENERGY STORAGE SYSTEM FOR PROLONGED RETRIEVAL

Ganesh S Nayak
ME

Arunakumar Chunchoor
ME

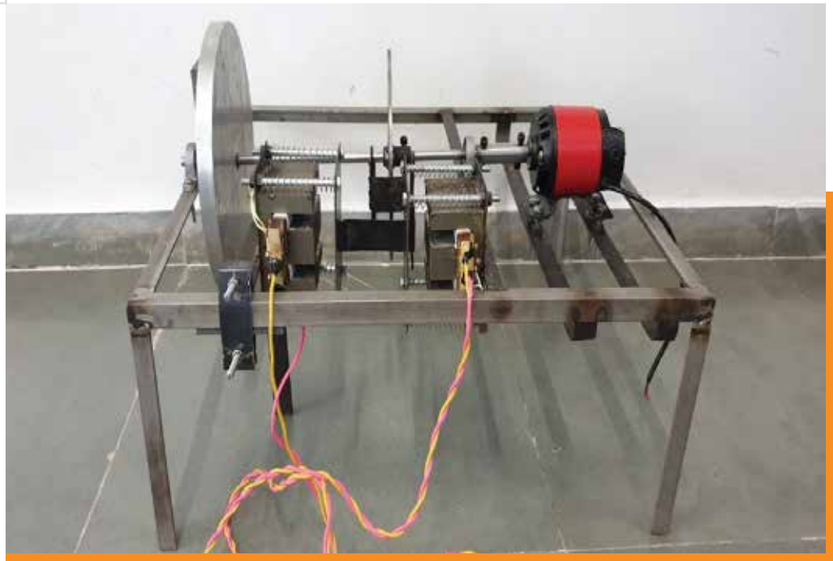
Chaitanya Deskulkarni
ME

Kiran Jamakhandi
ME



This technology focuses on a storage system that helps store potential energy in springs. The system uses compression, torsion, extension or leaf springs to store energy. Input energy in the form of solar, wind, hydro or any other type of renewable source of energy is used to compress the springs through an apparatus. The potential energy in the compressed spring is used to run a generator, which provides power to the consumer during the peak hours, so that expensive electricity can be avoided.

The steady development in automobile industries has made cars faster, but there hasn't been significant development in the safety and efficiency of brakes. There is a need for developing a safer and efficient braking system. This project aims to create a hybrid braking mechanism which is a combination of eddy current braking mechanism and electromagnetic braking mechanism. It provides a better braking mechanism for high speed vehicles by reducing the wear and tear of brake pads at higher speeds by eliminating contact. The mechanism uses eddy current braking at very high speeds and electromagnetic braking at lower speeds to bring the vehicle to a complete halt.



36
PROJECT
DESIGN AND FABRICATION OF A HYBRID BRAKING SYSTEM

Alfred V K
ME

Aman Vishwakarma
ME

Badal Dey
ME

Brain Lara
ME

37
PROJECT
PROGRAMMABLE AND LOW-COST ULTRAVIOLET ROOM DISINFECTION DEVICE

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Koushik M S
ECE

Ratan Anil Kamat
ECE

Yashwanth T L
ECE

The use of commercial proprietary equipment for UV-C radiation of the environment entails a significant cost to acquire the equipment and maintain it, because it is a proprietary technology. Most of the available equipment use low-pressure mercury lamps to produce UV-C radiation. These lamps can be acquired separately and used in the disinfection device we have created.

Features

- The system is easily scalable and can generate higher ultraviolet dosages by adding on more UV-C lamps
- The total cost of making this open source device is below USD 180 and it is easily customisable
- The device is configured in less than three minutes and does not require continuous monitoring
- The room disinfection device was initially designed for the periodic conditioning of culture rooms. Experimental tests showed very high effectiveness of this device to eliminate high bacterial inocula. The sanitising method employed by this device affects a very wide range of microorganisms and it has several advantages over chemical-based sanitising methods

In the wake of increased use of landmines in high-risk area, an All-Terrain Rover has been designed with the purpose of detecting these mines. The intention is to provide safety through technology, whose worth is much lesser than a soldier's life.

The rover detects landmines with a detector that is placed at a distance of seven centimeters above the ground level. It can detect mines within a range of twelve centimeters with the sensor present on its body. The moving mechanism employed by the rover detects explosives buried beneath harsh military routes and passages

Features

- A six-wheeled rover based on the rocker bogie mechanism to overcome harsh terrain
- Made using light PVC (Polyvinyl chloride) pipes for better manoeuvrability and power to weight ratio. Also, PVC possess enough strength to keep the entire structure and its components intact
- Powered by a LiPo battery and houses six metal gear motors, one for each wheel. The controller interacts with the rover through a pair of transmitter and receiver
- An Arduino microcontroller board connected to the circuit provides varying torque in all wheels for turning the rover
- Solar panel for extra power backup

38
PROJECT
ALL-TERRAIN ROVER TO SAVE LIVES IN THE INDIAN ARMED FORCES

Ajyaz
ECE

Akshay D L
ECE

Bharath V P
ECE

Hima V S
CSE

Inchara R
CSE

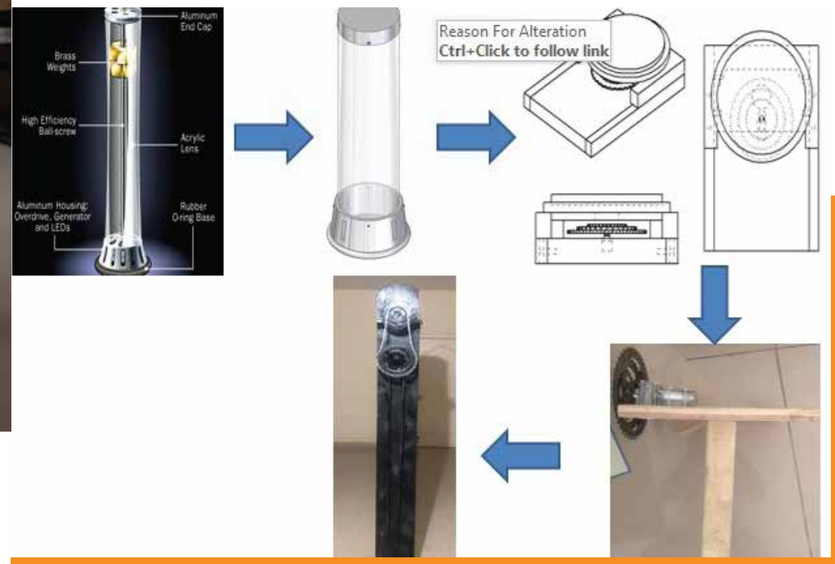
Meghana M C
CSE

39 PROJECT

MAGLEV WIND TURBINE: AN ALTERNATIVE, CLEAN ENERGY SOURCE

The ever-increasing demand for power is leading to the depletion of conventional resources, which can easily be met by natural resources. Wind energy, for instance, is utilised by wind turbines to generate electricity by harnessing the kinetic energy of wind. Though conventional wind turbines are widely used, they have many drawbacks including friction, regular maintenance, and disturbance to surroundings. These problems can be minimised by implementing a maglev wind turbine, in which friction is greatly reduced by the magnetic levitation and need for regular maintenance is drastically reduced. A miniature maglev turbine can be used for residential purposes. It can produce power sufficient to charge a battery, which can be used to power appliances.

The demand for electricity is on the rise, and in a rapidly developing country like India, electricity still remains a luxury for many villages and remote towns. Challenges include frequent power outages caused by excessive power demand, poor plant load factors, transmission losses and the inability to reach every corner of the country. A possible solution has been identified in the form of gravity. Gravitational potential energy is stored in a mass raised to a height above the Earth's surface. With the help of this potential energy stored in the falling mass, electrical energy is generated by a dynamo, which is then used to power LED bulbs. This experimental study aims to make the entire arrangement of the gravity light compact, and to reduce the weight being used, thereby making the method feasible to move.



Faraz khan
ME

Avulasohit
ME

Nileena James
ME

Madhuri
ME

40 PROJECT

DESIGN AND OPTIMISATION OF GRAVITY INDUCED LIGHT GENERATION UNIT

41

PROJECT

COMPACT STANDING MECHANISM FOR THE ELDERLY/ SPECIALLY-ABLED

Dhanaraj M Banakar
CIVIL

Sit-to-stand (STS) is a crucial function influencing a person's independence in daily activities, as well as safety and quality of life. People with muscle weakness often require assistance to raise them from a seated position, or to lower them into a seated position in a controlled manner in order to avoid injury.

According to a survey of elderly people at home and nursing care, the main concern is about their weak legs and difficulty to stand up from a chair. Roughly 6% of community-dwelling older adults experience significant difficulties with STS, a major risk factor in institutionalisation. Muscle strength further decreases with age and increases the difficulty to rise from a chair. As a result, there is a need for a standing mechanism so that the specially-abled an elderly can be independent as well as boost their confidence level.

On comparing seat, waist and arm assistance modalities in elderly population, the team discovered that the seat and waist assisted modalities were most efficient. Initially, the calculations for selecting the motors with suitable torque and the lead screws were done. Then the kinematic analysis of the links imparting the motions were done. A 3-D CAD model of the design in CATIA was developed and the team performed structural analysis in ANSYS Workbench. From the results obtained, a system was fabricated and tested in real time.

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PROJECT

AN APP CONTROLLED HYDRAULIC JACK TO FIX FLAT TYRES

Sachin Basarkod
ME

Sharanukumar
ME

Hydraulic jack is a device used for lifting heavy loads by the application of smaller force. It is based on Pascal's Law which states that the intensity of pressure is transmitted equally in all directions through a mass of fluid. Lifting the car to replace a wheel or fix a flat tyre is not easy. For these types of operations, we need heavy force. Traditional ways to lift a car are difficult for the physically challenged or the aged. In this situation, an automatic app controlled hydraulic jack is more useful.

Features

- The entire assembly is controlled by the app
- The brain of this project is the control unit Arduino Uno which controls all the motors by receiving signals from the app with the help of a Bluetooth module (HC-05)
- The contraption is passcode protected, making the system encrypted and secure
- Helps overcome drudgery, musculoskeletal disorders, reduces the time consuming to operate

43

PROJECT

HYBRID ELECTRIC BIKE

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Bharath B
ME

Bharath Raj M
ME

Praveen Kumar D
ME

This Hybrid Electric Bike mainly focuses on energy conservation and pollution control. As compared with conventional internal combustion (IC) engines, fuel consumption in this bike is lower, mileage is better, and the pollution is lesser.

Features

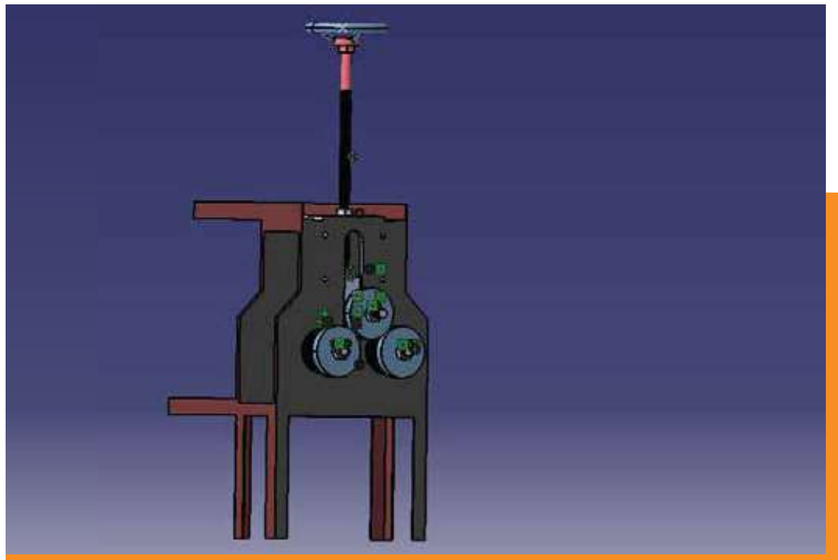
- Light in weight owing to the compact hub motor in the front wheel, which is powered from a lithium-ion/SMF (sealed maintenance free) lead acid battery
- Three different ways of charging the battery are incorporated: 220V AC wall outlet, energy from IC engine, and regenerative braking
- Power assisted cycling by regenerating power from IC engine through alternator and charging the battery facilitates longer distance commute
- Addresses electrical switching between engine and motor power to achieve smooth power transmission to the wheels, thus reducing fuel consumption. A conventional sequential-based switching control operates the system with the motor at low speeds and the engine at higher speeds, using the number of rotations per unit time as the switching parameter. Alternatively, a kill switch can be used to switch manually without any sensors and programming

A bending machine is used to bend a metal rod, bar, sheet or pipe. Earlier, these bending operations were performed using hammers and human efforts. The manpower requirement was more and the operation was expensive, time consuming, and less productive.

There is no proper small-scale bending machine for bending a pipe or rod. The team conducted a number literature surveys of different kinds of bending machines available in the market, and analysed different parameters like cost, speed, wrinkle formation, portability, production time, accuracy etc. Based on the learning, the team has designed the vertical roller press bending machine using CATIA V5 software and a prototype model. The machine uses three rollers to bend metal pipe or rod. During the roller bending process, the metal rod, metal sheet, bar and pipe is passed through consecutive rollers that gradually apply pressure on the pipe, which changes the curvature of pipe or sheet.

Features

- This bending machine bends metal rods, bars and pipes into a curve or angular section and also into other curvature shapes
- Can bend up to 20mm diameter of mild steel rod
- The size of the machine is very small compared to other bending machines



44

PROJECT

VERTICAL ROLLER PRESS BENDING MACHINE

Bikas Chandra
ME

Avil Crasta
ME

Abhisheak
ME

Kouti Abhisheak
ME

Gautham
ME

Vinay sharma
ME

45

PROJECT

FLOWING THE SMART WAY

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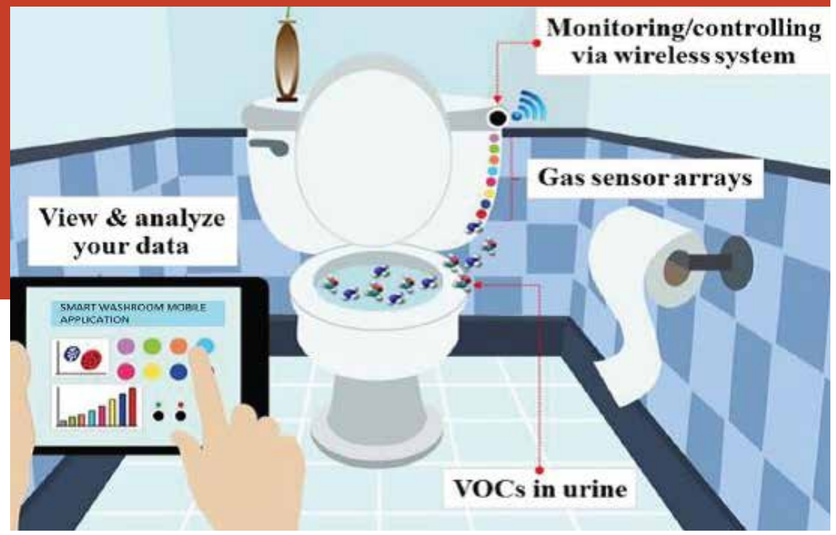
Supriya Sarangi
CSE

Y Spurthy
CSE

Thanuja P
CSE

Shiladitya Ghosal
CSE

Aayushi Kheria
CSE



In the roadmap to a smart and green urban society, sanitation is an important milestone. Currently, using toilets is neither smart nor green. Every flush of common toilets sends about 13 - 16 litres of fresh water to wastewater treatment centres. These processes require 3 – 15 kWh for treating just one cubic meter of wastewater. Another problem is the mixing of urine and faeces from the source, necessitating wastewater treatment. Due to common technical water supply problems such as pipe blockage and leakage in the pipe system, current toilet systems are not functional. However, many of these problems can be solved using smarter designs.

Features

- E-Loo uses less water thereby reducing water consumption
- Integrated with sensors such as gas sensor for bad odour detection, water level sensors and water flow meters along with load cells for monitoring effective water supply as well as water leakage
- Improved flushing systems using Solenoid valves
- Special light and handy toilet seats for sanitation
- The seat cover and the toilet surface are sterilised by adding a sterilising agent. The toilet surface is kept viscous in order to avoid surface contamination
- When sensors detect a need for a human assistance to keep the toilet clean, an alert is sent to the janitors directly
- An app is available to collect feedback from the users

Electronic gadgets such as laptops, phones and tablets have a processing unit called microprocessor, which does all the work of transferring the data and follows instructions to complete the task assigned by the user. While working, these processors produce heat. This heat is as high 80-degree Celsius, which can cause second degree burns; on high exposure, it can even lead to third degree burns. To avoid this, a heat sink that can dissipate around 60-70 degree Celsius is used. A teg sink, developed by the team, can be more effective than the traditional heat sinks.

Features

- A teg sink controls heat dissipated from the system
- When the system is under normal workload, it produces less heat, which the teg sink converts to electrical energy. This, in turn, can be used for charging phones and laptops. In the case of PCs, it can be used to run low powered fans
- The turbo cooling property of the teg sink comes in handy when the system is on high load leading to more heat dissipation
- Cost is cheaper than existing market solutions at INR 1000
- Has a lifetime of 100,000 hours
- Better solution compared to the expensive liquid-based coolant

46

PROJECT

TEG SINK

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Pritam Pawan D
ECE

47

PROJECT

AUTONOMOUS FIRE SUPPRESSION SYSTEMS

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Meghana A
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Nandini S
ECE

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ECE

Fire outbreaks are the third biggest risk to business continuity and operations, in addition to loss of life, according to India Risk Survey (IRS) 2018. The ADSI report shows residential buildings are most prone to fire outbreaks.

One method of avoiding fire breakouts in residential places is through the installation of an automatic fire sprinkler system. A sprinkler head is an automatic tap connected to a pressurised water system. When the fire heats up the sprinkler head, it opens at a pre-set temperature, allowing the pressurised water to be sprayed onto the fire, while simultaneously activating the alarm. But this system is expensive and the installation is complex. This project's autonomous fire suppression system overcomes these problems.

Features

- Use of single sprinkler in each room. If the temperature rises above the set-threshold value and is persistent, an alarm gets activated
- The controller gets the location of the fire and directs the sprinkler head to move into that particular area
- The sprinkler head which is connected to a pressurised water system, opens and sprays onto the fire
- This system increases the accuracy of fire detection and prevents false alarm.
- Usage of similar mechanism based on the material placed in the room, extinguishers and the type of sprinkler head being used

Nurse Call System is an essential requirement in hospitals and healthcare facilities. The basic idea of this project is to design and implement a complete wireless nurse call system in the hospital, displaying the patient room number on an LCD and send a message to the duty mobile.

Features

- Awireless nurse call system using NRF24L01, GSM module and Arduin
- The system helps patients in general wards of hospitals
- A patient can call a nurse or patient care assistant (PCA) for help by pressing the button provided
- This system is also capable of generating blue code messages delivered to the duty mobile given to the doctor
- When a patient calls a nurse, the system updates the patient's bed number on the LCD display placed in the nurse's station
- The system implements a smart controller and several wireless switches using RF technology to continuously monitor and display the state of any room / patient

Figure 3. System design idea.

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PROJECT

WIRELESS NURSE CALLING SYSTEM

Paavana S
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Pushplatha S
ML

49
PROJECT
E-BIKE: READY, SET, GO!

Abhikarthik P P
ME

Mohan K M
ME

Ranjeeth A B
ME

Surya S
ME

This electric motor-powered bike reduces the usage of fossil fuel powered vehicles.

Features

- Alternate materials to reduce both static and dynamic forces in pursuance of improving the efficiency and performance of the bike
- Detailed design of subsystem like chassis frame, handle and suspension, electric power train and braking mechanism has been done effectively
- The frame has been designed to ensure the safety of the rider under maximal impact load conditions
- The motor, the heart of the electric vehicle is an induction motor that performs well for an extended time
- Speed control is maintained using the voltage regulator
- The bike is provided with a chain drive to achieve maximum efficiency while transmitting the power from the motor to the wheels
- Drum disc brakes provide smooth and effective braking under both dry and wet conditions
- Bike tires are used to provide more traction

The monowheel is a personal vehicle to carry a human operator from one point to another. In industries, people walk long distances to travel from one work site to another worksite. The monowheel reduces human effort and also saves time in commute.

Features

- Electric Hub wheel acts as the main drive
- Consumes energy from a rechargeable battery, which reduces pollution
- Smaller in size compared to conventional bikes

50
PROJECT
MONO WHEEL BIKE

Bharath B
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Vishnu Maheshwar
ECE

VenuPrasad A
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Sheetal Sahu
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Badri Nath A
ME

51
PROJECT
PEDAL OPERATED WASHING MACHINE

Lalish M
CIVIL

Pedal power has been used to propel bicycles for over a hundred years. Less commonly, pedal power has been used to power agricultural and hand tools and even generate electricity.

All washing machines available in the market today are electric power driven and basic principle of their operation depends upon creation of the turbulent flow of detergent around the dirty clothes. But a washing machine remains a dream for people from poor economic status, who work under severe cost constraints. This cost-effective Pedal Operated Washing Machine is just the right solution

Features

- Low weight and portable
- Does not require electricity. A simple cycling mechanism runs the machine shaft
- Flexible mechanism that meets the needs of 70% of the population of the nation
- Working principle of this concept is similar to conventional machine with a sole difference in the driving mechanism of the machine

This project explores an alternative naturally and locally available material for construction to reduce cost of construction and increase the green value of the property.

Alternative Solutions

- Steel replaced with bamboo
- Manufacturing of steel is a costly process. Bamboo has properties such as tensile strength, high strength to weight ratio, grows quickly. It can treated with borax acid for increased durability
- Cement concrete replaced with mud concrete
- Helps reduce Carbon footprint
- Burnt bricks & cement concrete blocks replaced with stabilised mud blocks
- This solution is cost effective and sustainable and can be designed to achieve customised strength

Nikhil K S
CIVIL

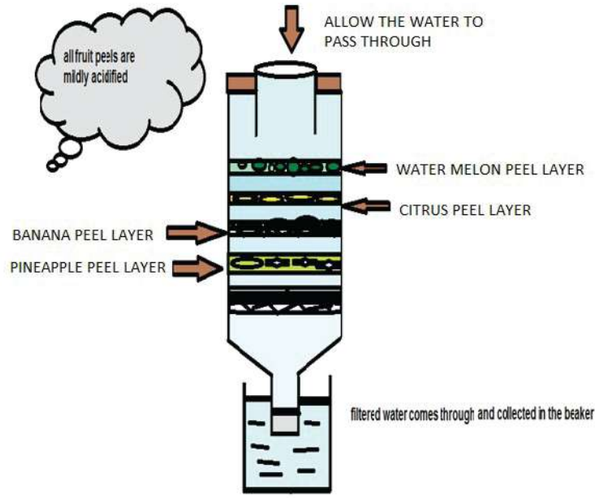
Sanjay B S
CIVIL

Eshwar R
CIVIL

52
PROJECT
BAMBOO REINFORCED MUD CONCRETE

53
PROJECT
LOW COST BIOTIC SEMI-PERMEABLE MEMBRANE USING FRUIT PEEL WASTE

Pavan A
AE



This project explores the use of protonated or activated biotic layers / semi-permeable membrane made from fruit peels waste (FPW) to reduce toxic froth from urban lakes in Bengaluru. The main pollutants are fluorides, nitrates and effluents of phosphorous released with the untreated sewage water from the industries and domestic buildings surrounding the water bodies.

This is the first organic or biotic method of removal of these froth causing agents in lake water. It is much cheaper than the available methods which are chemical based and are non-economic.

Features

- The activated semi-permeable biotic membrane is made of acidified watermelon, banana, pineapple and citrus peels. These are low-cost alternatives for removing the frothing agents in lake
- The adsorbent is activated using acid which makes the process spontaneous.
- Fruit peel wastes are treated with mild acid to increase their efficiency so that they adsorb at a faster and countable rate

Conventional fertilizer sprayers have certain drawbacks. The user comes in direct contact with the fertilizers and ends up carrying heavy load — both of which require excessive manual effort, not to mention the time consuming process. In the backpack-type pesticide sprayer model, user needs to carry the heavy tanker on the back, oscillate the leveller and hold the nozzle when spraying the pesticides. The team has developed a semi-automated pesticide spraying machine, which has an edge over the current models

Features

- The equipment is customised specifically for farmers owning 5 to 6 acres
- It is suitable for spraying at minimum cost
- The rotary motion of the pinion is converted into reciprocating motion by single slider crank mechanism. Due to this arrangement, the connecting rod moves upward and downward, which then reciprocates the piston of single acting reciprocating pump that is mounted at the top of the storage tank. During the forward motion of the connecting rod the pesticide is thrown into the pump and during the downward motion of the connecting rod, the pesticide is forced through the nozzles
- The mounted solar panel can also be used to spray pesticides, and store energy in a battery for future use

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PROJECT
SEMI-AUTOMATED PESTICIDE SPRAYING MACHINE

Puneeth M Y
ME

Purushotham M
ME

55
PROJECT
WATER WHEEL PUMP

Santhosh Kumar L
ME

Rahul M R
ME

Agriculture is the backbone of modern India. Problems with power supply affect the yield, as pumps used to supply water to the fields requires continuous supply of fuel and electricity. Exploring alternatives during research led to the development of a spiral tube **Water Wheel Pump,** an effective method for pumping water without the use of any conventional sources of power. The energy flow is converted to kinetic energy, which in turn transfers water. The discharge of water depends on the capacity of the pump. This makes it an eco-friendly method to supply water and it can be used at different locations.

A typical Minimoto is approximately one-quarter the size of a regular motorcycle, and is powered by a two-stroke internal combustion engine of between 40-50 cc producing somewhere between 2.4 and 1.7HP (1.8 and 11KW). These look like sport bikes and are used in pocket bike racing on kart racing tracks. The usual height is less than 50 cm (20 in), and up to 1 m (3 ft 3 in) length. Power usually comes from a 39–50 cc (2.4–3.1 cu in) two-stroke engine with a maximum of 4.5–6 horsepower (3.4–4.5 kW). Maximum speed varies between 30 to 64 km/h (19 to 40 mph). Pocket bikes are also made in both four-stroke gasoline and electric versions. The four-stroke models are usually 110cc automatic or manual engines, and are referred to as Super Pocket Bikes. Common Super Pocket Bike models include the X7, X15, X18, X19, and X22.

56
PROJECT
POCKET BIKE

Saran
ME

Sharath
ME

Nikhil
ME

Samarjeet S Yadav
ME

Vandan R
ME

57

PROJECT

BOCO.AID: BONE CONDUCTION-BASED HEARING AID FOR PARTIAL HEARING LOSS

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Rakshanda
ECE

Hearing aids currently available in the market is based on the principle of sound amplification and transmission through the ear canal. This project offers a better alternative using bone conduction technology to aid hearing. Bone conduction is the vibration of the basilar membrane in response to a pressure difference on either side of the membrane. The propagated wave that characterises this vibration of the basilar membrane can be initialised intentionally, when a bone vibrator is placed on the mastoid bone, or inadvertently when testing hearing of one ear by air conduction, while disregarding transmission of the sound to the other side. This is one of the most reliable ways of helping partial hearing loss. This principle is also very easy to adhere to as the working and implementation is simple yet effective in its own right.

Features

- BoCo.AID tackles the stigma of wearing ear implants. Implants cause both discomfort and infections in the ear. This clip and go design keeps the user from feeling any sort of discomfort.
- The BoCo.AID can be made for unilateral and bilateral hearing loss, making it more diverse and flexible basis the user's requirement.
- This device has the potential to open up a wide spectrum of hearing solutions in future as bone conduction is still a relatively new addition to hearing solutions

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PROJECT

PIEZOPAVE: ILLUMINATE PATHS AS YOU MOVE

The aim of the current generation is to provide the world a future devoid of power cuts and a suitable environment. Piezopave is an eco-friendly project which serves this purpose and helps provide electrical energy by means of a piezoelectric transducer which converts pressure energy to electrical energy. It makes use of human foot pressure and converts the foot pressure into electricity used to light the walkways/pavements.

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EEE

Sheryl Stacey A
EEE

59

PROJECT

ENERGIEA SOLARE: HARNESSING THE SUN'S POWER

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Abhishek Kumar
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Pavan Kumar AJ
EEE

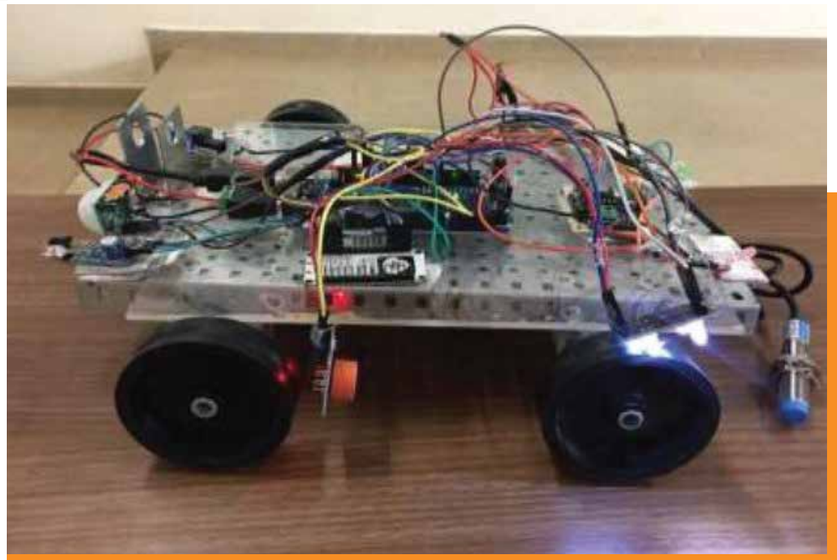
Jagadeesan
EEE

"Energiea Solare" is based on generating electricity from solar. Much has already been said about solar being the best replacement for thermal or any other form of energy generation process. This project model includes Solar Tracker and Wireless Transmission. When the sunlight falls perpendicular to the surface to the solar panel it generates maximum power compared to other angles of sunlight. The Solar Tracker helps achieve this, thus making the panel more efficient. Wireless transmission transmits electricity in medium without wiring. This process reduces complexity and also the wear and tear of the wire. With this set-up, at present, wireless mobile charging is possible.

Inspired by the chameleon, the colour-changing Camouflage Robot saves human lives as well as damages that occur during disasters. Built to avoid detection by the human eye, this robot could act as a substitute of soldiers in war zones.

Features

- The robot consists of a vehicle mounted with two cameras. One camera captures the image. The colour of the surrounding will be detected at the backend and according to that, the robot changes its colour. Another camera is used for surveillance.
- ZigBee transceiver increases the range of communication between transmitter and receiver
- The robot can quietly enter into enemy area and send information via camera to the controller. The movement of the robot is wirelessly controlled via PC or laptop
- The camouflage robot can also be used in star hotels, shopping malls, jewellery showrooms, operation aids, and rescue crews during disasters or any place that faces threats from intruders or terrorists
- It can be used to test the various security systems in the market & can evaluate their efficiency



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PROJECT

CAMOUFLAGE ROBOT – A COLOUR CHANGING SPY ROBOT

VARUN A
ISE

61 PROJECT

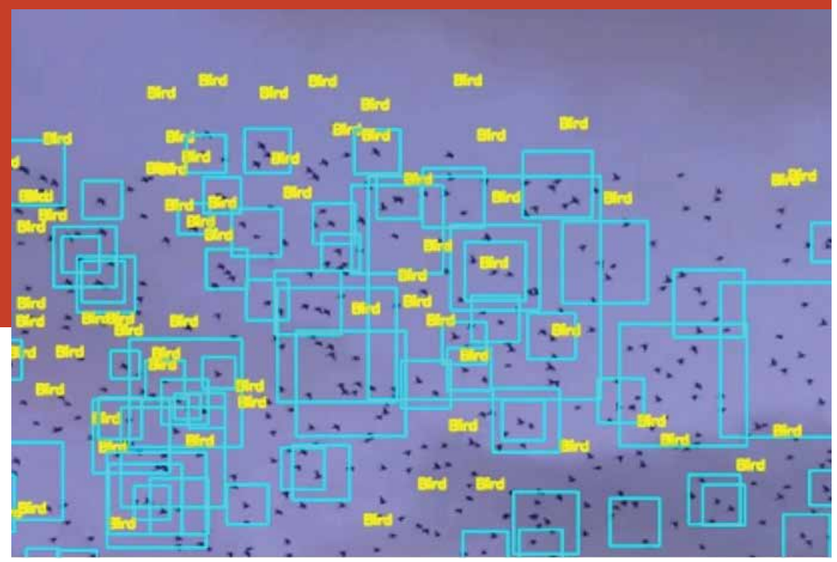
BIRD COLLISION AVOIDANCE SYSTEM ON AIRCRAFT (BCAS)

Lakshayalnani
CSE

Madhukiran K
CSE

Kartik D Pandit
CSE

Kumar Himanshu
CSE



Airplanes are powered, fixed-wing aircraft propelled forward by thrust from a jet engine, propeller or rocket engine. When risk is measured by deaths per passenger kilometer, air travel is approximately 10 times safer than travel by bus or rail. The industry is constantly developing technologies and mehanisms to reduce the dangers of air travel, which may be caused due to engine failure, bird strike, turbulence, and thunderstorms.

A bird strike or Bird Aircraft Strike Hazard (BASH) are a significant threat to flight safety, and have caused a number of accidents with human casualties. There are over 4,000 bird strikes annually in India alone. Majority of bird strikes (~65%) cause little damage to the aircraft; however, the collision is usually fatal to the bird(s). Most accidents occur when a bird collides with the windscreen or is sucked into the engines of the mechanical aircraft. These cause annual damages that have been estimated at INR 25 crores within India and up to USD 1.2 billion worldwide. In addition to property damage, collisions between man-made structures and conveyances and bird is a contributing factor, among many others, to the worldwide decline of many avian species. A Bird Collision Avoidance System (BCAS) can be developed and implemented on an aircraft to prevent the bird strike.

Features

- The system automatically detects and recognises birds and deflect or cause deterrence in birds.
- Consists of stereo camera. Once an object is detected, it is analysed by a software, a proprietary sound signal like ultrasonic sound signal is used to deviate the bird

Health issues that last more than 3 months are referred to as chronic diseases. As a person ages, risks of chronic diseases rise. The leading chronic diseases in developed countries include arthritis, heart attacks, stroke and oral health problems. In an effort to improve standards of living, researchers are testing the feasibility of implementing predicting machine learning algorithms.

Advanced ensemble machine learning algorithms are new to this field of study. The proposed system explores multiple advanced ensemble machine learning algorithms (such as the Gradient Descent Boosting Algorithm) and tries to predict the occurrence of the chronic disease. The models were validated across different datasets to ensure highest accuracy.

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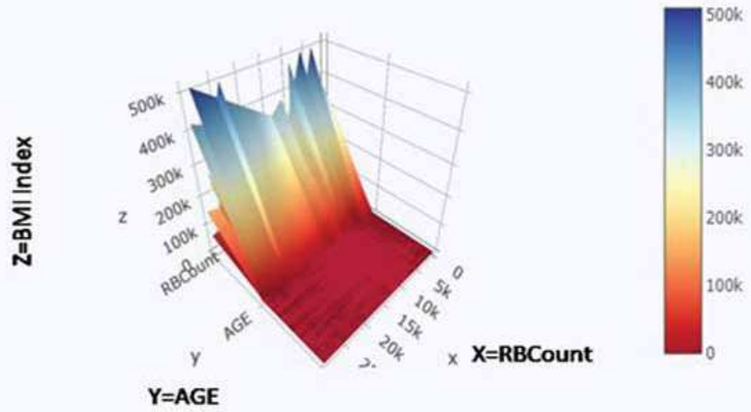


Shridevi
CSE

62 PROJECT

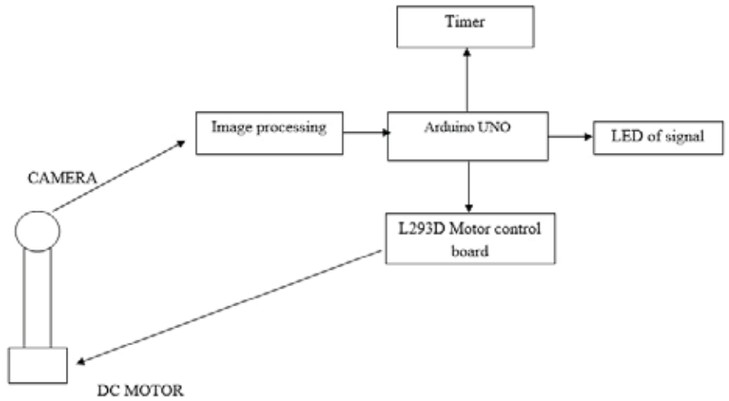
FORECASTING CHRONIC DISEASE OF PATIENTS USING COMPUTERISED HEALTH RECORDS

63

PROJECT

SMART TRANSPORTATION SYSTEM USING IMAGE PROCESSING

Rakesh N
ECE



With the increase in urbanisation, there has been a spike in the number of vehicles on the road, causing traffic jams. The unorganised traffic signals only add to the woes. Traffic jams are controlled either manually or through a timer. The disadvantages of both these systems are that they are not efficient in real-time. The proposed solution addresses the issues through a video processing-based, automated traffic signal management system in real-time.

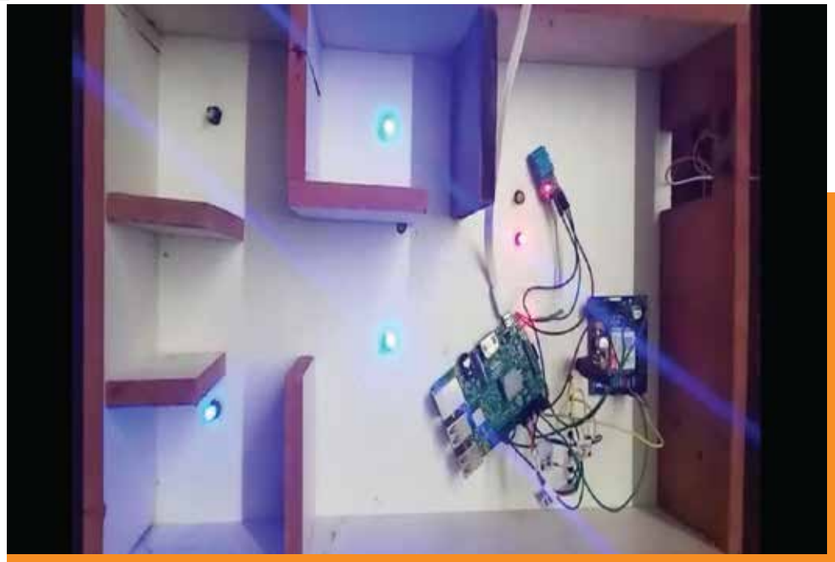
Features

- Implemented using MATLAB and Simulink software
- Use of image processing technique: First, the film of a lane is captured by a camera. A web camera placed in the traffic lane captures images of the road. These images are efficiently processed to calculate traffic density. According to the processed data, the controller command traffic LEDs to show particular time on the signal, thus efficiently managing traffic.

This project presents the overall design of Home Automation System (HAS) with low cost and wireless system. This system is designed to assist and provide support in order to fulfil the needs of the elderly and the disabled at home. Also, the smart home concept in the system improves the standard of living at home.

Features

- The switch mode and voice mode are used to control home appliances
- The video feedback is received in the android application which streams the video captured by the camera
- The main control system implements wireless technology to provide remote access from the phone. The status of switches is synchronised in all the control system whereby every user interface indicates the real time existing switches status
- The system is designed to provide offline access through GSM modem
- All the appliances can be controlled with the help of an SMS. This makes the system much more secure and reliable
- The system is intended to control electrical appliances and devices in the house with relatively low-cost design, user-friendly interface and easy installation



64

PROJECT

LIVING THE SMART LIFE THROUGH HAS (HOME AUTOMATED SYSTEMS)

Nagendra N S
CSE

Manoj K R
CSE

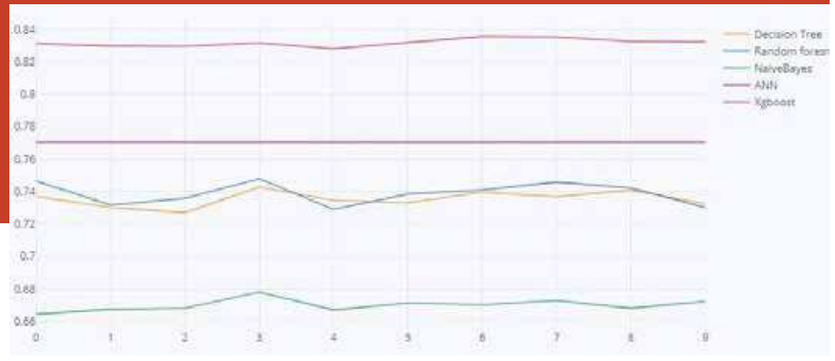
Nithin Kumar
CSE

65

PROJECT

ONLINE SOCIAL NETWORK

Rajeshwari P N
CSE



Online Social Network (OSN) can be used to connect people across the world. Facebook is the biggest OSN and is addictive to many users. Its clients use it for exchanging messages, pictures and statuses. Connections between users on Facebook are represented through the concept of friendship. Good relationship among the clients in a communal system plays an important role when trying to frame a social network.

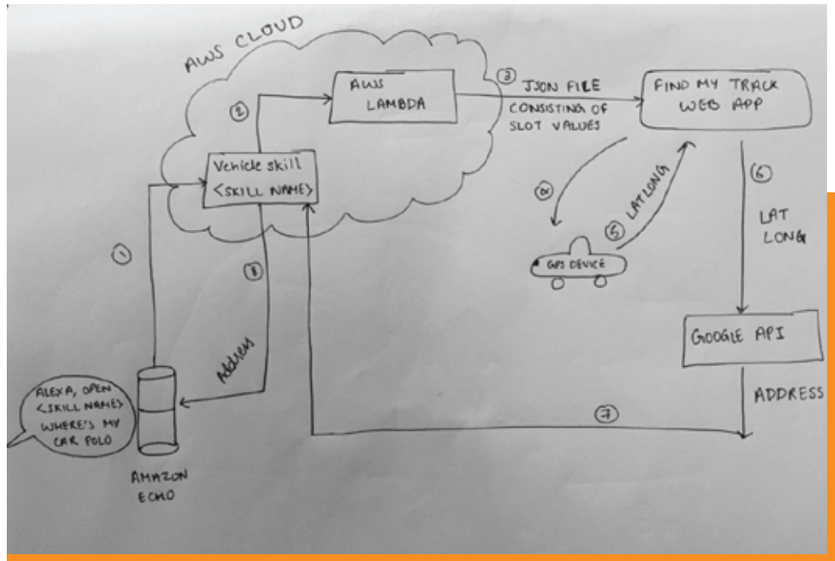
The goal of this proposed system is to predict toxic (suspicious) and nontoxic friends of OSN by using an ensemble of machine learning algorithms Currently, most of the existing business improvement methods are based on social networks of user interests. So, to improve the business strategies, this system will classify ego-user's network friends into 3 clusters -- high active, medium active and low active friends. The system predicts suspicious and non-suspicious friends in each cluster based on interaction statistics. This proposed system introduces new algorithms -- XGBoost and ANN method to achieve higher accuracy than existing algorithms -- Random Forest, Decision tree and Naïve Bayes. It also suggests the best approach for conducting this type of research on similar OSN communication data.

66

PROJECT

TRACKING CAR LOCATION USING AMAZON ALEXA

Locating a car on busy city streets just got a little easier. This project enables a user to locate their car by just asking Amazon's virtual assistant, Alexa, its whereabouts. Alexa passes the name of the car as specified by the user to web application "Find my Track", which finds the coordinates (latitude, longitude and other details) of the car's location from the GPS device attached to it. These details are then sent to Google API, where the address of the car's location is obtained from the coordinates through reverse geocoding. This address is then sent to Alexa, which in turn is conveyed to the user.



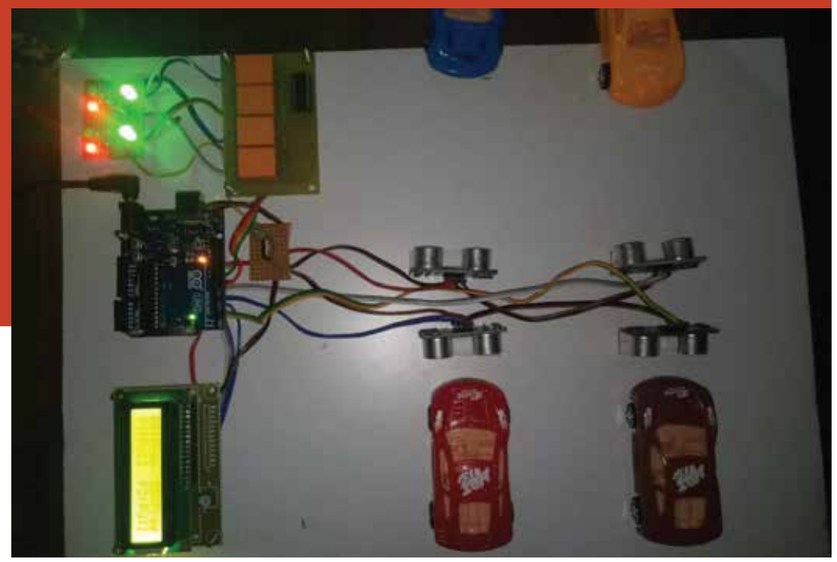
Manvi Grover
CSE

67

PROJECT

SMARTER AND HASSLE FREE PARKING SYSTEM

Yashaswini D M
CSE



Parking is a growing challenge in most metropolitan areas, especially during peak hours. The root of the difficulty lies in not knowing which parking spaces are available at a given time, leading to serious traffic congestion and fuel wastage.

This project presents a smart parking system which provides a solution, in which the status of each and every parking slot will be visible to the user as soon as they enter the parking lot. It uses an HC-SR04 ultrasonic sensor, 16*2 LCD display and LED (green and red) to indicate which lots have available space. The HC-SR04 ultrasonic sensor is installed in each parking slot area. The sensor will detect the parking slot already used by a car. The data obtained from the ultrasonic sensor will be managed by Arduinouno, which sends the sensor information to 16*2 LCD display to show the status (free or full) in the entrance. If a slot is free a green LED glows, if not red LED glows.

68

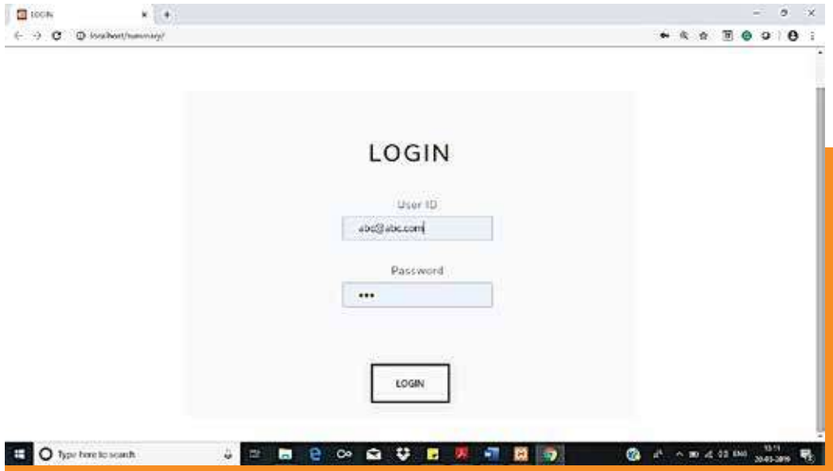
PROJECT

THEME DESIGNING FOR TEXT DOCUMENT USING WEIGHTED ALGORITHMS

Shilpa
CSE

A theme provides brief information about a document. Effective and efficient theme extraction can help users sift through the documents with ease, given the context of information explosion in recent times. There are two ways to design a theme for a document: Abstractive approach and Extractive approach. Abstractive summary approach gathers information by inferring the content and building the new summary. Extractive summary methods identify the important topics for a given document, and design the theme using sentences from the topics identified without altering the original text.

In Clustering Algorithms-based methods, the text is organised in groups. In Lexical Chains-based approach, the semantic relationship between words computed is used to find cohesive links and the sentences with higher links are used to build the theme for the document. But in these approaches the anaphora problem still persists. The proposed method uses synthesis of weighted algorithms LDA and PLSI and overcomes the anaphora problem and generates summary that is more coherent.



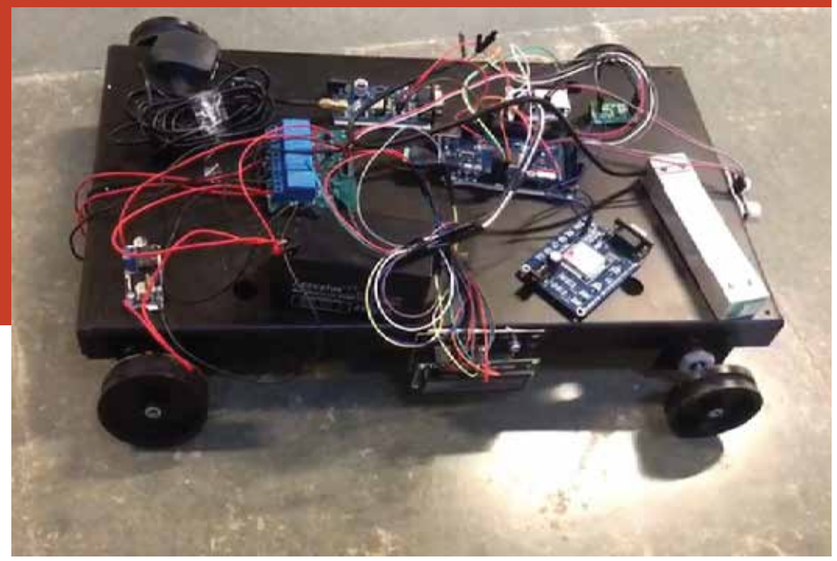
69
PROJECT
TRAVELMATE: SELF-DRIVEN ROBO WHICH FOLLOWS YOU

Ritika Iyer
CSE

Meenakshi Poddar
CSE

Mishael J Aradhana
CSE

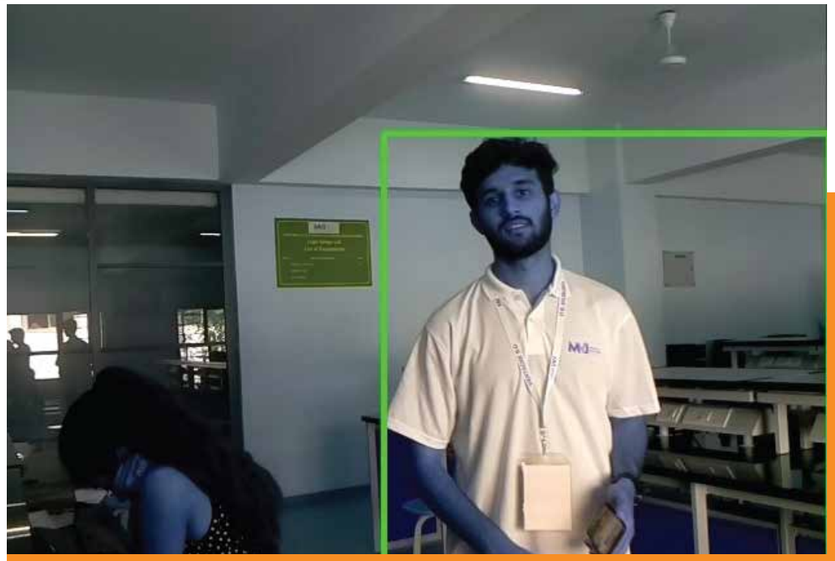
Saurabh Behra
CSE



Suitcases are an essential commodities while going on a trip, and their safety remains a concern. Chains and padlocks are outdated, and a number-based lock can be easily hacked.

This project creates a smart suitcase with increased security for the suitcase as well as the user, thus enhancing the travel experience. What makes our suitcase smart is the automatic following feature. Travellers no longer have to drag their heavy luggage around. These smart suitcases simply follow them around. The technology used is CNN with location tracking and luggage weight monitoring.

Automation is changing the ways of the world, but some systems are still dependent on human factors. The security system is a fine example. In today's world, security is becoming a key issue especially in places like museums, defence areas etc. The aim of this innovation is providing the required automation in security systems through IoT. IoT provides better connectivity of devices and systems, easily collects and analyses data and delivers accurate output. The team has designed the solution through a combination of hardware and dedicated software that helps create real-time security system.



70
PROJECT
IOT BASED SMART CAMERA

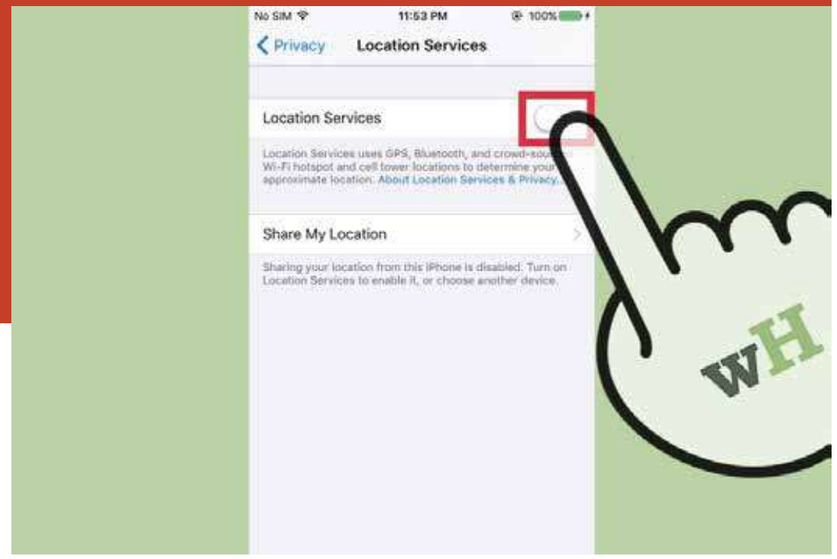
Tarun Tiwari
ECE

Ankita Singh S
CSE

Anusha A Reddy
CSE

Apoorva N
CSE

71
PROJECT
BLOCK SHARE



Growth in blockchain technology has resulted in the development of bitcoins and another important application called ‘Story’, which involves the concept of a distributed cloud storage. A more efficient application would be to enable file-sharing through the Blockchain. This would help in reducing the two-step process of uploading a file to the drive and downloading it to a single step process of just transferring it from a sender to a receiver in a Blockchain network. Even though there are several applications which provide file sharing, they cannot match the security guaranteed by Blockchain technology. This project focuses on enabling a secured file sharing application using a private Blockchain network so that it can be used within small organisations. A greater level of security is achieved by applying some critical algorithms from cryptography to strongly encrypt the file, thereby making sure that none other than the receiver can gain access to the file.

The road power generator is a concept that revolutionises the concept of speed breakers. It implements the concept of electric power generation from the principle of electromagnetism. The set up consists of a speed breaker hump, which is connected to a pinion through a rack (rack and pinion arrangement) below the hump. A shaft S1 is connected to the pinion which has a sprocket connected to one of its ends, another shaft S2 is placed parallel to this shaft. S2 has a sprocket with lower diameter as compared to the sprocket on S1. Shaft S2 is driven by chain drive. Due to a lower gear ratio, the speed on S2 is multiplied. The other end of S2 is connected to a generator which generates electrical power every time the shaft S2 rotates. A flywheel on S2 helps to increase moment of inertia of the shaft, rotational speed of S2 is further multiplied using a gear arrangement having low gear ratio before being connected to the shaft of the generator. The energy can be stored in a capacitor or a battery and can be used to light street lights and traffic signals.

72
PROJECT
ROAD POWER GENERATOR

Aylwin Pierre
ME

Johnson Gokul V
ME

Madhuri
ME

73

PROJECT

HIGHWAY WINDMILL: CLEAN ENERGY, IMPROVED LIVES

Nikitha B
ME

This project aims to extract wind and solar energy in the most efficient manner with multi-fold impact. Small vertical axis wind turbines are installed on the road dividers so that wind flow from both sides of the highway acts tangentially in opposite directions on both sides of the turbine. These types of turbines can be installed on express highways and other high-speed traffic areas to generate electricity. In this, wind energy is converted to mechanical energy which in turn is converted to electrical energy. Solar panels installed near these windmills also add to the power reserve.

The lack of clean drinking water is a problem that plagues many nations in the world today. Long-term storage of water in plastic bottles lead to BPA adulteration. Most of the current technologies available to combat this problem are expensive and consume too much power. The use of chemical processing mechanisms for purification is an affordable solution, but it has been known to be hazardous if used improperly.

With the idea of low cost and sustainability in mind, the team has developed a water filtration system that uses natural energy to power the purification system.

Features

- The filtration system: Water flows through 3 carbon filters, a high-pressure pump, RO system, and a UV purifier of 11 watts and also has UV-fail alarms
- Photovoltaic technology is used to charge a battery back-up system
- Filteration system requires a power input of 12V, which is given either by solar battery or car battery
- The unused water is redirected to windshield wiper reservoir in cars and a separate reservoir in bikes

74

PROJECT

PORTABLE RO PURIFIER

Dheemanth K P
EEE

Harsha A
EEE

Vishwanath S N
EEE

Sudarshan H S
EEE

75 PROJECT

MULTI-PURPOSE MACHINE IN PRODUCTION UNITS

Pradeep Kumar S
Diploma in ME

Hitesh L
Diploma in ME

Jeshwanthsiddu S
Diploma in ME

Chandangowda B N
Diploma in ME

This project explores the concept of **Multi-Purpose Operating Machine** in production-based industries. Today, every task can be completed much faster due to technological advancement. But this advancement also demands huge investments. Production industries aim to achieve high productivity rate at low average costs, while maintaining the quality and standard of the product.

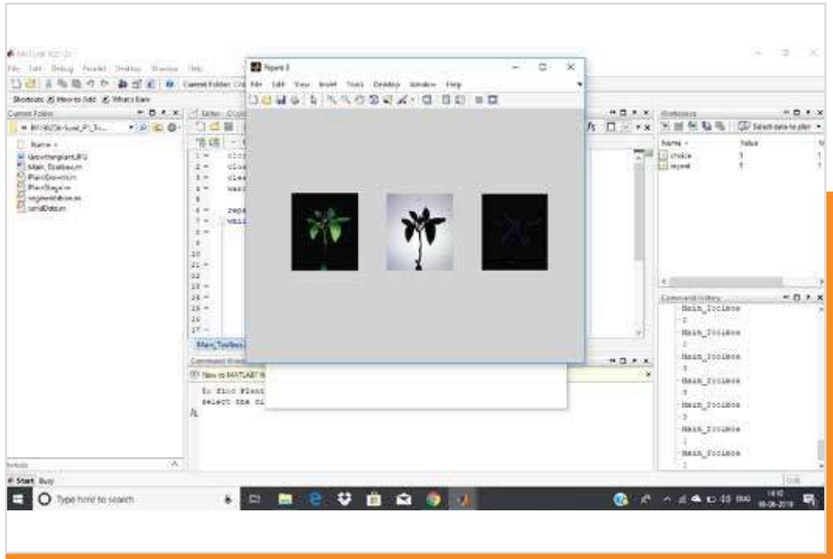
This project has developed a conceptual model of a machine capable of performing different operations simultaneously, economically and efficiently. In this machine, the drive is attached to the main shaft, which in turn is directly connected to the scotch yoke mechanism (used for sawing operation). On the main shaft, a bevel gear system transmits power at two locations and drives the drilling and grinding centres. The model facilitates operational performance at different working centres simultaneously with a single power source.

Objectives of this model are conservation of electricity, reduction in cost associated with power usage, increase in productivity, reduced floorspace.

The Internet of Things is a network of physical devices (electronics, software, sensors and connectivity — including vehicles, building and other objects) which enable collection and exchange of data.

Today, IoT is remodelling farming, allowing farmers to use a wide range of techniques to gather information regarding conditions such as weather, humidity, soil temperature and fertility. Crop monitoring enables detection of various crop stages (germination, flowering, fruiting) using image processing technique. Farm conditions are monitored by wireless sensor networks and micro controllers are used to control and automate.

The proposed system monitors crop fields using sensors (moisture from soil, temperature, humidity, light conditions) during germination, flowering, fruiting stages. Automated irrigation system snaps into action when the field's humidity falls below a pre-set value. This is done through wireless transmission and the sensor data is sent to web server database. In the image processing section, the image is initially taken from the camera and further processed by "K means clustering" for the image segmentation.



76 PROJECT

IOT BASED CROP MONITORING SYSTEM

Suchith B R
ECE

Uday Kumar G
ECE

77

PROJECT

SMART SHELVES FOR RETAIL PLATFORM

Abhilash S
ECE

Akhilesh S
ECE

Akshaya P
ECE

Pervasive computing uses embedding microprocessors in everyday objects to communicate information. With the advancements in IoT, a new trend in the era of ubiquity is being realised.

'Out of stock' is a great concern for the Consumer-Packaged Goods (CPG) and Retail Organisations. This paper describes how the racks/shelves at the retail store can be made smarter to raise alerts, keep track and set reminders. Utilising sensor and smartphone technology, an embedded processor in the shelves interacts with the user and automatically generates a to-buy list and sends alerts basis the requirement.

Features

- A simple user interface is used in the system and the hardware consists of Raspberry pi3, load cell, HX711 Amplifier and RFID
- The device connects to the cloud and keeps the retailer updated of all commodities in the shop.

The alert notification can also be given through the SMS when there's a particular need of any commodity

Fishes are coldblooded creatures. Their development depends intently on the natural circumstances. Water quality – determined through parameters like water level, turbidity, pH, temperature, salt, nitrates, carbonates – is a basic factor. But monitoring the fishpond can be quite challenging.

LabVIEW interfaced fishpond checking framework is structured utilising Arduino Mega to observe water level, temperature and time to guarantee development and survival of amphibian life. The Arduino board is interfaced to the LabVIEW LINX with all sensors. The nature of water is observed continuously. The detected information is communicated to the farmer through the cloud. Therefore, preventive measures can be taken and misfortunes can be avoided.

78

PROJECT

LABVIEW INTERFACED PISCICULTURE MONITORING SYSTEM

Navyashree S
ECE

Nithya Lakshmi S
ECE

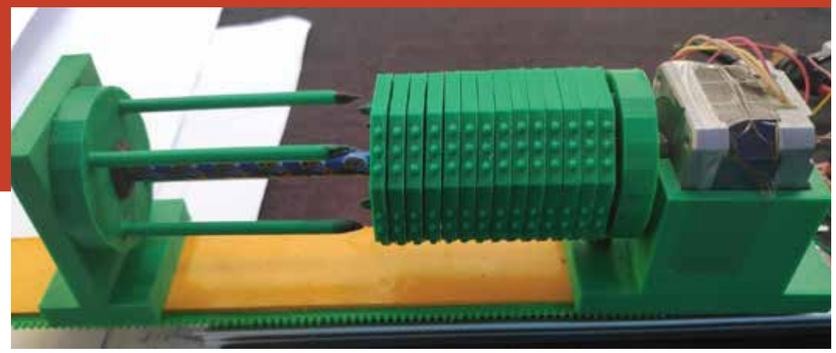
79

PROJECT

SMART BRAILLE PAD FOR THE VISUALLY IMPAIRED

Abhishek Sarkar
ECE

Harshith P N
ECE



Braille Pad is a device which displays the text information using the symbols of the Braille. In the modern era of digital communication, it is important for a person to be able to access this facility and make use of it. Visually impaired have been left behind in this revolution.

This project is a low-cost Braille pad to enable the visually impaired and enhance their reading experience. With this pad, they can read text from their personal computer, laptop or smartphone by means of tactical touch sense.

Features

- Braille pad is formed by octagonal rings consisting of braille dots that displays the required alphabet.

GPS navigation apps have proven to be lifesavers. With a GPS enabled system in hand, it is easy to find your way to a destination, even in an unfamiliar city. However, it is still easy to get lost indoors, where GPS satellite signals are not accurately traceable by the navigation system.

Indoor navigation deals with navigation within the buildings. Contrary to GPS, however, they also enable you to determine the actual floor level. It includes an indoor routing functionality that automatically detects their exact position and guides people precisely through a building.

Alexa based navigation system provides low-cost, user friendly indoor navigation services. The user can easily find the correct path to their destinations by simply following the instructions from Alexa.

Features

- This system is powered using Amazon Echo, Amazon's cloud services and its speech services.
- Raspberry pi, RF Transmitter, RF Receiver are the hardware components

80

PROJECT

ALEXA BASED INDOOR NAVIGATION SYSTEM

Anusha C
ECE

Chandana S
ECE

Deepa K N
ECE

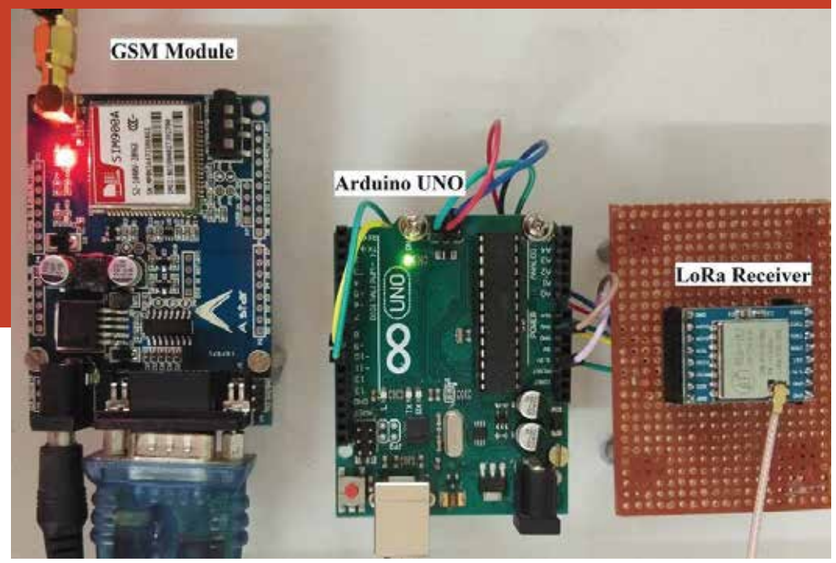
Kavya H R
ECE

Nagashree Y A
ECE

S Balaji
ECE

Manohar
ECE

Rachana N
ECE



81
PROJECT
LORA ENABLED REMOTE LOCATION SAFETY MONITORING SYSTEM

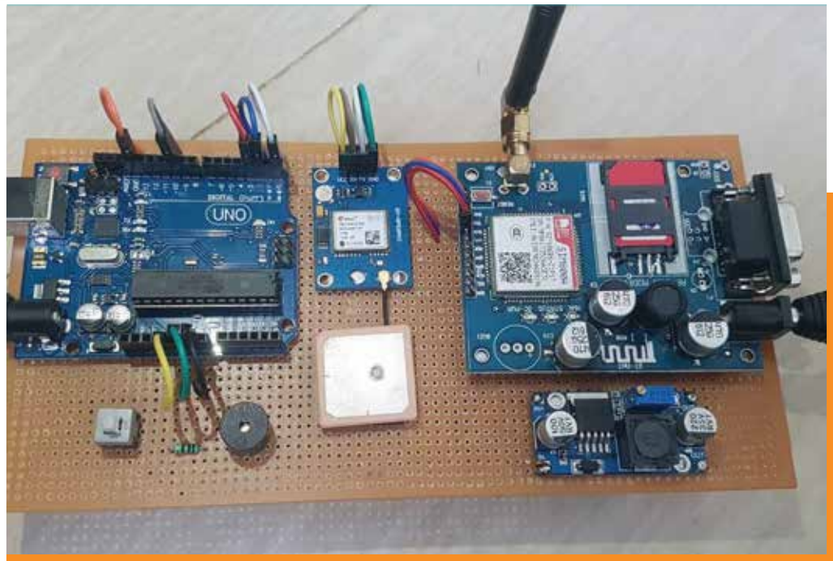
The objective of this project is to design, implement and monitor safety parameters at home, shopping stores, industrial areas or any confined remote area. This project will constantly monitor environment conditions and transmit their values to the fire-station, police-station, hospital and emergency services.

The system constantly monitors different predefined parameters set by the user. When the monitored parameter is out of prescribed limit, an alarm goes off and an SMS will be sent to all the concerned departments or neighbours.

Features

- Designed using LoRa technology with .Net and Web Technology.
- Modular and can be expanded to include additional users.
- The system can communicate long distances (i.e. 10KM)

Images taken on cameras and mobile phones provide information like date and time of the photo. But we cannot detect the exact place or location where the image was taken. Some devices with high-end technology support geo-tagging. We can retrieve latitude and longitude coordinates, name of the destination, distance, time and other information. By using geotagged information, it is possible to know the exact location of the image. The GPS coordinates are fed into the search engine to map the location.

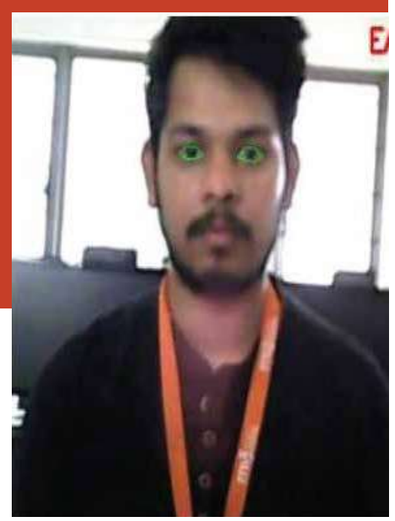


82
PROJECT
GEO-TAG AND ALERT SYSTEM

Abhijith Rohan R
ECE

Sivaraman K
ECE

Ajay Kumar C
ISE



83

PROJECT

DRIVER DROWSINESS AND ALCOHOL INTOXICATION DETECTION AND BLIND CURVES ACCIDE PREVEN USING RASPBE

Drowsiness and drunk driving are the main causes of road accidents. This paper proposes a real-time detection of driver's drowsiness as well as alcohol intoxication level and subsequently alerting them. The main aim of this proposed system is to increase the transportation safety

B camera, sensor

nd issues a

rduino Uno. This will

DH
DECCAN HERALD

Students develop black box for cars

SANJANA S MEGALAMANE
TEAM METROLIFE

(From left) Kevin Pius, Tamal Dey, Bikram Nath and Dhruv Kumar.

WALLET FACTOR
Black Box is expected to be priced between Rs 10,000 and 15,000, and the team is looking for funding to launch it commercially.

Four students have developed an app to send out alerts in case of road accidents. Called Black Box, it works with a hardware device installed under the seat.

Dhruv Vekariya, Kevin Pius, Tamal Dey and Bikram Nath, all students of MVJ College of Engineering, spent about a year on this project. The app sends out messages to the police control room, ambulance service, and close family members.

The Black Box

"One of my uncles met with an accident and his leg got stuck under the dashboard. Because of the long wait for an ambulance, he developed blood clots and was paralysed from the hip down. This is what pushed me to work on the app," Dhruv told *Metrolife*.

High-profile cars and aircraft already have black boxes, but they are expensive. The team wanted to develop an affordable version, says Kevin.

How it works
Black Box automatically connects to the Wi-Fi or hotspot as you enter a car. Variations in the accelerometer reading are used to detect a crash and send alerts to numbers listed on the app.

The aim is to design and develop an air brake system based on exhaust gas to reduce the workloads of the engine drive to operate the air compressor. In this project, the compressor is not operated by the engine drive. Instead, a turbine is placed in the path of the exhaust from the engine. The turbine is connected to a dynamo by means of coupling, which is used to generate power. Depending upon the airflow the turbine starts rotating, and then the dynamo also starts to rotate and converts kinetic energy into electrical energy. The generated power can be stored in the battery and can be used to load the D.C compressor. The air compressor compresses the atmospheric air and stores it in the air tank, which has a pressure relief valve to control the pressure in the tank. The air tank supplies the compressed pneumatic power to the pneumatic actuator through solenoid valve to apply brake. The pneumatic actuator is a double acting cylinder which converts hydraulic energy into linear motion.

84

PROJECT

AIR BRAKE SYSTEM USING EXHAUST GAS

Gopala Krishna P V
Diploma in ME

Gautham M
Diploma in ME

Medhavin S
Diploma in ME

Nithin G
Diploma in ME

85
PROJECT
MECHANICALLY OPERATED PESTICIDE SPRAYING MACHINE

Punithkumar M
ME

Praveen Kumar S
ME

Panjunath R
ME

In agriculture, sprayer is a piece of equipment that is used to spray pesticides in the fields. Conventional spraying technique uses hand-operated power sprayers with backpack. The area per hour covered with these types of devices is low. Some sprayers also require petrol or diesel as a fuel. Labour cost for this system is also high. Some devices cannot even be rotated 360 deg.

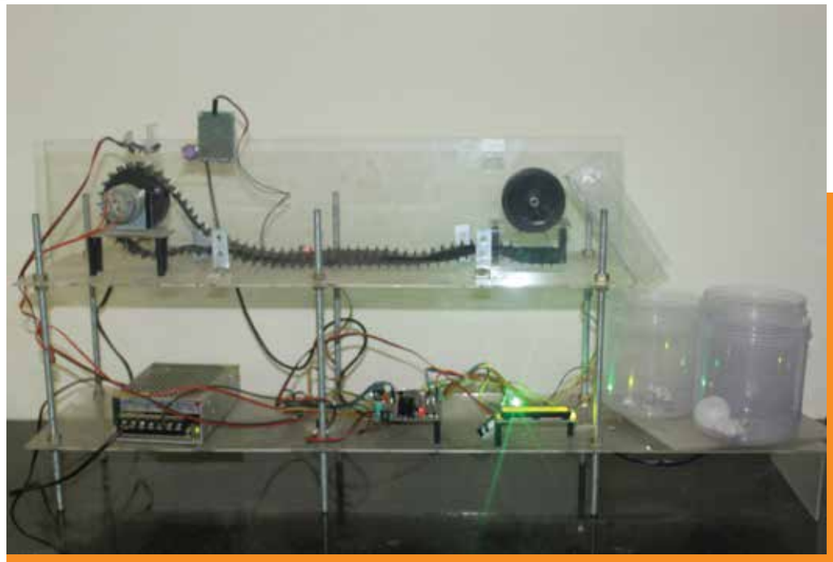
To overcome these problems, the proposed work deals with the design and fabrication of pesticide series sprayer with the feature of 360 deg. pipe rotation and adjustable pipe length. The model was designed by using CATIA and fabrication was carried out by different techniques. Real-time testing was carried out at different fields.

Garbage disposal is a growing concern across the world. The most common method of waste disposal is unplanned and uncontrolled open dumping at the landfill sites, which is injurious to human health, plant and animal life. It generates liquid leachate which contaminates surface and ground water. It can harbor disease vectors, which spread harmful diseases and can degrade the aesthetic value of the natural environment. Not to mention it is an unavailing use of land resources.

In India, rag pickers play an important role in the recycling of urban solid waste. Due to the inhuman working conditions, rag pickers and conservancy staff have higher morbidity. They suffer from infections to the skin, respiratory, gastrointestinal tract and multisystem allergic disorders. They're at risk for bites of rodents, dogs and other vermin.

When the waste is segregated at the source, it has a higher potential of recovery. The wet waste is converted into compost or methane-gas or both. The metallic waste could be reused or recycled.

This smart dustbin is a cheap, easy to use solution for a segregation system at households, so that it can be sent directly for processing. It is designed to sort the refuse into metallic waste, wet waste and dry waste.



86
PROJECT
WASTE SEGREGATION USING SMART DUSTBIN

Sagar S
ME

Sameer Ahmed
ME

Saqib Ahamed
ME

Shadab Khan
ME

APPENDIX

Research and Development

Areas of research include:

- Electrophoretic deposition of epoxy nano-composites (DRDO)
- Effect of corrosion on the concrete infrastructure and its durability (VGST)
- Experimental studies on complex swept rotor blades (DRDO-ARDB)
- Investigation of effects and hazards of wind flow on buildings in multiple arrangements using CFD (VTU)
- Application of biotechnology & insect aerodynamics in micro aerial vehicle (CSIR)
- Preparation, characterisation and gas sensing studies of nanometal oxides (VGST-YSR)
- Nano-engineered photocatalyst for hydrogen production from water (VGST)
- Design of a compressor module for a small gas turbine engine (DRDO)

Patents

a. **Provisional patent numbered 1967/CHE/2015 dated 16-04-2015 was filed by Amardeep A**, Asst. Professor, AE, MVJCE and Hamid Isakhani, VIII Sem, AE, MVJCE for the project **"AN IMPROVED INFRARED THERMAL IMAGING MICRO UNMANNED AERIAL VEHICLE FOR RESCUE OPERATION".**

b. Provisional patent numbered 1968/CHE/2015 dated 16-04-2015 was filed by KRISHNAN KUMAR of PROFESSOR, DEPARTMENT OF CIVIL ENGINEERING, MVJCE, for the project **"AN IMPROVED REFERENCE ELECTRODE USEFUL FOR MEASURING OPEN CIRCUIT POTENTIAL (OCP) OF STEEL IN CONCRETE INFRASTRUCTURE".**

c. Provisional patent numbered 1969/CHE/2015 dated 16-04-2015 was filed by KRISHNAN KUMAR of PROFESSOR, DEPARTMENT OF CIVIL ENGINEERING, M V J COLLEGE OF ENGINEERING relating to project **"AN IMPROVED FORMULATION FOR HYDROPHOBIC AGENT BASED ON CARBON NANO COMPOSITE USEFUL AS AN ADDITIVE TO PROTECTIVE COATINGS".**

d. Provisional patent numbered 1970/CHE/2015 dated 16-04-2015 was filed by KRISHNAN KUMAR of PROFESSOR, DEPARTMENT OF CIVIL ENGINEERING, M V J COLLEGE OF ENGINEERING relating to project **"AN IMPROVED BLOOD CELL ANALYZER USEFUL FOR MEDICAL DIAGNOSIS".**

e. Provisional patent numbered 6344/CHE/2015 dated 26-11-2015 was filed by Mr.AMAL DEV, ASSISTANT PROFESSOR, DEPARTMENT OF MECHANICAL ENGINEERING relating to project **"EMERGENCY FUEL EVACUATION SYSTEM DURING AUTOMOBILE ACCIDENTS".**

PRESS COVERAGE

DH
DECCAN HERALD

Students develop black box for cars

SANJANA S MEGALAMANE
TEAM METROLIFE

(From left) Kevin Pius, Tamal Dey, Bikram Nath and Dhruv Kumar.

Four students have developed an app to send out alerts in case of road accidents. Called Black Box, it works with a hardware device installed under the seat.

Dhruv Vekariya, Kevin Pius, Tamal Dey and Bikram Nath, all students of MVJ College of Engineering, spent about a year on this project. The app sends out messages to the police control room, ambulance service, and close family members.

The Black Box

"One of my uncles met with an accident and his leg got stuck under the dashboard. Because of the long wait for an ambulance, he developed blood clots and was paralysed from the hip down. This is what pushed me to work on the app," Dhruv told *Metrolife*.

High-profile cars and aircraft already have black boxes, but they are expensive. The team wanted to develop an affordable version, says Kevin.

WALLET FACTOR

Black Box is expected to be priced between Rs 10,000 and 15,000, and the team is looking for funding to launch it commercially.

How it works

Black Box automatically connects to the Wi-Fi or hotspot as you enter a car. Variations in the accelerometer reading are used to detect a crash and send alerts to numbers listed on the app.

HARD AND HEARTY | These helmets made from pineapple leaves are stiffer than commercially available gear

Pining for this helmet

Rashmi Patil catches up with a group of students who have developed a helmet made from pineapple leaf fibres, for real

No matter how many policies we form or panel discussions we hold, it seems like it's become nearly impossible to put an end to plastic use. From milk packets to chairs to helmets, everything is made of plastic. This has led to an increase in pollution in landfills around the world, as every bit of plastic takes nearly five centuries to decompose. In 2019, the demand for major plastic across India was around 16 million metric tonnes. While governments of different states are moving to ban plastic, that just isn't enough as environment crusaders believe that it is imperative to come up with sustainable alternatives as well.

This group of Mechanical Engineering students from **MVJ College of Engineering** in Bengaluru understand that and they have come up with a solution to replace the plastic helmets that we use on a daily basis. **Mohammed Arifulla S, Channaveer, Manoj Kumar S** and **Karthik G**, under the guidance of Dr Sunil Waddar, have designed a helmet with pineapple leaf fibres. Yes, a pineapple helmet! Karthik says, "The COVID-19 pandemic has brought about a global crisis and India is one of the countries that has been affected quite badly by it. While the country is trying to cope with this deadly virus that poses looming dangers, we have pushed climate issues into hitherto unseen and precarious territory. Hence, we have developed a bio-composite helmet that is superior to the conventional helmet." The helmet isn't as flimsy as you might believe. The bio-composite helmet is made with pineapple leaf fibres, reinforced into an epoxy resin matrix using the hand lay technique. He further explains, "At first, the pineapple woven fabric is cut to the required dimension and weighed. The interior thermocol of the conventional helmet is used as a mould. Based on the dimensions of the fabric, the mass of epoxy needed is calculated and the woven fabrics are wetted in the matrix medium. A silicon releasing agent is applied on the mould to facilitate easy removal of the cast samples and the wetted fabrics are laid on the mould. The moulds are cured at room temperature and later removed. Post removal, the extra projections are trimmed using a hexa blade."

hard hat

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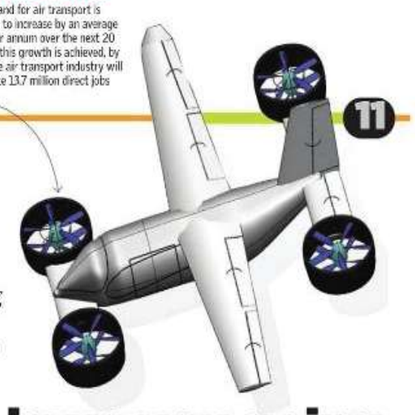
mvjce.edu.in

5G will be useful in the prediction of accurate forecasts, cloud formation, turbulence and so on, in this aircraft

Future jobs in aviation

The demand for air transport is expected to increase by an average of 3% per annum over the next 20 years. If this growth is achieved, by 2038, the air transport industry will contribute 13.7 million direct jobs

Team Abhimanyu 4.0 is gearing up to change the aviation industry with their electric vertical take-off and landing aircraft. ***Rashmi Patil*** finds out more



They'll have you going up, up and away soon

Engineering is not just about being theoretically ready, it also requires one to learn the skills and be industry ready too, believes **Keerthi GN**, an Aeronautics student at MVJ College of Engineering in Bengaluru. Recently, their project, **Inter-city Electric Vertical Take-off and Landing Aircraft** (ICeVTOLA) won them the first prize at the National Aerospace Conceptual Design Competition (NACDeC-IV). **Abhimanyu 4.0** consisting of Keerthi GN, Amruthamshu KP, Koushik Udayachandran, Mithun Francis P and Atyab Hakeem is the team behind designing the ICeVTOLA. "We started working on this project last October while discussing the designs and points virtually and we were able to present it last month," says Keerthi.

While vertical landing and take-off by an aircraft is something we've seen only in movies, so far, this is one of the first unique designs. Keerthi explains, mitigating emissions. That's where the ICeVTOLA plays an important role. It could overcome these limitations of surface transportation by enabling urban and regional aerial travel services and is a technology that could end traffic jams."

Since it is an aircraft carrying four people and a pilot, including the cargo capacity, they have designed it in a way that it can be used to connect the metros to nearby cities and provide connectivity to augment tourism and aid in the strategic travel by public agencies. Keerthi says, "Urban air mobility (UAM) is an emerging aviation market that seeks to revolutionise mobility around metropolitan areas via a safe, efficient and accessible on-demand air transportation system for passengers and cargo. The main idea behind developing this electric aircraft is to keep the future in mind. It will not only reduce the usage of diesel but also the emission of carbon footprint in comparison to conventional helicopters. We believe that the expected entry of this aircraft into the market is 2031 across all countries. But we also need 5G technology in India to roll this out." mvjce.edu.in

THE AVIATION INDUSTRY IN THE LONG, LONG RUN

The International Air Transport Association (IATA) has determined in their report that cybersecurity, robotics and automation and 3D printing will make a big impact on the aviation industry by the year 2035

in the air

SCAN THIS CODE TO READ THE STORY

The team at MVJ College of Engineering was guided by Prof R Rajasekar

2 develop device to generate real-time Braille impressions

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Rohit Natesh & Ruchitha DJ

Bengaluru: Inspired by the idea that reading is a joy no one should be deprived of, two youngsters have developed an advanced Braille reader and navigation system.

Ruchitha DJ and Rohit Natesh have created a prototype of the system that consists of a box-like device generating real-time Braille impressions. The user needs to click on the link to an article or a book's PDF and the text is converted into Braille immediately. "The system is developed to have a visually impaired-friendly interface with help of voice instructions and a physical button setup," Ruchitha said.

She told **TOI** the idea was born during one of their meetings with visually impaired students. "We used to work for an NGO and realised there is so much material online and outside that the visually impaired cannot read or access. Not every book is available in Braille. Though there are technologies that convert texts into audio format, we saw there wasn't much attention paid to converting data into Braille," she said, adding that the system can also help new Braille users learn the language.

The prototype was part of the duo's engineering project at MVJ College of Engineering. They spent nearly three years on research. They won the Smart India Hackathon for their work. Ruchitha said they could not keep the device as compact as a mobile but tried to keep it cost-efficient. "It cost us Rs 5,000-6,000 to develop the prototype, which might reduce even further," she said. However, the two are unsure of how to take their project forward as they have no experience in business or entrepreneurship.

THE TIMES OF INDIA
2 TIMES CITY THE TIMES OF INDIA, BENGALURU MONDAY, AUGUST 23, 2021

B'luru engineering students bag top spots in design competitions

Farheen.Hussain
@timesgroup.com

Mithun Francis P | Koushik U | Keerthi GN | Atyab Hakeem | Amruthamshu KP

CREATIVE STREAK: (Above) The plane designed by MVJ College of Engineering students. (L) The team from RV College of Engineering with hybrid race car

Bengaluru: Students from two city engineering colleges have won accolades for their unique designs — a plane that can take off vertically and a car that can either run on a combustion engine or an electric one.

While students from MVJ College of Engineering bagged first prize at National Aerospace Conceptual Design of 'Air Taxi' — Inter-city Electric Vertical Take-off and Landing Aircraft (ICeVTOLA) — RV College of Engineering students clinched the top spot for their design of hybrid race car at the Formula Hybrid Competition held in 2021 at New Hampshire Motor Speedway, USA.

Students of the aeronautical engineering branch at MVJ College of Engineering designed an air taxi that aims to make travelling convenient while reducing congestion on roads, improving safety and mitigating emissions.

The team comprised Keerthi GN, Amruthamshu KP, Koushik Udayachandran, Mithun Francis P and Atyab Hakeem. Their creation is similar to the conventional plane but can land and take off vertically, requiring less space to land and recover, making it runway independent.

The MVJ team, named Abhimanyu 4.0, was awarded a cash prize of Rs 20,000 and certificates. The competition was organised by the design division and Mumbai branch of The Aeronautical Society of India. Keerthi said their product is expected to enter the market in 2031 and they now plan to publish their paper. "Our design made the cut because it was not complex and ticked all the boxes of an innovative, eco-friendly option," she said.

The Formula Hybrid Race Car designed by RV College of Engineering students won the Best Project Management award. A team of 29 students from Ashwa Racing — the racing division of Ashwa Mobility Foundation, a student research and development project undertaken by students of the college — took part in the virtual event. Members of the team conceptualise, design and construct various mobility prototypes.

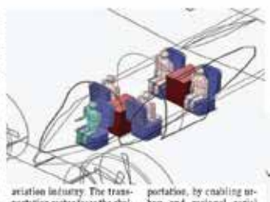
Dhruv Gupta, the team captain, said their prototype won owing to their project plan, ideas and design. "Ashwa Racing has secured a podium since 2017 at the Formula Hybrid event and stood first in 2020 and 2021. This year, our car has a feature which gives the driver a choice to pick a combustion engine (petrol/diesel-powered) or electric engine as per requirement," Gupta said. "A focus on sustainable green mobility development inspired Ashwa Racing to adapt in-house developed parallel hybrid architecture. The design certainly paves the path for a future with less dependence on fossil fuels," he said.

Ravindra S Kulkarni, faculty advisor, Ashwa Racing, and prof and head, aerospace engineering department, RVCE, said the team has come a long way since its inception in 2003.

2 NAMMA BENGALURU HANS INDIA

MVJ College of Engineering bags first prize in design competition

Hans News Services
Bengaluru



MVJ College of Engineering has bagged the first prize in the virtual National Aerospace Conceptual Design Competition (NACDeC-IV) held recently. The college beat top institutions like IIT Bombay, BMS College of Engineering, Sastra University and Manipal Institute of Technology, to take home the prestigious prize. The MVJ team, named Abhimanyu 4.0, was awarded a cash prize of Rs 20,000 and certificates, for their excellent work. The competition was organised by the Design Division and Mumbai branch of The Aeronautical Society of India.

The theme of the project was related to the conceptual design of Inter-city Electric Vertical Take-off and Landing Aircraft (ICeVTOLA). The competition witnessed participation of 26 teams, of which 5 were shortlisted for the final round (4th round). After these five teams presented the salient features of their projects, the MVJCE team was declared winners. The team members were Keerthi G N, Amruthamshu K P, Koushik Udayachandran, Mithun Francis P and Atyab Hakeem from Aeronautical Engineering. MVJ College of Engineering has been the winner of National Aerospace Conceptual Design Competition consecutively for four years from 2017-18 to 2020-21.

This conceptual design is a potential idea that can usher in a remarkable revolution in the aviation industry. The transportation sector faces the challenge of meeting a growing demand for convenient passenger mobility, while reducing congestion, improving safety and mitigating emissions. ICeVTOLA could overcome these limitations of surface transportation, by enabling urban and regional aerial travel services and is a technology that could end traffic jams. It connects the metros to nearby cities, provides connectivity to augment tourism, and aids in the strategic travel by public agencies. Urban air mobility (UAM) is an emerging aviation market that seeks to revolutionize mobility around metropolitan areas, via a safe, efficient, and accessible on-demand air transportation system, for passengers and cargo.

The MVJCE students from the Department of Aeronautical Engineering, who worked on the project, said, "The project was a challenging task as we had to discuss, communicate and do all the work, virtually. Since ICeVTOLA is a new concept, there are no online resources, and hence it required rigorous brainstorming. Through the NACDEC competition, we were able to develop the critical concepts that can add practical applications. This integration helped us design the airship. It has enhanced our understanding of the topic and opened up opportunities for us to perform even better in future and prove our capabilities. We would like to express our heartfelt gratitude to our college, Head of Department Aeronautical Engineering, Prof S. C. Gupta, mentor Dr. S Rajasekar, and all other faculty members, for their constant support."

Commenting on the students' performance and the project, Prof. S C Gupta said, "I believe our students represent the true spirit of our motto, 'Engineering A Better Tomorrow'. The project concept was meticulously developed, and a lot of thinking went into the integration of theoretical aspects for practical applications. We commend the hard work and effort of the students who have crafted a futuristic concept. I am very grateful to all the faculty for nurturing such talents."

MVJCE students design 'portable and cheap' Braille converter

BENGALURU, DHNS: A newly designed hand-held Braille converter is making life easy for the blind.

Now, the blind can walk into a library, pick up a book of their choice and allow the converter to transcribe it for them.

The device, BBook, which converts text into Braille real-time, is the brainchild of two Computer Science Engineering students -- Rohit N and Ruchitha D J -- belonging to Bengaluru's MVJ College.

Inventors of the device explained that the scarcity of Braille books -less than 1% of the printed books are transcribed into Braille- as the major reason behind designing the converter.

Braille books are heavy and unwieldy, they point out. For instance, a 500-page Braille book weighs at least four kilos. Moreover, they cost ten times more than regular books.

Hooked to the internet, the BBook can also download news articles and magazines and transcribe them for the user's benefit.

The BBook, a Braille device, developed by students.

"Characters are picture-mapped and converted to Braille," Rohit told *DH*, adding that the device allows the blind to access books that remained out of reach for them.

Besides the hard copy, BBook can convert even digital materials. "These could either be in PDF or Word format," Rohit said. "Digital books can be converted letter-by-letter."

The Braille converter was among several products on display at the Visweswaraya Industrial and Technological Museum on Saturday.

"Initially, we weren't sure if the product would make a difference. We visited Sri Rakum School for the Blind in Indiranagar and interacted with the teachers. With their encouragement, we took two months to work on the converter," Rohit said.

They tested the proto-type of the product with the blind students of Rakum School. "The students have suggested some minor changes and we're working on it. Once the product is ready to be marketed, we expect its price to be below Rs 5,000," Rohit said.

MVJ STUDENTS DEVELOP A BLUETOOTH-BASED ATTENDANCE TRACKING SYSTEM

Students from MVJ College of Engineering display their aqua soccer project. SPECIAL ARRANGEMENT

Students design robot that may clean lakes

Rakshitha R

BENGALURU: The students of MVJ College of Engineering unveiled a robot that can float in water and play soccer. Upon improvisation, the robot may help reduce the pollution in city lakes too.

The robot was showcased in Vertechx 9.0, an intercollegiate technical fest held in the college on Friday.

"We can fix a few minor problems. For example, we can put a net in front of the robot and collect all the dirt from the water without having to step into the water. If I lose anything in the water, I can engage high frequency sonic sensors which will help locate the lost object," explains Suraj M Singh, a third-year student of electronics and communication.

The robot was conceived along with two other students - Yashwanth Singh and Vishnu Maheswar - for a competition titled aqua soccer.

"The concept is similar to that of a remote-controlled car but with some tweaks. Instead of round wheels, we have put paddles, so that the robot can go back and forth in water. We used an app from the playstore called RC controller, which works with Bluetooth," adds Singh.

The students say the robot, if developed can help resolve the contamination of Bengaluru lakes.

Another team, meanwhile, designed a voice-controlled robot that can perform tasks based on voice inputs. "Our robot can pick up a ball and place it elsewhere. It can move forward, backward and sideways based on the programmed voice input," explains Shakthi Vel, a third-year electronics and communications student.

"We created a voice-recognition app using our own code. The app is connected to Bluetooth which in turn is connected to the robot's motor driver.," adds Vel.

The model is slightly better than real-time voice sensing robots.

DH News Service

A hearing aid that fights stigma via glasses

Reshma Ravishanker

BENGALURU, DHNS: In news that will come as music to the ears of those with partial hearing loss, two Bengaluru-based students have developed a hearing aid that can be worn like spectacles, thereby addressing a major issue with hearing aids: social stigma.

Nishanth Shastry and Rakshanda B Reddy, second-year Electronics and Communication students from MVJ College of Engineering, are the brains behind the fashionable device, BoCo.Aid, which doesn't need to be inserted into the ear.

The device works on a bone conduction transfuser system, which is installed in the device.

In simple terms, a coil in the device gathers sound. Adjacent to it is a plate which vibrates and passes it onto the temporal bone, which sends it to the cochlea enabling a person to hear.

Speaking to *DH*, Shastry said since the device doesn't need insertion in the ear, it would help patients who have an issue with the auditory canal.

However, the limitation is that one would not be able to use it in case of senso-neural damage or damage to the cochlea.

The hearing aid developed by Nishanth and Rakshanda.

"We worked in consultation with a few ENT specialists around Bengaluru. We have a prototype and hope to approach the industry soon," Shastry said.

Shastry, who hails from Mangaluru, said he conceptualised the device even before he entered college.

Social stigma

One of the major concerns the students hope to address is stigma. "When someone has a problem with seeing and wears spectacles, it is not seen as an impairment. Yet, when someone cannot hear and wears an aid, there is a stigma associated with it," he said.

The device will be broader than conventional glasses at the rim in order to accommodate hardware. The battery operated device will function for about 12 hours and can be recharged.

The duo hope to make the device available for about Rs 10,000.

THE NEW INDIAN EXPRESS
MONDAY, JULY 2, 2018

edex YOUR LIFE COACH

SOLUTIONS ON FIELD, JUST A CLICK AWAY

farm tech

A device developed by two students of MVJ College of Engineering, Bengaluru offers solutions to the major problems faced by today's farmers, finds ***Parvathi Benu***

Crop failure, over-irrigation, water logging, desalination of soil, middlemen — the problems faced by an Indian farmer are endless, even in an age where technology is believed to have the ability to control just about anything. So, why don't we use it to help the ones who give us the food that we eat, wondered **Prakhar Vignesh** and **Praveen Kumar**, two final year B Tech students of **MVJ College of Engineering**, Bengaluru.

That's why the duo has developed a device that lets the farmer irrigate the field for the required amount of time, test the soil's nutrient content and also connects them directly to the buyers, without any involvement of the middlemen. "Usually, because of the constant power failure, farmers fail to irrigate the fields for the required amount of time. This can lead to crop failure," says Prakhar. "Sometimes, the farmer forgets to turn off the motor leading to over-irrigation, which in turn causes desalination and waterlogging," he adds. They had access to first-hand farm information and farmers' problems because Praveen's father owns some farmland.

But the device has managed to effectively solve this issue. "With the help of this device, whenever the power resumes, the motor starts from the point where it has stopped. There is also a mechanism that makes sure that the irrigation stops if the water reaches the end of the field," says Prakhar. The device's app also has a platform that connects the farmers directly to the buyers and that way, middlemen are completely out of the scene. Now, wait for the best part. Since the device is programmed through an app, the farmer can control the working of the motor sitting anywhere in the world, just using their smartphone. The app also informs the farmer when there is a power failure.

The duo now has a prototype and are hoping to test it with farmers soon. If all goes well, they will scale it up and launch the app on mobile platforms.

DRIVERLESS CARS SOON TO BE A REALITY?

Even though the idea of a driverless vehicle is a distant dream in the country, this duo dreams of putting out these cars on the city's roads

Express Features

Although India is no where near the conversation of cross-country autonomous or driverless cars, two engineering students from a city college are trying to make some headway in this direction.

Saurabh Bhardwaj and Kiran Jojo are final year computer science engineering students who have designed a miniature prototype of a driverless car using the basic components and methodology that renowned companies such as Apple, Google and Uber are presently using to design their cars.

The two students from MV College of Engineering, however, have brought in their own innovations in various aspects of the design. "The computational power of our driverless car system is not that powerful. We have therefore reduced the amount of data to be processed. In the present driverless cars, the computers processes data from the sensors that takes out only information of the line of vision on the road but uses other areas such as the side mirror sensors. In our prototype, we have completely left out the data from the car's line of vision so as to reduce the load on computation," explains Saurabh.

"We have conducted trials on a small track of around 24 meters full of obstacles such as speed breakers and signals. I would say, we are partially successful," adds Saurabh.

The prototype is 20 cms in length, 16cms on its height and a width of 12 cm. It has a four-wheel drive chassis and as a base. A Raspberry Pi is a kind of basic computer used for graphic processing unit (GPU) and the CPU computation. A Nvidia driver powers the prototype along with four batteries. The car uses a Pi camera and ultrasonic sensor to detect obstacles. The camera is mounted on a servo motor to make the head (camera) flexible to rotate.

The basic motive that many researchers is focused on their model.

"The work could be enhanced by improving the algorithms by adding machine learning to it. The present algorithm performs the operations on all the frames it receives but its efficiency could be further enhanced if it starts learning by itself and avoids unnecessary executions of the regions which are already known as free line. Once the car starts running on the roads, it determines the obstacles (mostly static) on the way and notes their characteristic features," says a statement by the team.

While driverless cars are still a distant dream even in the West

City students devise a smart system for waste management

Sandra.Fernandes@timesgroup.com

Students of MVJ College of Engineering have come up with a waste management alert and tracking system that proposes efficient waste disposal and collection. The system uses an IoT interface along with a smart bin, which send a notification to the driver to come and collect the garbage once the bin is full.

The four-member team behind the project comprises second year engineering students Saivenket Patro, Megha S, Nikitha S and Suvra Pratim Roy, who worked collectively for a week to come up with this project. Speaking to us, Suvra says, "There was a product development competition in the college and the options given to us didn't suit us. One day, when all of us were walking along the road, we noticed a big pile of garbage and thought 'why not devise a system where the garbage collection is efficient?' That's how the idea cropped up."

What followed next were several brainstorming sessions. The system, he says, uses smart bins equipped with a load sensor, ultrasonic sensor, a humidity sensor and a ESp266 model. The load and ultrasonic sensors produce data with respect to the dustbin's filling capacity. "Once the dustbin is full, the driver at the garbage collection truck — who is equipped with a smartphone with the app installed — will get a notification to collect the garbage," says Suvra, adding, "The truck will then collect garbage from only those bins that are full and need to be emptied, thereby ensuring better efficiency. It will also reduce fuel consumption and will result in lesser number of trucks on the road."

The group now plans to publish a paper on their project and participate in other competitions in the hope of find volunteers, who will help them take the project forward and on a bigger level.

Saivenket Patro, Megha S, Nikitha S and Suvra Pratim Roy with their project

... during the competition

THE NEW INDIAN EXPRESS
KARNATAKA
07 BENGALURU SATURDAY 06.04.2019
INDIAN EXPRESS Sat, 06 April 2019 epaper.newindianexpress.com/c/42450112

WHAT AN IDEA!

City college students invent smart helmet, apply for patent

EXPRESS NEWS SERVICE@Bengaluru

AVAILABLE in the market soon will be a motorcycle accompanied by a smart helmet which will alert riders of emergency situations while also sending out messages to emergency rescue personnel with the location of the rider, in case of an accident.

The e-motorcycle and smart helmet is the invention of a group of 3rd year engineering students of the MVJ College of Engineering from the city. Though not a part of a compulsory class project, they worked on it considering how increasingly, two-wheeler riders were becoming victims of accidents.

Unique features

- It sends out alert with GPS location of rider to rescue personnel
- Helmet has a multi-directional impact protection system
- Polycarbonate outer shell to provide durability and sturdiness
- Inner material of Koroyd (lining) in the smart helmet absorbs more energy than extended polystyrene

Talking about their invention, Saivenkat Patro, an Electronics and Communications (E&C) student said, "We have applied for patents and also have to conduct trials for the vehicle and helmet. Once this is complete, we will work on permissions from authorities to release these in the market for sale."

The team plans on selling both products as a package instead of as standalone products. "The cost is going to be quite less. We plan to sell both between Rs. 7,000 to Rs. 10,000," he said. The team has named the helmet 'KAWACH'. Other students in the team are Nikitha, Megha S of Electronics and Communication and Surva Pratim Roy of the Computer Science department.

The team is also working on a helmet for construction and mining site workers and will name it Kawach M&C. Another product is a helmet for children named Kawach Junior. "The sensors placed on the helmet alert the supervisor that an accident has occurred and help needs to be sent immediately. Along with the alert message it also sends the location of the accident to make it easier for the help to locate the victim. This helmet also comes with a mechanical SOS button which the person can use when in need.

The advantage of this technology is that the connection between the supervisor and worker is not lost even in adverse conditions like being underground or in a remote area of the site." explained the members of the team.

"Kawach Junior is a variant specially designed for kids. The smart features included in the helmet are the accident alert system, SOS alert and GPS tracking system."

INDIAN EXPRESS Sat, 06 April 2019 epaper.newindianexpress.com/c/38272353

BangaloreMirror Tuesday, July 17, 2018 9

This device could come as a boon for the disabled

| Deepthi.Sanjiv@timesgroup.com
TWEETS @deepthisMIRROR

Team Apollo of MV Jayaraman College of Engineering, Bengaluru, has developed a prototype known as 'Gesture Talk' which will convert sign language into a text or audio message and vice versa. The team comprises final-year engineering students including Devanshu Jha, Chiragdeep Singh Malhotra, Muhammad Hameem Safwat Hussain and Abhishek Nanda.

It was Devanshu Jha who came up with the idea first. "I was disturbed when during a train journey from Bengaluru to Patna, about two years ago, I saw a few challenged people trying to communicate and without an interpreter, the person on the other side was finding

The team with the prototype of 'Gesture Talks'

it difficult to understand what was being conveyed. Often a normal person fails to understand the gestures and our aim is to bridge this gap through a device that we will soon develop. The device can be worn as a neckband so that capturing the gestures through images is easy. After winning prizes at several competitions, the team is now tweaking the prototype before finalising the device," he said.

'I was totally disturbed during a train journey when I saw some people trying hard to communicate'

Converting audio into text

The device will help plugging the communication gap especially among those who cannot hear or speak. It can be used in homes as well as in the public without depending on an interpreter. Devanshu said, "We have used a microcontroller board, along with a sensor to detect the motion of the fingers, hands, and palms. These gestures would then be converted into a textual format. It will also be possible to convert audio sound into text, enabling the challenged to read what the other is saying. Thus, it will be a two-way communication channel. This should help people live independently," he said.

The team is trying its best to see that the device turns out to be a affordable one. The prototype has won several prizes, including one at IISc.

BangaloreMirror Wednesday, September 5, 2018

City students win a prize for amphibious aircraft design

| Bangalore Mirror Bureau
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Team Abhimanyu from MVJ College of Engineering won the first prize (₹20,000) for designing an amphibious aircraft that can take off and land in both a runway as well as at sea. The second and third place was won by the teams from University of Petroleum and Energy Studies, Dehradun, and Sree Ramakrishna Engineering College, Coimbatore.

The Aeronautical Society of India has set-up a Design Division, intended to be the torch bearer for aerospace design professionals. It's National Aerospace Conceptual Design Competition (NACDeC) challenges students to come up with innovative designs. The competition was open to teams of undergraduate students of Aeronautical or Aerospace Engineering department from IITs, IIST, or any other institutions. Each institute could nominate one team consisting of about five members, and one faculty mentor.

The competition was launched on August 31. Post submission of the Conceptual proposal, nine teams were shortlisted for the next stage.

The nine teams had to design their aircraft and submit a detailed report with all necessary drawings, calculations. Of the nine teams, five were shortlisted for the finals.

The aircraft designed by the students met all the Specific Requirements of the Passenger (PAX) Mission as well as the Air Sea Rescue (ASR) Mission

The team was asked to give a presentation on their design. This was followed by a question and answer session from the expert panel of judges.

Team Abhimanyu from MVJ College of Engineering, Bengaluru included Nandakumar Abbigeri, Radhakrishna, Sriram, Shrikrishna , Hayath Khan and Prof SC Gupta as Faculty Mentor.

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Due to a personal experience, this Bengaluru-based entrepreneur found a problem and solved it through his app STABL

A FRIEND IN NEED FOR A 'STEP TOWARDS BETTER LIFE'

Team STABL

Express Features

Rohith N, an engineering student from a village near Kolar moved to Bengaluru to pursue his higher studies. His experiences during his stay in a new city led him to create an app and a business out of it eventually.

"I stay in a paying guest house near my college. Once due to bad weather, I caught flu. There was no one to take care of me and I was all on my own. Finding a doctor and going to a clinic without anyone's guidance and help was a real pain. After some struggle, I managed to find a doctor and visit-ed him and the next issue was getting medicines," narrates Rohit.

He says he did not have the strength to go and even get the food or prepare it on his own. After this experience, he tried to search for an app that might help people tackle such problems but all in vain, he says. As a result, he came up with an idea to create an app to provide all these services. Some time ago, Rohit and his classmates Ruchitha M, Shreyas S and Sreeram D Nair, at the computer science department at MVJIt College of Engineering, developed a working prototype of the STABL (Stay towards Better Life) app.

"The app has been developed keeping in mind the numerous people in Bengaluru who come here for work or study and do not know anyone in the city," adds Rohit. A person can mention the symptoms that he or she is suffering from on the app. A doctor checks these symptoms and prescribes the required medicine. In case of a serious case, the doctor will physically come and check on the patient. "For cough, cold and flu, there would be no problem in doctors prescribing medicines without a one on one interaction. However, for serious cases, physical check is necessary," says Rohit. The prescription can be sent to the nearest pharmacy and the medicines would be delivered via the app.

While the app is not fully functional, yet, it will also include an option to hire nurses in case of sickness. "We are still working on the app and will come out with a fully functional version very soon." Apart from this feature, the app also ensures hes what hes food to be consumed for a speedy recovery. The recipes for the suggested food will also be displayed. The option to order food is also available on the app.

In a nutshell

STABL was started out of experience by an engineering student.

Rohit along with his classmates put together an app to find medical help and pharmaceutical for those in alien city.

STABL app was made by Rohit and his classmates as a prototype and a sanbox from their own acquaintances.

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Watch for 'Kawach'

No helmet? Device prevents bike from starting

Reshma Ravishanker

BENGALURU, DHNS: A group of students from a college in Bengaluru have devised a system that will not let a rider start his vehicle if he does not have the helmet on. What more? The rider cannot also ride if he is drunk too.

A group of students from MVJ College of Engineering have now designed Kawach, a smart helmet that has multiple functions based on the three different models.

The helmet that is connected to the bike through various modes, does not let the bike start when the user has not worn a helmet. Besides, sensors in the helmet automatically detect whether the rider is drunk and do not let vehicle start.

Kawach M&C, a variant of the smart helmet is the advanced version that can be used by construction workers and miners. The sensors placed on the helmet identify the threshold of a vibration and alert the supervisor that an accident has occurred and help needs to be sent immediately.

Students of MVJ College of Engineering with the smart helmet. SPECIAL ARRANGEMENT

Along with the alert message, it also sends the location of the accident to make it easier for rescuers to locate the victim, according to the college. This helmet also comes with a mechanical SOS button which the person can use when in need.

The hemlet has been designed by four students Saivenkat Patro, Nikhitha, Megha S and Suvra Pratim Roy. Megha said, "Several lives are lost every year due to bike accidents. The idea behind the system is to prevent deaths. These helmets and bike systems are linked by GPS and GSM sensors for connectivity and an emergency contact receives messages in case of an accident. It has an alcohol sensor to check whether the driver is drunk or not. Touch sensors ensure the helmet is worn and connected via bluetooth."

The students also hope to incorporate models with cooling systems for riders during summer and defoggers to get rid of the fog and droplets on visors during monsoons.

These systems would be priced at Rs 6,000 on an average for the consumer, the students said.

The Harish Nanjappa incident

"We read in the newspaper about a rider, Harish Nanjappa, who died because he did not get timely help. He was lying on the road in pain for 20 minutes even as passersby looked on. Though there were many around, the ambulance did not reach on time. An advanced system like this can send messages to emergency contacts and death can be averted," Nikhitha, one of the students, said.

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Student comes up with fruit-peel solution for Bellandur Lake woes

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Bengaluru: Intrigued by the frothing of Bellandur Lake on his way to college, a II-year undergraduate student with MVJ College of Engineering, Whitefield, has come up with a filtration process using fruit peels.

Pavan A, who is studying aeronautical engineering, tested the process at the lab of the Karnataka State Pollution Control Board. The results revealed that the treated water was fit for domestic use other than drinking.

The KSPCB lab certificate, a copy of which is with **TOI**, stated that Pavan's filtration process had brought down the pH level of the lake water from 6.8 to 4.08, fluoride content from 3.3mg/l to 0.27mg/l and phosphate from 23.5mg/l to 2.75mg/l.

"Frothing and fire in Bellandur Lake worried me every time I crossed the stretch or read about them in news reports. About eight months ago, I thought of doing something about it instead of just blaming factories for polluting the lake," said Pavan.

INNOVATIVE: Pavan said the treated water can be used for non-drinking purposes

During his research, he analysed that along with volatile components in industrial effluents, the lake water also had fluoride and phosphate contents from household waste like detergents. "Ultimately, all this was leading to the fire too," he added.

After going through several research journals, Pavan collected peels of banana, pineapple, watermelon, citrus lemon and papaya from nearby juice shops for two days and sun-dried them for two weeks.

"The peels were then converted into powder; I used that to create several membranes. These were then activated with the help of hydrochloric acid before the filtration process," the engineering student explained.

It took a day for five litres of water collected from Bellandur Lake to filter through the membranes. The treated water, Pavan said, was found to be usable for domestic purpose, but not for drinking.

Speaking of his long-term plan, Pavan said, "Currently, I am planning to create artificial membrane with the help of nanotechnology. A thick layer of these membranes can be laid on the lakebed to treat the water and make it usable."

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Saving lives in flight mode

Joshi Goutham Sharma and Jervis Anthony of MVJ College of Engineering have come up with an aerial vehicle that might be the future of ambulances, finds ***Parvathi Benu***

DRONE GAME: Jervis and Goutham with the drone

In metropolitan cities like Bengaluru, the only thing worse than road accidents is the loss of life because ambulances cannot beat the traffic and get to a hospital in time. But thanks to **Joshi Goutham Sharma** and **Jervis Anthony Saldanha**, final year B Tech students from MVJ College of Engineering, Bengaluru, this could become a thing of the past. They've devised a high-speed hybrid unmanned aerial vehicle (UAV) that will deliver intensive medical aid and emergency medical services to the site of the accident.

In fact, the med-drone can potentially airlift an accident victim and bypass traffic and blitz them to a hospital — from practically anywhere.

You read that right! The vehicle can fly from one destination to the other, carrying emergency medical aid, completely disregarding all traffic-related issues. The students are ready with the prototype and are excited about its working.

"We designed it keeping Bengaluru's traffic in mind. Some medical emergencies will require immediate assistance. This vehicle will take 8 minutes," says Goutham.

They're also working towards improving the device. "Right now, it is devised in such a way that it can carry a person who weighs 50 kg. But due to space constraints, the person has to be in a sleeping position. We are working on that," he says. Goutham is an Electronics and Communication Engineering student, while Jervis studies Aeronautical Engineering. The expertise in both fields, along with the aid of a few friends helped the duo research and develop the prototype. "The idea behind this drone is very simple. Everyone talks about it. But developing a practical model was actually difficult," says Goutham.

The drone looks like your usual aircraft, but is smaller in size. Also, it is driverless and works according to the directions given by the air traffic signals located in different parts of the city. Also, it is capable of vertical take-off and landing and hence, it wouldn't need a runway to function.

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