Directorate of Technical Education Maharashtra State,
Joint Director of Technical Education, Regional Office, Mumbai

in Collaboration

Mahavir Education Trust's

Shah & Anchor Kutchhi Engineering College

Affiliated to University of Mumbai, Approved by D.T.E & A.I.C.T.E
Mahavir Education Chowk, W.T. Patil Marg, Next to Dukes Company, Chembur Mumbai- 400 088

Proceedings of the NATIONAL LEVEL PAPER PRESENTATION

Technovation

30th April, 2022

Directorate of Technical Education Maharashtra State,
Joint Director of Technical Education, Regional Office, Mumbai

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TECHNOVATION

Technical Paper Presentation

On 30th April, 2022

About Directorate of Technical Education, Maharashtra:

Directorate of Technical Education is to maintain and enhance the standard and quality of technical education by laying policies, establishing and developing Govt. Institutions, guiding and supervising the aided and private institutions, interacting with industry and national level institutions and coordinating with other departments of State Government, Government of India and Statutory Organizations and to contribute to the development of industry and society at large.

About Joint Director, Technical Education Regional Office, Mumbai

Joint Director, Technical Education Regional Office, Mumbai is working under the Directorate of Technical Education, Maharashtra with the objective of maintaining administrative control over the institutions in the Mumbai division. The role of the Regional Directorate is to support the Directorate in maintaining and overseeing the quality of technical education by overseeing and overseeing the functioning of government, aided and unaided institutions under the Directorate.

About Institute

Shah and Anchor Kutchhi Engineering College (SAKEC) was established in 1985 for the purpose of imparting quality technical education. The college is managed by Mahavir Education Trust. The college is approved by AICTE, New Delhi and Government of Maharashtra, and is affiliated to University of Mumbai. It also has an ISO-9001 Certification. It offers undergraduate courses in Information Technology, Computer Engineering, Electronics & Computer Science, Electronics & Telecommunication Engineering, Artificial Intelligence & Data Science and Cyber Security. It also offers Post Graduate Courses in Information Technology, Computer Engineering and Electronics Engineering.

UG Programs in Information Technology and Computer Engineering of the college have been awarded accreditation by National Board of Accreditation (NBA) from A.Y. 2019-20 for 3 Years. The Institute has been ranked in the 251-300 band by National Institutional Ranking Framework (NIRF) for the NIRF 2020. The Institute is awarded 'A' (3.16 CGPA) Grade by National Assessment and Accreditation Council (NAAC) w.e.f. 20th Oct 2021.

About EXTC Department

Department of Electronics & Telecommunication Engg, Shah and Anchor Kutchhi Engineering College, which was established in 2012.The department has qualified, enthusiastic young teaching faculty working with the objective of imparting quality education through the right balance of academics and co-curricular activities. Carefully structured teaching-learning methodology, well-equipped laboratories and various professional activities provide the platform for the overall development of the students. With the passing out of our 6th batch in 2021, we feel proud to have cultivated the essential qualities in students, namely, well-rounded character, a sound academic foundation, innovative thinking, global perspective and social commitment, achieving a combination of comprehensive and individual development.

Patrons

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Chairman, Mahavir Education Trust

Shri. Pramod. A. Naik
Joint Director, DTE-Maharastra State, Mumbai

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Managing Trustee, Mahavir Education Trust

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Trustee & Hon. Joint Secretary, Mahavir Education Trust

Dr. Bhavesh Patel
Principal, SAKEC

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Program Flow

Date: **30.04.2022**

Time	Session
10.00 am - 10.30 am	**Inauguration** Saraswati Vandana Principal Address Chief Guest Address
10.30 am -11.30 am	**Keynote Address** on "Writing Scholarly Articles in Engineering - Sharing my Publishing Experience in Nuclear Journals."
11.30 am – 1.00 pm	Parallel Paper Presentation: Morning Session
1.00 pm - 02.00 pm	Lunch Break
02.00 pm - 04.00 pm	Parallel Paper Presentation: Afternoon Session
04.00 pm - 05.00 pm	Valedictory function

Mr. Pramod A. Naik
Joint Director,
Technical Education,
Regional Office, Mumbai.

I am delighted in acknowledging the Technical Paper Presentation "TECHONOVATION 2022" on April 30, 2022 under the umbrella of "Azadi ka Amrit Mohotsav" organized by Shah & Anchor, Kutchhi Engineering College which had great student participation and involvement of more than 75 groups from Mumbai and around Participated for this Paper Presentation.

Azadi Ka Amrit Mahotsav is an initiative of Government of India as well as Government of Maharashtra to celebrate and commemorate 75 years of independence and the glorious history of our people, culture and achievements.

Events like these are great boosters for students and faculties as these provide eclectic papers for gaining knowledge. I appreciate the coordinators and organizing committee for showing a keen interest in organizing a successful Paper Presentation event and contributing new ideas and findings. I wish them for their endeavours to spread knowledge.

I congratulate all the students for their enthusiastic participation and making the event a grand success.

Dr. Bhavesh Patel
Principal, SAKEC

On behalf of the Mahavir Education Trust's Shah & Anchor Kutchhi Engineering College, we would like to extend our warm welcome to all the presenters and participants, and, we would like to express our sincere gratitude to our invited speakers, session chairs and Jury members. This Technovation - National Level Paper Presentation is organized by the Department of Electronics and Telecommunication Engineering in association with Directorate of Technical Education, Maharashtra State and Joint Director of Technical Education, Regional Office, Mumbai, and is intended to be the first step towards a top-class Paper Presentation.

We believe that Technovationevent will give opportunities for sharing and exchanging original research ideas and opinions, gaining inspiration for future research, and broadening knowledge about various fields in advanced area of Telecommunication integrated with computer science and information systems, amongst members of research communities, together with researchers from different parts of Country.

Selected papers will be presented during Technovation. We also want to express our sincere appreciation to the members of the variousCommittees for their critical activities, as well as the Proceedings Committee for the time and energy they have devoted to editing the proceedings and arranging the logistics of holding this event. We would also like to give appreciation to the authors who have submitted their excellent works to this conference. Last but not the least, we would like to extend our gratitude to the Directorate of Technical Education, Maharashtra State, and Joint Director of Technical Education, Regional Office, Mumbaifor their continued support towards theTechnovation.

Dr. T.P. Vinutha

Convener
I/C HoD EXTC, SAKEC

It is my great pleasure to present the proceedings of TECHNOVATION- NATIONAL LEVEL PAPER PRESENTATION", organized by the department of Electronics & Telecommunication Engineering department with Directorate of Technical Education Maharashtra State and Joint Director of Technical Education, Regional Office Mumbai, under the theme of 'Azadi ka Amrut mahotsav', via online mode.

The objective of this competition at the national level is to provide an open platform for presenting innovative ideas through the paper presentation and competing tip-to-tip with the sharpest minds in various concepts of Ideas/ Innovation /Technology. This event marks the shifting of the orientation of the Outcome Based Education (OBE) curriculum towards self-learning and projects based implementation that aims to build the confidence in students to pitch their ideas confidently to the expert panel and fellow students.

We are honored to have Mr. Jitendra Nikhade, Assistant Director (Technical), Joint Directorate of Technical Education, Regional Office, Mumbai as the Chief guest and Dr. A. P Tiwari, Director, Knowledge Management Group, BARC, who is also a Senior Professor at HBNI Mumbai as the keynote speaker for the Inauguration of this special occasion.

We got an overwhelming response from all over India. Out of these, 77 groups were shortlisted and called for presenting their project work via live presentation in the respective session, which will be judged by the expert panel based on the originality of the research work along with clarity of content and oral presentation.The cohesive efforts of a dedicated and committed team become necessary for organizing such an event. We are fortunate to have such a hardworking team with us. I wish for the grand success of the event!


Directorate of Technical Education Maharashtra State,
Joint Director of Technical Education, Regional Office, Mumbai
in Collaboration
Mahavir Education Trust's
Shah & Anchor Kutchhi Engineering College
TECHNOVATION
Technical Paper Presentation
On 30th April, 2022
आज़ादी का अमृत महोत्सव

Chief Guest


Directorate of Technical Education Maharashtra State,
Joint Director of Technical Education, Regional Office, Mumbai
in Collaboration
Mahavir Education Trust's
Shah & Anchor Kutchhi Engineering College
National Level
TECHNOVATION
Technical Paper Presentation
On 30th April, 2022
आज़ादी का अमृत महोत्सव
Mr. Jitendra Ramdasji Nikhade
Assistant Director (Technical),
Joint Directorate of Technical Education,
Regional Office, Mumbai.
• Working in the field of Technical Education since 1992.
• Workedaround 7 years as Assistant Professor in Government College of Engineering, Chandrapur.
• Served as System Analyst in Maharashtra State Board of Technical Education (MSBTE) for 10 years.
• Worked for 4 years as System Analyst in Government Polytechnic, Mumbai.
• Served as Head of Department and In-charge principal in Government Polytechnic Thane.

Key note Speaker

Session Chair:

Session Chair:

Session Chair:

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iWitness- An Android Application for Reporting Incidents through Multimedia

Harsh Nalin Dhulla1, SuyashJayendra Ekhande2, Urvin Hemant Savla3, and Ms. Shahzia Sayyad4
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Today's world is getting overwhelmed with increasing crime/incident rate which is still being reported via traditional means, which might not be the most efficient way. The crime rates in India are on the rise every day. The crime rate has increased by 28% in 2020 compared to 2019, according to the National Crime Records Bureau (NCRB). Also, around 4 lakh people die every year due to various accidents and mishaps.

In order to report the incidents via existing systems, the citizens usually have to make a phone call or reach in person to the nearest police station/hospital to inform the authorities. After reporting there used to be a lot of paperwork and follow-ups. Existing methods of reporting the incidents have many flaws, first of all, there are no proper insights for the respective authorities before reaching the incident scene, and also people are reluctant towards traditional methods because of the long paperwork procedure and follow-ups.
Various automated systems were proposed in the literature to report incidents. However, some systems did not support video or audio capture while reporting a crime (only text and image options were available). Some systems allowed anonymous reporting of incidents, though being a feature could prove as a drawback because there could be many spam/bogus reports reported by unverified users. Many of the existing incident reporting systems were created to report only a particular type of incident

To ease the task of reporting and reducing paperwork, we propose a system where the citizens will be able to report different types of incidents such as accidents, robbery, theft, molestation, etc. through their smartphones with a geo-tagged multimedia report which includes textual description, images, audio, and video. The citizens need to verify their email address in order to use the app, this helps reduce the spam/bogus reports which were present in existing systems due to the anonymous reporting feature. The app will have an admin module, the reported incident will be sent to the admin who can view the report and assign the case to an available responder. The admin also has the option to SMS or call the responder. There is a newsfeed feature, where the admin can post about the important alerts or safety precautions. Admin can block spam reporters, reassign a responder and reopen a previously closed case in the future. The app will also have an email notification functionality to notify the respective users of the system about the updates on the incident status.

This project helps to simplify the process and motivate the citizens to report the incidents. This would also prove beneficial in safeguarding our society.

Wireless Communication - Lifi Technology

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We have a number of wireless communication technologies such as satellite communication, wifi, bluetooth, broadcast radio, microwave communication, etc. The speed of Wifi connections are far more slower than a wired connection (around 1-54 Mbps). Even though many encryption techniques are taken by the wireless networks, they are still vulnerable to hacking. Without consent, users may connect to a fake ID. There are also certain conspiracy theories about Wifi that it causes health issues in humans. Same as the effects caused from the Microwave frequencies (EMF).

LiFi (light fidelity) technology is a bidirectional wireless system that transmits data via LED or infrared light. It was first unveiled in 2011 by Prof. Herald Haas. This is an extraordinary advance over today's wireless networks. LiFi uses LED bulbs and light signals to transfer and receive data. It is a system which uses light to send wireless data embedded in its beam. A Li-Fi enabled device converts the beam of light into an electrical signal. The signal is then converted back into data. LiFi multiplies the speed and bandwidth of wifi, 3G and 4G. With LiFi, we can get band frequency of 200,000 GHz, versus the maximum 5 GHz of the wifi and can transmit much more information per second. It is much more fast, cheap, sustainable, accessible, secure, reliable and has no interference.

LiFi can enable secure wireless communications, connectivity in RF hostile environments such as petrochemical plants and hospitals. LiFi also provides high speed, dense and reliable networks for enterprise environments and a pathway to enable smart buildings, transport, cities and nations. It can be widely used in military, underwater communication, Internet of Things and for security purposes. The company started by Professor Herald Haas in 2012 know nas pure Lifi is performing experiments and researching the advancements in this field. There is certainty in development of future applications of Li-Fi which can be extended to various platforms and different walks of human life. This technology has the potential to become
mainstream, so gear up for it!

Material Handling In Warehouse Facility

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Raw Material Handling is the intertwind system which include similar conditions as storing, controlling of material, moving and handling by methods of graveness, human effort and electric actuated equipments. Raw Material handling ensures the timely delivery of asked volume of material at asked position with minimal cost.

Raw Material Handling is not a manufacturing process but involves substantial quantity of product cost and labour. A Raw material Handling system should be choosen in such a way so that to reduce manufacturing cost and avoid damage.

Aim of this project is the warehouse material handling ensures proper organization and storage of raw material in such a way that they can picked them quickly. On the other hand, employees can take advantages of material handling systems to complete their work faster. Material Handling processes can reduce movement and work of employee by substituting with automated and semi-automated equipments. Increased storage capacity through better utilization of storage area.

To make the android application most viable the base SDK variant ought to be characterized as 15 and the objective SDK adaptation ought to be characterized as 28.
This mobile system is a redesign on the conventional retail location or stock administration systems which we see in huge corporate store, clinical stores or modern
Distribution centers. Generally, a great deal of equipment hardware like CPUs, POS machines monitor screens, physical standardized identification scanners, and so on. These equipment needs are wiped out by utilizing cell phone as the screen and handling unit, incorporating standardized tag looking over a phone camera.

This lessens the essential speculation costs. An overall information base of normal classification can be associated with the application at the hour of delivery. Thus, the Work of beginning information section on the proprietor's side will be altogether diminished. Since the mobile application as of now takes into account adding and Eliminating classifications, the proprietors can adjust this information base according to their will and prerequisite. One of things to come extends of this application is
that the handling can be assumed control over the cloud so that the application devours less memory space however works rapidly and efficiently. The app feature
addition & removal of items along with filter functionality using various categories and parameters. New products and categories can be added, removed as well as
edited in the system. It also has an authentication system which ensures a secured platform and removes the possibility of unauthorized access.

IOT BASED WEATHER MONITORING SYSTEM USING NODE MCU

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A weather monitoring is a device that collects data related to the weather & environment using different sensors. There are two types of weather monitoring. One which is have inbuilt sensors and the second type of weather monitoring is where the data is extracted from the weather station servers. Weather checking of the environment is essential because weather changes everyday according to the outside conditions.

Weather plays a very important role in humans physical and psychological health. So, we are making this device to get the information about temperature, pressure, humidity and rain. Here we are using various types of sensors like DHT11 for Temperature and Humidity, BMP180 for Pressure and Rain Sensor. These sensors are present in Prototype so that we can measure the parameters. The Node MCU8266 based Wi-Fi Module is a brain of this device. All the sensors are connected to Node MCU8266.

The Environment and Economic Benefits of Recycled Concrete Aggregates

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The construction industry being a major contributor to construction and demolition (CD) waste, adoption of sustainable practices in its activities has been the need of the hour. As per the Indian scenario, concrete has been the major constituent of C&D waste in urban areas, which can be recycled to get recycled concrete aggregates (RCA).

Recycled concrete aggregate presents numerous benefits, like., increased protection from seepage, reduced costs, since it doesn't need to be mined, reduced environmental impact, more appealing to governments and customers, preserves natural resources such as gravel, water, coal and oil, reduced space wastage in landfills. Natural aggregates have bigger impact on environment because of mining them involves digging up the land, it also requires use of natural resource to extracts, the production of recycled aggregates conserve resources and produces the build-up of landfills. Natural material extraction and processing always impacts on the environment, like., soil degradation, water shortage, biodiversity loss, damage to ecosystem functions, global warming exacerbation. Generally, virgin materials are more expensive then recycled aggregates.

The scarcity of natural aggregate (NA) has led to the use of RCA as an alternative option in the production of sustainable concrete. However, production of recycled concrete aggregates is less expensive than that of natural aggregates. For instance, the long-term cost of producing one tonne of coarse recycled concrete aggregate was about 40% less than that for coarse natural aggregate. Also, the environmental benefit of producing one tonne of recycled concrete aggregate was approximately 97% higher than that for natural aggregate. Hence, the commercial production of recycled concrete aggregates from waste concrete should be promoted as a cost-effective and environmentally beneficial approach for implementation in the construction industry.

This study has been carried out for Bengaluru, which is the fifth largest metropolitan city of India and is branded as the 'Silicon Valley' of India for leading the growth of Information Technology based companies. BruhatBengaluru Mahanagara Palike (BBMP) is the administrative body responsible for civic and infrastructural facilities and it is run by a council. Bangalore Development Authority (BDA) is responsible for principal planning and zoning regulation of the city. According to the official estimate of the BruhatBengaluru Mahanagara Palike (BBMP), the Construction and Demolition (C&D) waste generated daily in Bengaluru amounts to approximately 4000-4250 tons/day — a gross underestimation considering extensive development work undertaken by government agencies and private developers.

The study also investigates national and international level construction and demolition waste management. Carbon emission from clay brick building and concrete masonry building is analyzed using Autodesk Green Building Studio, regarding the practice of using recycled aggregate in the building has accounted for the environmental and cost benefits of recycling construction and demolition waste. It is essential for project managers and decision-makers to better understand the cost-benefit of demolition waste (DW) management, to promote development of an effective waste management plan. Cost of 1m3 Quantity of Natural Aggregate = Rs.740 Cost of 1m3 Quantity Recycled Aggregate = Rs.560 Difference in cost of Natural aggregate and Recycled aggregate for 1m3 = Rs.180 Therefore the percentage decrease in the cost is 22.32%

Dual Power Generation Solar Plus Windmill Generator

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The hybrid system with solar and wind energy is applicable for power generation in both rural and urban areas. The hybrid system maintains a continuous supply of power. Hybrid system utilizing energy from nature. Can overcome the drawbacks caused due to unfavorable climatic conditions in the environment.Energy from Solar and wind for power generation is a promising solution to pleasing the demands of both the rural and urban populations. Utilizing renewable energy can overcome several issues in the environment like environmental pollution, degradation of fossil fuels leading to global warming can be reduced therefore, the ecological balance and climatic conditions can be maintained.

Renewable energy has been on increasing demand in the recent due to over stress on non-renewable resources and their increasing cost. Thus producing electricity with the use of renewable resources like Wind and Solar has been taken up in this project. A Windmill, which rotates when there is enough wind, generates electricity owing to magnetic coupling between the rotating and stationary coil. A horizontally rotating prototype of Windmill is being used in this project. Silicon based wafers which are cascaded together to form a Solar Panel is being used in this project to generate electricity.

Dual Power Generation Solar + Windmill System harnesses both the Solar and Windmill i.e, Wind Turbine Generator to charge a 12V Battery. The System is based on Atmega328 microcontroller which smartly senses and charges the battery while displaying the voltage on the LCD. The Windmill, when in enough wind to drive it, generates power enough to charge a battery.
Similarly, the Solar Panel which is mounted on a rotating panel which sets itself to maximum exposure of the daylight to generate energy enough to charge the battery. Since both of them simultaneously can work in favorable natural conditions, both can charge the battery at a faster pace than they would have individually. Thus this project is an example how natural resources can be efficiently harnessed to produce electricity at a faster pace and cheaper rate.

The subsection of the results' discussion and analysis is disciplined into three main sections which are started with the generated power outcomes of the proposed system, strength and strain analysis, and then ends with the CFD analysis for effective airflow characteristics around the windmills of the used system.

IOT Based Smart Irrigation System

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Agriculture is the major source of income for the largest population in India and is major contributor to Indian economy, and it always depends on farmers and farm workers. To reduce their efforts and to give the correct amount of water to fields we proposed this IoT based irrigation system. IoT Based Smart Agriculture Water System scope of it to overcome the unnecessary water flow into the agricultural lands.

The system use sensor for real-time to inform watering routines and modify watering schedules to improve efficiency. When used for farming the systems allow for very accurate readings that allow saving up to 13% of the total water commonly required for sprinkling.

This not only results in reduced water use but keeps crops healthier in the long run.

TOUCH LESS WASTE SEGREGATION FROM OPEN SPACE

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Paper proposes a Touchless Waste Segregation From Open Space for segregating waste system for open space which consists of hardware and a software system based on image processing. We implemented a system for collecting and segregating waste with no human interface.

The system is designed with inbuilt sensors to detect and segregate the waste, along with an arm to pick and place the waste into separate bins designed for plastics, glass and metals waste. The hardware system is a trash bin framework based on the core module Raspberry Pi and the software is an image classification algorithm based on a machine learning process. The ultimate aim of the project is to segregate the wastes into three main categories – Plastics, Glass and Metals."

Car Parking System

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The car parking system has become a biggest issue especially in big cities .There are two main reasons firstly the population secondly the security. Moreover the car theft has become an evil haunting driver .In this paper we will provide an extensive management for vehicles including parking facilities and security.

We will be using fpga board .This project deals with an effective way of finding empty spaces and managing the number of vehicles moving in and out in complex multi storeyed parking structures by detecting a vehicle using sensors and thus providing a feedback.

Footstep Power Generation System

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Since time immemorial, human has required and used energy at an alarming rate for livelihood and well-being. It has resulted in depletion and wastage of many energy resources. Today the world is at the brink of utilising all the energy resources. The way in which electricity or energy is produced contributes a large factor of pollution. To overcome this problem a new method has been proposed which is of generating power using footsteps. Walking is the common human activity. When a person walks, their energy of footsteps is applied onthe ground and it goes to waste.

This energy can be utilised as electricity. This idea is more fruitful in densely populated country like India where people prefer more walking than using transportation. This system can be implemented in railways, malls, footpath etc. which are constantly crowded. Implementation of this system is possible with the help of piezoelectric technology. The floor which is designed with piezoelectric technology, can produce electrical energy by pressure which is captured by floor sensors and converted to an electrical charge by piezo transducers.

The objective is to utilise non-conventional power and convert it into electricity. Piezo electric sensor is a device which converts applied pressure into voltage by detecting the person's vibration. So, whenever a person steps on a piezo tile, the pressure from their footstep is converted to a voltage, this voltage can be stored or can be used for various applications. The main goal of this project is to produce a cleaner and more efficient technique of power generation, which will assist to prevent global warming as well as power shortages.

As the need for energy is increasing, people have tried various methods to curb this problem. The "Crowd Farm" setup made by MIT USA students proposed on harnessing the force of human movement, it uses human power as a long-term energy source. In Venice Biennale, a prototype stool that generates power through the passive act of sitting. In this way, we propose a system that produces electricity by human locomotion and can be used for mobile charging. To implement this system we require piezoelectric sensors, rectifiers, charge controller, Microcontroller unit, a rechargeable battery and a charging point. The piezo sensors are arranged in series and parallel connections so that maximum voltage is derived from them. Piezoelectric sensors work on three operational modes such as transverse, longitudinal and shear. So, when pressure is applied, the transducer converts it into voltage. The voltage generated is given to a bridge rectifier for suitable modulation or distortion correction. The bridge rectifier uses four diode that are arrange cleverly to convert AC supply voltage to a DC supply voltage the output signal of such a circuit is always of the same polarity regardless of the polarities of the input AC signals. After the AC will be converted to DC. The charge controller will control the voltage that is being passed to the battery for storage. The charge controller regulates the ampere and voltage that is delivered to the load and any excess power is delivered to the battery system so the batteries maintain their state of charge without getting overcharged. The voltage will now be stored in the rechargeable battery and connected to the battery will be charging point. The microcontroller or Arduino is used to convert analogue data to digital data. The output voltage produced can be displayed on LCD screen with the programming of Arduino.

This is a non-traditional system. It has longer service due to lack of moving components. It uses less components as compared to previous systems. Power is also produced while running or exercising on the step. This system has a wide range of applications including agriculture, home appliances, street lightning and as a source of energy in remote areas.

Design of footstep power generator using piezoelectric sensors; IEEE paper (Aayush Kumar, V.K.Sharma)Footstep Power Generation using Piezoelectric Sensor and distribution using RFID; IRJET paper (Dr.Meena Chavan, Sachin Chauhan, Manvendra Singh, Archie Tripathi)

"ARDUINO BASED LPG GAS MONITORING& AUTOMATIC CYLINDER BOOKING WITH ALERT SYSTEM"

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There is a rapid development in technology which influencing the human life in several aspects due to rapid development in different fields but we still need to adopt that technology such that we can make human life easier to live. In our Country it is not possible to supply LPG through Pipes to each and every home as production of LPG is too short. At present we are having an system Advance LPG cylinder booking through IVRS or online which is most difficult for the illiterate and busy schedule people to book the LPG cylinder in advance. Another Major problem LPG cylinder users facing is "They don't know exactly the status of LPG gas completion" makes even more delay in booking the cylinder which is uncomfortable most of the times. Now a days we are having a IVRS system in which customer needs to go through few steps in accordance with the Automatic voice which also includes selecting options. This project proposes a system that will make entire LPG cylinder booking procedure automated without human intervention. This system continuously measures the weight of the cylinder and once it reaches minimum threshold it will automatically sends message to the authorized LPG Agent so that they can deliver the LPG cylinder in time. Along with the Automated cylinder booking we also designed feature related to the safety of the user in which it continuously monitors the leakage of LPG gas and alerts the user regarding leakage to avoid major accidents which costs human lives mostly.

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This proposed method consists of gas leakage detection system, weight measurement module, microcontroller, GSM module and alert system. The Main platform we are using to build the project is Arduino Mega 2560 which provides us the flexibility to write the code effectively in convenient way and also it will provides us features like Inexpensive, Cross platform, Simpler and clear programming environment, Open source and extensible software, Easy for beginners, The Arduino Mega 2560 is a microcontroller board based on the ATmega2560 The other main component we are using in our project is use of Load cell. A load cell is a transducer that is used to convert a force into electrical signal, which is used to measure of a LPG gas cylinder weight so that we can expect and alert the user with in how many days the cylinder is about to empty. There are different Load cells available in the market with different weight measurement capabilities.

In Arduino Based LPG gas Monitoring & Automatic Cylinder booking with Alert System MQ-4 gas sensor,LM-35 Temperature sensor,10 kg load cell(for prototype) as input devices and Piezoelectric buzzer,16x2 LCD display and GSM module used as output devices.

As we shorted out the problems faced by LPG gas consumers so we come up with some solutions to meet the few requirements of them, as we made our system is completely automate the process of refill booking without human intervention. Our system is also reasoned to help customers to upgrade their safety norms, act in accordingly with minimum requirements on environmental issues and mostly the basic function being prevented by major disasters and protect life and property from reputed Accidents. The primary objective of our project is to measure the gas present in the cylinder when weight of the cylinder is below the fixed load, this can be done using the weight sensors. The gas retailer gets the order for a new cylinder and the house owner (consumer) receives the message regarding the status and the secondary objective is to provideany malfunctionin gas servicing system in order to prevent damage or explosion of LPG. Thus the system developed by us will somehow help the LPG Gas Consumers to lead a comfortable life.

SEWAGE WATER LEVEL MONITORING

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The drainage system is the vital element used to congest wastes from houses and industries. An integral part of any drainage system is the access points into it when it comes to cleaning, clearing and inspection. As metropolitan cities have adopted underground drainage systems it has become a necessity for the municipal corporation to maintain its cleanliness. Maintenance during the recurring blockages in the monsoon is especially crucial. Delay in the removal of these blockages leads to traffic jams, life threatening problems such as road accidents causing harms to everyone around.

The problem arise is the incapability of monitoring the drainage system manually. Sewage is the main concern of today's cities. The skyrocketing population in the cities have made it difficult for the hatches to be placed in a secured area. There is no safe place for the hatches. Thereby giving the reason for the hatches to be in ruins. It is also a problem for the sewage cleaners as they are not able to access the drainage and risk their lives. The delay in maintenance of these sewages lead to contamination of ground water and rising of various infectious diseases.

The topic of our project is Sewage Water Level Monitoring. We intend to design a system which can monitor the level of water from manhole pipe. We know that due to blockage in sewage pipelines the wastewater flows or say overflows through manholes. If we monitor the water level in the pipeline, we can ensure that the manhole we not overflow and hence environmental damage can be avoided. Since wastewater contains many toxic elements which is harmful for all living organism not only humans but plants and animals too, it must be handled with utmost care. Our main aim is to design system which will be versatile, economical and simply configurable which will be able to solve wastewater overflowing issues. The water level data can be used for various purposes for better management of sewage pipeline. Monitoring Sewage water level from remote location is very useful when it is not possible to physically visit the location every time. The system uses a NodeMCU, HC-SR04 Ultrasonic sensor, DHT11 Temperature and Humidity Sensor to do the work. The sensor sends a pair of ultrasonic waves and the waves after hitting the wastewater surface are reflected back towards sensor. The NodeMCU computes the time taken for the journey and also compute the distance. Temperature and Humidity Sensor DHT11 send the temperature and humidity from the data pin to NodeMCU and the output is displayed on serial monitor of Arduino IDE.

Skin Cancer Detection Using Image Processing

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Skin cancer is found most commonly among fair skin. Melanoma is the deadliest type of skin cancer and it has two types: Malignant Melanoma and Benign Melanoma. Melanoma can be cured if it is identified or diagnosed in the early stages and the treatment can be provided early, but if melanoma is identified in the last stages, it is possible that Melanoma can spread deeper into the skin and also can affect other parts of the body, then it becomes very difficult to treat.

Modern imaging techniques and classification models along with increased compute power in our day-to-day machines can now enable us to run large and complex classification models on our everyday computers and even phones. In this paper, we implement a classification model to detect malignant melanoma and benign melanoma.

We used the ISIC dataset which consisted of 3,311 pictures of benign moles and malignant classified moles. After applying a number of pre-processing steps, we fit them into our EfficientNet-b0 CNN model. In our pursuit to optimize results, we used several techniques and an optimizer which finally led us to have an 86% accuracy over a varied test set.

SAFE ROUTES RECOMMENDATION FOR DRIVERS BY REAL-TIME PREDICTION OF ACCIDENT RISK SCORES

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Road accidents are caused by several factors. By taking into account every factor, through efficient planning, management and reforms based on historical data, road crashes and accidents can be predicted and prevented. Various attempts have been made to predict accidents in India but these research studies fall short of accurate predictions because the traditional methods do not consider many accident-causing factors and rely on purely statistical algorithms. Therefore, we propose an accident prediction system which uses Machine Learning on Indian data consisting of individual accident records which will alert drivers and commuters, serving as a safety measureand also help us gain more insights and effectively prevent road accidents in the future.

This system will utilizes the data collected by Mumbai Traffic Police using the DRIVER (Data for Road Incident Visualization, Evaluation and Reporting) software, along with static data of Mumbai roads (provided by Global Partnership on Marine Litter) and historical weather data (obtained from the Meteostat Python Package). The consolidated data is preprocessed using a variety of steps including a unique step to combat class imbalance called Integrated Random Negative Sampling. Negative Sampling is required as the data consists of only accident records and there are no non-accident records. Logistic Regression, Gaussian Naive Bayes, Light Gradient Boosting, Ensemble Stacking and Multi-layer Ensemble Stacking, CatBoost and XGBoost, have been applied to our prepared dataset and a mean accuracy of approximately 85% is obtained. The XGBoost algorithm performs the best and gives the maximum accuracy (86%) among all the models. AUC-ROC curves for the best model, plotted using the OvR (One versus Rest) method for multiclass classification (fatal, injurious and safe), gave an unweighted mean accuracy of 95.1%. It is observed that the features: Latitude, Longitude, Date and Time, Shape Length of a Road, Pressure, Wind speed, Humidity affect the outcome i.e. severity of accident the most. The best model obtained is integrated into a real-time mobile application that provides drivers and road commuters with a percentage accident chance for each road on the user's route. This is made possible using our Road Accident Risk Prediction API developed using FastAPI and deployed on Heroku. This API takes the latitude and longitude input from the mobile application and uses the OpenWeatherMap Weather API to get real-time weather details for the input given. The road information is compared with the static road dataset to obtain the relevant road details for the provided input. Finally, the weather and road details along with the past accident details are fed into the XGBoost model for predicting the accident severity and the probability of an accident occurring. The prediction is then sent back as a response by the API to the mobile application. The application then uses the Google Directions API to display multiple routes from the source to the destinationalong with their average accident chance percentages. The application not only displays the shortest route alternatives but also shows the safest route alternatives.

The proposed system is scalable as upon receiving additional data from City Governments, a model can be developed specifically for that city for road accident prediction. Our end goal is to help people and government bodies by creating a flexible model that helps in accident prevention and saves lives.

Automated Pill Dispenser System

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"Medication adherence by patients has always been a great concern throughout the healthcare industry which includes doctors, healthcare professionals, and other stakeholders mainly because elderly or senior patients have a serious problem with drug misuse. It is very likely for them to forget to take their pills on time, especially patients who take multiple medications concurrently. Also there are chances of under dosage, over dosage and wrong medication. University of Washington conducted a research study on medication adherence in three home healthcare agencies. The study included one hundred forty-seven senior participants taking three or more medications regularly. The results showed that 30.6% participants were under adherent while 18.4% were over adherent with at least one medication. Another recent study of older adult medication self-management found that most errors occurred in the activities of administering the right medications at the proper dose and time (31.8%); following clinical advice regarding medication use (21.7%); and modifying medication use based on clinical advice and self-monitoring (41.9%) A research published by Birmingham University shows that in UK alone, the cost of untaken medicines has been estimated at around £100 million per year According to a survey carried out by patient's safety authority of India, 74% of total death count in the hospital is caused due to overdose or under dosage of the medicines. Clinical analysts reviewed 479 event reports submitted to the Indian Patient Safety Authority from June 2004 through the end of November 2008 that specifically mentioned medication errors resulting from breakdowns in the process of obtaining, documenting, and/or communicating patient weights.

The shocking news from the statistics is that of the 479 reports, 448 (93.5%) represent the five most common medication error event As such, many individuals who require the administering of many doses of medications at specific times have turned to devices such as automatic pill dispensers to alleviate the need for an in-home nurse on a daily basis. These dispensers range in cost from $200 up to $800. Through the use of a simple microprocessor and motor unit an automatic pill dispenser can be produced for a much cheaper price and be much more user friendly. Automated Pill Dispenser is a medical device designed for home usage. The purpose of this machine is to reduce drug errors by automating the dosage process for patients, through the use of visual, and auditory prompts, that tell a patient when, and how much medication should be taken Several health complications arise from non-adherence to medications, which is more prevalent in low-income, less educated families. Most of these families are unable to afford existing medication adherence aids.

This paper reports on the first phase of a program that is aimed at developing low-cost, portable and easy-to-use pill dispenser that addresses the infrastructural and economic challenges of low-income families, especially in developing countries. The major objective is to keep the device simple and cost efficient. The software used is reliable and stable. Elderly population can benefit from this device as it avoids expensive in-home medical care."

Spying and Bomb Disposal Robot

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Our project is designed keeping in mind, the view of the current civil wars, military instability and terrorist scenarios across the globe. Almost every day so many trained people gets either injured or loses their lives while dealing with or trying to defuse bombs. All this can be perceived by the countless number of news articles and documentaries that appears daily on news channels and print media around the world.

We are implementing two applications here, spying and bomb disposal. A camera is attached for spying purpose on the vehicle and a robotic arm made using motors. The vehicle and the robotic arm will be controlled remotely using an IOT app. Also, the camera attached on the vehicle will give the live video feed at the controller end on a mobile. The Wi-Fi device and microcontroller which will receive commands sends by the android application. The system sends commands to the receiving circuit mounted on the vehicle through android application.

The android application involves commands like forward, backward, right and left direction to control the robotic arm. Thus this application for Robotic arm, so that the system can not only be used to enter a high risk area but also to pick, move and place whichever objects it wants to each and every movement of the arm will be recorded and can be viewed in app. Now that there is also a risk of losing internet connectivity at times. So we also have backup control of robot actions i.e. the vehicle and the arm via Zigbee. The purpose of having Zigbee is to provide emergency retreat at times when required.

The vehicle is made of PVC pipes into a close relation of a rocking buggy. This has given vehicle stability on uneven terrain to some extent. For time being we have used Arduino Nano as control board. Separate programs were written for Wfi module and microcontroller, to give freedom to wifi module to connect to required hotspot on its own. We were able to control vehicle with Blynk app over the internet.Zigbee module communication established simultaneously with ESP8266 by using a manual on board switch to avoid loss of data and absolute control over the vehicle as far as vehicle is concerned.

AUTOMATIC VACCUM CLEANER USING ARDIUNO

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"Technology is a never- ending process and designing a product using current technology that will benefit the lives of others is a great contribution to society. This project is about designing and using a floor cleaning robot using Arduino UNO. The aim of this project is to develop and implement a state of the art portable and cost-effective mobile cleaning system. The system consists of the Arduino UNO which is the backbone of the system to operate as required, the brush for cleaning solid particles before washing, the L293D motor driver, the Ultrasonic sensor for calculating the distance between the ultrasonic sensor and the object, the wheels of motion required, Dc motor water, for the purpose of movement, for the purpose of pumping, Transistor switch function, servomotor 1 to move the brush up or down, servomotor 2 to move the mopper up or down . Based on user instructions from the android application developed in the system, Arduino directs the servo motor to make the brush up or down, A floor cleaner robot is very useful for cleaning floors in hospitals, houses, halls, shop, computer center etc.

A simple, portable, modern house capture device that everyone can easily use safely. In general, this floor cleaning robot is very important to our health and reduces the need for human energy. Automatic floor cleaner is an automated machine that facilitates the user to keep their place clean and hygienic. Many industries are working in the automation field to make autonomous cleaners. Now a day's major emphasis is given on the field of robotics for decreasing human efforts. The current market is occupied by cleaners with only one or two functionality. For its cost reduction and simplicity, we are using Arduino. The cleaner will be a step for providing comfortable life by resolving problems in traditional floor cleaning methods At present, there are vacuum cleaners which require humans to handle it. Thus, there is a dire need to implement vacuum cleaner which works without human intervention.

An efficient method to clean the desired area has been implemented through this project. This system has an ultrasonic sensor attached to it, that helps in avoiding large obstacles such as tables, chairs, walls etc. By measuring the distance via this sensor, the car takes the direction where the distance between obstacle and car is more, hence avoiding the collision with the obstacles. The vacuum cleaner is designed with a CPU fan and a pipe is attached to the mouth of the bottle. The entire system is run by batteries. This project will contribute in current scenario like COVID 19 .In this time with precautions cleanliness was also an important asset. With wide availability this can also be used in industries , hospitals, offices, schools and etc."

Design Platform for Customized Washing Machine

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We propose a design for Washing Machine based on FPGA in the following project. Designing on FPGA permits the redesigning of hardware again and again, enabling us to experiment the design time and again. The design is a product for industry engineers to create customized product for users based on their personal wash cycles and wash loads. Also, FPGAs are much suitable for AI applications, this very feature of it enables us to plan for future application of converting this project into a Smart Washing Machine.

This project would equip them with a basic skeleton of the washing machine, that can be modified according to clients and upgraded for smart application, just like designing software does for designers.

Smart Agricultural Crop Monitoring System

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In India Agriculture is the primary occupation and Food is the essential thing for every living being to survive. So, producing a good quality of crops in good environment is always first priority. Nowadays IoT is gaining an important place in research across the world. Smart Agricultural Crop Monitoring system is one of the applications of the IoT. Besides natural disaster and pollution, pests and animal are also one of the major reasons behind the crop damaging. Due to pests and improper fertilization, many times crops get damaged which caused great loss to farmers. While sometimes wild animals destroy the crop by trespassing in the farms.

So, to reduce these damages at some extent, we are making a Smart Agriculture Crop Monitoring system. This system will monitor the entire farm through web cam and detect the pest as well as the animal intrusion reducing the farmer efforts. The captured image of the intruder and of the detected pest will be send to the farmer on telegram channel with a captured image and a text that an “Intruder Detected” / “Pest Detected”. Since the user is also having the access to turn on/off the buzzer as well as the lights around the farm according to their requirements which ensures complete security of farm.

The proposed system is combination of wireless communications and image processing technologies. In our proposed system we are using Hough Transform algorithm for detection of pests. Hough Transform is the feature extraction technique used in image analysis, computer vision, and digital image processing. The purpose of the technique is to find imperfect instances of objects within a leaf of the plant such as black holes on leaf or any insects on the leaf. The disease or insect detected on the leaf of the plant will be encircled and shown to the user.

Smart Entrance System for Covid 19 Prevention

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In this paper we proposed a Smart Entrance System COVID-19 prevention standard operating procedure(SOP) compliance system that counts the number of people entering and leaving a vicinity, ensures physical distancing, monitors body temperature and warns attendees and oxygen level of the body .The system comprises of multiple sensor nodes communicating with a centralized Server. The data stored on the server can be used for compliance auditing, real-time monitoring, and planning purposes. The system does not record the personal information of attendees nor provide contact tracing information.

The paper has been presented which was equipped by various sub-systems including camera mask recognition, temperature sensor, automatic gate, disinfectant spraying box, and disinfectant gate. These sub-systems served to ensure visitors comply with health protocols established by the government and to prevent the spread of COVID-19 in public areas.

VEHICLE ANTI-THEFT IMMOBILISATION SYSTEM

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In today's world, almost everyone owns a car. People are concerned about advanced technologies in the automobile industry since buying a car is such a large expenditure. Today's biggest issue for automobile owners is the continual concern of their vehicles being stolen from a public parking lot or from outside their houses. Duplicates of car keys are easy to create, and employing them raises the danger of thievery. There has been a significant increase in automobile thefts as the number of vehicles on the road has increased. According to Delhi Police personnel, car theft accounts for around 14 percent of all crimes in the city. Even during the first harsh lockdown, which restricted people's movement, between March 15 and 30, 2020, over 83 automobiles (more than three per hour) were stolen in Delhi. To limit the number of thefts, engine immobilizers and sophisticated alarm systems have become standard equipment in many autos. Despite the tough regulations in place and security measures implemented by auto manufacturers and the government, criminals have grown increasingly tech-savvy, discovering a plethora of ways to get access to vehicles. In this document, we propose a new mechanism that would help prevent the car from being stolen.

One of the major applications of Face detection is authentication. Authentication is used for verifying the identity of a user, process, or device, often as a prerequisite to allowing access to resources in an information system. In this current world where technology is growing, day by day and scientific researchers are presenting a new era of discoveries, the need for security is also increasing in all areas. At present, vehicle usage is a basic necessity for everyone. Simultaneously, protecting the vehicle against theft is also very important. Traditional vehicle security systems depend on many sensors and the cost is also high. When the vehicle is stolen, no more response or alternative could be available to help the owner of the vehicle to find it back.

Car security system design and analysis are continually improving as a result of the expansion and use of various Raspberry Pi techniques. Many modern techniques, such as biometric recognition, image processing, communication, and so on, have been integrated into vehicle security systems. At the same time, the number of car accidents, particularly fatalities, remains high. As a result, a practical car security system should be efficient, sturdy, and dependable. Traditional car security systems are expensive and rely on a large number of sensors. When an automobile is truly lost, no further feedback can be useful in assisting people in locating it. Hence, We propose here an advanced security system for vehicles based on facial recognition using raspberry pi for preventing car thefts. It includes a face detection program that authorizes the user and if found unknown, the car is immobilized through a relay circuit in the internal circuitry of the car and along with that, a notification is sent to the user via a mobile application. This system offers additional advanced security features for new generation vehicles like the authorized personnel can also add other users and get the vehicle's location as the GPS (Global Positioning System) module, connected to the Raspberry pi, will store the location information in a real-time database google firebase which will provide the vehicle's location on the mobile application.

MULTI-CHANNEL sEMG SIGNAL ACQUISITION FOR POSTURAL CORRECTION

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Diseases like Degenerative disc disease, Cervical Spondylosis, Pinched Nerve, Cervical herniated disc and general back pain due to bad posture are usually hard to diagnose as they rely on the subjective pain tolerance level of the patients. Being able to quantify such pain, would help the patients as well as the medical professionals in checking the effectiveness of treatments such as acupressure, Ayurveda, electromagnetic field therapy, yoga, etc. Therefore, a portable device can be used by medical practitioners to acquire surface EMG signals.
The currently available products in the market are only able to provide results for one muscle group. Our hardware offers multi-channel acquisition, with which we can visualize multiple muscle groups simultaneously. It is a low power device as it consumes only 3.3V power supply. It has Bluetooth which enables connectivity to device. Also, it is affordable and compact.

After the construction of the hardware, the electrode pads are placed on the target muscles, which are in turn connected to the hardware. The target muscles are given to us by experts from Ramaiah Medical College and Ramaiah Indic Specialty Hospital are Trapezius, SCM sternocleidomastoid, Splenius Capitis. The extension from collarbone to shoulder was used as Common Reference Electrode since it is a bit bony and this is one of the criteria for selecting the reference electrode. The signals generated are amplified using the instrumentation amplifier followed by a band-pass filter, which is tuned between 50-500Hz as EMG signals are in the range of 50-150Hz, which is then passed on to the ESP 32 microcontroller, where these signals are converted to .wav format.Then the signal is sent to a computer via Bluetooth.The signal is visualized on Matlab and feature extraction is performed and a Benchmark Dataset is created. After collecting neck surface EMG signals, we extract 16 distinct features and compute important statistical parameters like Min, Max, Avg and Standard Deviation.The EMG signals are analyzed using a machine learning model (SVM).

With the acquired data, we extracted 16 features like Enhanced mean absolute value, Zeros Crossing, Myopulse Percentage Rate, Willison Amplitude and so on. For these, we computed important statistical Parameters like min, max,avg, etc and used them to classify the patient's muscles as healthy or unhealthy. Treatments such as Acupressure, Ayurveda, Electromagnetic Field Therapy, Yoga, etc. were recommended to help the patient. This device is intended to be used by Practicing Medical Professionals, Physio and Yoga Therapists and for constant monitoring in rehabilitation facilities.

SMART TELE-HEALTH DEVICE FOR VITALS MEASUREMENT AND DIGITAL HEALTH RECORD MAINTENANCE

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Developing countries like India lack quality healthcare services in rural and remote areas thereby curbing accessibility of hospitals and doctor consultation to people living in these areas. It is a known fact that senior citizens and disabled people find it difficult to commute to hospitals for regular check-ups. Therefore, providing real time patient data to doctors and enabling non-contact remote consultancy has become the need of the hour which also proves beneficial at times of pandemics and natural calamities. Developments in biomedical sensor technologies has resulted in more affordable devices that can monitor several vitals and a patient's vital signs are a doorway into his or her health.There is commercially no product to measure all vitals within a single device that can provide real time patient details to doctors thereby necessitating the adoption of separate devices for measuring different vitals that is not affordable by a majority of the population.In order to address these problems, a smart tele-health device with diverse functionalities is proposed that is capable of acquiring health vitals employing numerous sensors such as the MLX90614 infrared sensor for measuring body temperature,INMP441 MEMS Microphone for recording heart rate and pulse rate, HX711 pressure sensor that is coupled with a cuff, valve and an electric pump to measure blood pressure and MAX30100 sensor is used for measuring blood oxygen saturation levels.These health sensors are interfaced to an ESP32 microcontroller with its firmware coded in C++. Patients can record their vitals and upload it on the patient app and this data is then stored on cloud using Firebase as backend. This data can be viewed by doctors remotely. Both the doctor and the patient apps are built using Flutter.

Machine Learning algorithms are employed in the patient app that can predict the possibility of occurrence of ailments based on the recorded health data and also alert the patients of alarming heath abnormalities. Heart Rate Variability (HRV) characteristics are important indicators of cardiovascular health and can also be used to determine stress levels**.**The proposed device provides graphical representation of real time HRV parameters in the patient and the doctor apps for easy visualization of cardiovascular irregularities and provisions for patients to record heartbeats using a MEMS microphone-based stethoscope for effective tracking of heart abnormalities. Another important feature of this device is that it stores patient history both in the doctor app as well as in the patient app ensuring efficient digital heath record maintenance which is beneficial for future consultations along with effective encryption of patient details.

The performance of the proposed smart tele-health deviceis compared with commercially available biomedical devices and it is found to be extremely reliable and at the same time is cost effective along with providing diverse functionalities. The accuracy of the proposed device is found to be greater than 90% based on clinical trials and the cost model reveals it to be extremely affordable to the common masses. The proposed device is user friendly, portable and is designed to make quality healthcare facilities available to all. As a part of future advancements, a 3D printed enclosure and a custom PCB will be implemented to make the device more compact. Acoustic breathing sensors will be interfaced as an add-on in order to trace breathing patterns of patients and predict the possibility of breathing ailments. An inventory of medicines will also be kept in the app enabling quick and effective delivery of medicines to the patients.

HOLOGRAPHIC AR SIMULATION FOR HEALTHCARE SYSTEM

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AR holographic projection has the ability to give us a more elaborative prospective and information. Healthcare system can have a single interface for the various equipment's involved in monitoring. It can facilitate the medical students in their learning process of human body, organs and surgical operations. Overall, it can help to reduce the cost and time in healthcare and act as an effective aid in solving problems in health industry.Augmented reality (AR) describes digital experiences where virtual content, such as 2D or 3D graphics, is blended with and aligned to the real world. In that sense, AR extends, enhances, or augments a user's view of the real world. When an app superimposes that content on a live camera image, the user experiences augmented reality: the illusion that virtual elements exist as part of the real world.

We used Marker based tracking which is one of type of Vision based tracking. Most of the AR tracking techniques needs costly devices. The marker-based tracking is based on the mobile phone technology where the camera is the only source for tracking. Which helps to maintain the budget or to keep the application and setup simple. Environments that are identical, with reflective surfaces or have repetitive features are difficult to bifurcate and, in such circumstances, marker less tracking becomes very unpredictable. Besides, a dynamic environment is even more difficult to track as the locations of the features vary.A tracking system can avoid some of these problems by attaching markers in this kind of environment.

The product will be Headset with semi-reflective screen and mobile slot to place mobile and take its reflection on screen. Mobile device will have marker-based AR application. One can store different markers and AR scanned models. Doctors can add reports of individual patient at one marker. There will also be video calling option.

LEVEL 4 INDUSTRIAL AUTOMATION FOR SMALL-SCALE INDUSTRIES

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The five levels of working in an industry, from 0 to 4 are the shop floor, control field equipment, SCADA (Supervisory Control and Data Acquisition), Planning and ERP (Enterprise Resource Planning) respectively. The three levels from shop floor to SCADA are interconnected and Planning and ERP are linked. Industry 4.0 aims at establishing a link between these two sets of levels. Though, Industry 4.0 is a promising advancement, its implementation is difficult due to the high initial set-up cost and intricacy of the software used. Our proposed solution is to create a user-friendly approach for implementation of this idea for small scale industries using bottle-filling plant as a prototype. In order to achieve this, we have focused on using simpler software such as MS Excel, MySQL, InTouch and basic programming languages such as HTML5 as well as PHP. The idea behind using these software is their ease of operation, ease of learning and availability of free, quality online material. Through this we hope to achieve the implementation of Industry 4.0 in greater numbers even in small scale industries.

This project exhibits Level 4 Industrial Automation using the example of a bottle filling plant. The different levels of working in the industry are being demonstrated with the help of a hardware model and different software. ERP (Enterprise Resource Planning) consists of a database with various tables such as Materials, Sales Order, Plan Order, Production Order, etc. When an order is placed, a sales order is created. On the release of the sales order, a plan order is created. Based on these the Planning Level schedules the production orders and assigns priorities. SCADA receives this production order number and initiates the process accordingly. It also provides corresponding inputs to the control level which in turn controls the working of machinery on the shop floor. Simultaneously, SCADA takes feedback from the hardware components so as to achieve real-time simulation.

Industry 4.0 is at a very early age. It was launched at the beginning of 2010 officially. Within only a few years, many visionaries have begun to discuss Industry 5.0. Industry 4.0 is moving towards intelligent mass production. Industry 4.0 is more effective because it offers efficient and faster processes for production through which higher quality goods at reduced costs can be obtained. The proposed solution enables even small-scale industries to implement the concept of Level 4 Industrial Automation. This solution strongly recommends implementation of Industry 4.0 due to its significant advantages such as reduction in production cost, lesser time-to-market as well as improved customer responsiveness.

Digitization will have a permanent effect on our living and working environment. Hence, the future scope lies in the concept of Industrial Automation 5.0. Industry 5.0 is the transformation that combines output means and efficiency and finds ways to communicate between man and machine. The term Industry 5.0 has been introduced to the research areas which are considered as the next industrial revolution as it will include latest technology trends such Human Robot Coordination as well as using Renewable Energy resources (Solar Energy). In addition to mass production, Industry 4.0 also focuses on sustainability.

Smart Door Entry System During Covid Times

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The COVID 19 pandemic is producing a worldwide health crisis. Wearing a face mask in public places and wherever else is the most effective safety gear. The COVID 19 outbreak compelled governments all over the world to enact lockdowns in order to stop the virus from spreading. Wearing a face mask in public areas, according to study results, greatly minimizes the chance of transmission. This study describes a smart door that monitors body temperature and detects face masks using a machine learning model.

To accomplish this, we'll utilize sensors to identify whether the individual in front of you is wearing a mask properly. The MLX90614 an infrared thermometer is used to detect a person's body temperature, and the 5MP PiCam is used to determine whether the individual is wearing a mask properly. On the 16*2 LCD Display, we show the body temperature and confirmation of the face mask. Any commercial malls, hotels, or apartment entry can benefit from the proposed approach. As a result, a cost-effective and dependable approach of utilizing AI and sensors to create a healthy atmosphere has been developed.

The Face Mask Detection technique, which is implemented in the TensorFlow software library, is used to evaluate the proposed framework. A non-contact temperature sensor is also used to measure the individual's body temperature. This proposed system could determine whether a person is fit to enter public locations or not by enabling technology.

We proposed a Smart Door Entry System During Covid Times for Monitoring facemask and Measuring temperature. This system can be used at every public place entrance like malls, hospitals, theaters, supermarkets, and colleges. The system is operated by the microprocessor which is raspberry pi 3b+ on which image processing is done, Camera is used to capture the live feed after capturing the live feed MLX90614 measures the temperature of the Person and then displays on the 16*2 LCD Display. With this system, the manual monitoring of the face mask and temperature is removed and its contactless also.

Thermal Image Processing for Breast Anomaly Detection

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Medical imaging is a concept that covers a broad range of techniques and processes used in healthcare technology to create visual representations of the interior of the human body for diagnostic and therapeutic purposes. The term "Medical Imaging" consists of a wide range of radiological imaging methods.

Among several medical imaging techniques, Digital Infrared Thermal Imaging, also known as medical thermal imaging, is an important procedure for alerting clinicians to do modifications that could indicate the early stages of cancer and other anomalies, which is critical for patients. Digital Infrared Thermal Imaging is a non-invasive imaging approach that uses thermal imaging sensors to capture thermal data.

Machine learning coupled with thermography for disease identification has become increasingly popular in recent years. This is due to its ability to quickly recognize a range of trends and patterns, the least human involvement is needed, the continual scope for progress, and its ability to handle multi-dimensional data with ease. Since Machine Learning is commonly used to diagnose and even predict deadly diseases, it is very well suited for clinical applications.

For categorizing medical images or processing any metric for a specific image area, the machine learning algorithm framework recognizes the optimal combination of features of medical image. After that, algorithms like Support Vector Machines, Neural Networks, and Deep Learning approaches are usually applied to process the photos.Our goal is to create an automatic breast cancer diagnosis model that employs image processing techniques and a machine-learning algorithm to evaluate thermal breast images and detect illness symptoms, enabling early detection of breast cancer.

We employed Support Vector Machines to detect anomalies in thermal pictures in this work. A collection of thermal pictures from people with normal and abnormal breasts is used. We employ the Canny edge detection technique for edge detection, which is simply a series of stages. It is a multi-stage algorithm:

1. Noise Reduction
2. Finding Intensity Gradient of the Image
3. Non-maximum Suppression
4. Hysteresis Thresholding

We resize the image by a factor of 10 and we get a feature matrix (image matrix having the edges highlighted). The matrix is then flattened into one large vector and each of the elements of the vector is a feature. We use the flattened vectors corresponding to each image as our input on which the model is to be trained. We assign labels for each of the images 0 for abnormal and 1 for normal. By maximizing the distance between sample points and the hyperplane, the Support Vectors Classifier tries to find the optimal hyperplane for separating the different classes. Our model design is based on grid search on data before fitting it for prediction which enhances the performance. For the thermal images in the dataset, we achieved a 90% accuracy rate using our suggested approach.

Shaping Lives With AI-Enabled Metaverse

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The massive growth of technologies has paced up everyday living. Our work styles, personal lifestyles and social development have grown immensely in the last few decades. With absolute new tech giants coming up with automated solutions, working remotely has been an easier task. And now, with all of the scientific and automation developments, Metaverse is the most significant trend and tech. Metaverse, a term composed of a combination of meta and universe, has been introduced since the 5th generation network as a shared virtual world utilizing many new technologies such as virtual reality and artificial intelligence (AI). And ever since the famous social media platform Facebook rebranded itself as Meta, the buzz around the term couldn't keep calm. The Metaverse is a network of 3d virtual worlds primarily focused on social connections in the broadest terms. The Metaverse is often described as an iteration of the internet as a single entity in future fiction. Among several technologies, AI shows how important it is to process big data to enhance the immersive experience and deliver human-like intelligence for virtual agents. Metaverse's AI research and usage include content analysis, supervised speech processing, computer vision, etc. Some of the ways AI powers the Metaverse are by aiding in assembling avatars, making human replicas(digital humans), language processing, learning the data, intuitive interfacing, etc. While the Metaverse promises some exciting aspects for our society, there are also many challenges and risks of privacy, cyber-attacks, ownership, user transparency, accountability and regulations in launching it. With adamant information available on the net, it becomes challenging to gather the proper knowledge. Hence, intending to enlighten the intelligence of the Metaverse, this paper guides readers with adamant facts and data about the Metaverse. It seeks to explore the role of AI in the creation and evolution of the Metaverse. Next, we will examine some AI-powered applications such as healthcare, manufacturing, smart cities, and games deployed in the virtual world. To support information with the facts and figures, a survey of 100 internet users with their knowledge about metaverse technology has been conducted. The survey consisted of questions testing users' knowledge about Metaverse, AI technology and its abundance in the real world. The survey's target audience was university studying students, educators, and working individuals. This survey has been a worthwhile effort to explore the role of AI & knowledge about Metaverse amongst future generations. After deeply analyzing the result, it was concluded that there needs to be a great learning resource accessible to everyone. This paper is a comprehensive investigation of AI-based methods covering various technical aspects possessing potential for the Metaverse. This paper will serve as informative content for readers to edify metaverse culture, its background, the technology supporting Metaverse, and the challenges and advantages of using Metaverse. Hence we finally conclude the critical contribution of the assisted survey and knowledge facts to be spread amongst the community. This paper will help researchers in the future to discover key directions & get a deep background for the Metaverse & AI.

A Comparative Study of Supervised and Reinforcement Learning Techniques for the Application of Credit Defaulters

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Credit Defaulters in Banking is a term used for account holders unable to repay financial loans in time. In the past, credit and loan systems were human dependent and had limitations in identifying defaulters due to weak data monitoring. Today, in the era of Data Mining and Machine Learning (ML), data is closely monitored with inferences and timely feedback. The data available for credit defaulters is usually heavily imbalanced i.e. the number of defaulter class observations is very few in comparison to the non-defaulter class observations. The objective of our project is to use a technique named 'Reinforcement Learning' (RL) to mitigate this bias using the concept of reward feedback wherein current decisions influence future decisions.We aim to do a comparative study of the Double Deep Q-Network (DDQN) algorithm under RL with the existing supervised learning algorithms like SVM, KNN, Random Forest and XG Booston the Taiwanese UCI dataset on credit defaults and theBerka (Czech) dataset and find out if RL is suitable for the task.

Reinforcement learning is the learning of how to map situations to actions so as to maximize a numerical reward signalas given in Sutton et al., 1998. In a classification problem, Reinforcement Learning is considered as a guessing game. In order to nullify the bias towards the majority class, the correct classification of the minority (target) class is given the highest positive rewardin Lin, E. et al.,2020. The deep Q-learning algorithm of RL has a tendency to overestimate action values under certain conditions. To resolve this, double deep Q-learning is proposed in van Hasselt et al., 2016.

Various experimentation is conducted on the DDQN model of RL and it is observed that the discount factor and exploration rate are two hyperparameters which affected the rewards and Q-function. This seems to influence the results. The Gmean, F1-score, Precision, Recall and ROC-AUC of both the DDQN and the supervised learning algorithms are calculated and compared.

From the supervised learning techniques, KNN performs the best on the given datasets. When it comes to RL techniques, it seems that the discount factor has been influential in improving performance for the Berka dataset. For the Taiwanese dataset, the performance is not up to the mark irrespective of the value of the discount factor.These observations lead us to conclude that RL techniques, stand-alone, are suitable for specific datasets, and their performance is at par with supervised learning for such cases. We attribute these conclusions to the lack of sufficiently diverse datasets, which could have providedmore insights into the data.

Multilevel Authentication System using Artificial Intelligence

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In today's world, the need for an advanced authentication system with image recognition, liveness detection, and speaker recognition is one of the most important requirements in biometric security and surveillance systems, and this is the basic idea behind our project model, in an attempt to eliminate improper authentications and identity frauds, thereby increasing the security system's efficiency.

Another benefit of this method is that it eliminates the need for physical presence for authentication, making the entire process more efficient and effective. An upgraded model of Machine Learning and Deep Learning (ML and DL) in authentication for boosting recognition would be the key to constructing such a smart system. This advanced model would combine the use of a neural network to determine the subject's liveness, feature matching, and speaker recognition utilizing Artificial Intelligence, which includes Machine Learning and Deep Learning.

The live detection feature, as well as the presence of a database, is a unique feature that this project model seeks to give. This project's multilevel authentication method is far more advanced than previous technologies, making it a non-invasive and efficient system that ensures public security and safety. On our validation set, this study achieves 100% liveness detection accuracy with little overfitting and 99.3% face recognition accuracy.

Animal Detection Using Deep Learning

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Identification of rural problem was done by doing a survey in the rural areas of Gujarat. There was a major problem due to animals. They damage the crops due to which farmers go through a big loss. Farmers tried to prevent them by using fences and zatka machine which costs them more, still animals break those fences and also jump off from them.

The farmers also have sleepless nights guarding their farm. Efficient and reliable monitoring of animals is essential.

This aim of project is to develop an algorithm to detect the animals in and around farms which vandalize the farms since manually monitoring for such animals in farm all day and night is difficult for farmers. Deep neural networks are the collection of algorithms that have placed new records in precision for several vital problems. Convolutional neural network (CNN) is a type of deep neural networks, most generally applied for investigating visual images. This algorithm will classify animals from video footage of farm so we can monitor them more efficiently.

Animal detection and classification can also help to prevent animal-vehicle accidents, trace animals and reduce loss. This can be achieved by applying effective Convolutional neural network and Image processing techniques. This CNN model is inspired by ResNet model Libraries like Tensorflow, Keras and Image AI can be used for this work.

Machine learning for identifying B measons

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The Standard Model is the most acclaimed theory that describes three of the universe's four fundamental forces and provides the relationship between the universe's basic particles and these forces. The constituent particles (building blocks) of matter are divided into two types quarks and leptons with both these groups containing six particles which are related in pairs or generations. The six quarks are paired in three generations with the up quark and the down quark in the first generation followed by the charm quark and the strange quark in the second generation and the top quark and the bottom quark in the third generation.

The following document explains how to determine bottom quark with the help of a machine learning model. The task of identifying jets that contain bottom quarks and separating them from jets is of particular significance due to prominence of b quarks in physics processes and to the abundant background light flavored jet production at hadron colliders such as LHC.

This task, commonly referred to as b- tagging is broadly applied to both precise standard model measurements and searches for signature of physics phenomenon. When collision takes place, particles are released. The particles which are worked upon are quarks.

The particles released can be a top quark or a bottom quark. So this displays a designing machine learning model to detect bottom quarks . The Standard Model explain how the basic building blocks of matter interact, governed by four fundamental forces and classifies all the subatomic particles known.

Identifying bottom quarks helps to identify the decays of particles. The combination of high mass and low transition rate gives experimental collision byproducts containing a bottom quark a distinctive signature that makes them relatively easy to identify using a technique called "B-tagging". For that reason, mesons containing the bottom quark are exceptionally long- lived for their mass, and are the easiest particles to use to investigate CP violation. For the project, data we need is generated by PYTHIA, PYTHIA is a program for the generation of high-energy physics collision events, i.e. for the description of collisions at high energies between electrons, protons, photons and heavy nuclei. The Machine Learning model used here is Neural Network.

In the work, we have identified bottom quark from different , particles which includes charm, light and light quarks(up, down, strange) using neural network. From the results we conclude that the most accurate model is of b vs light because the difference between the values of the features (12features considered) is high, since the other particles considered have values near bottom quarks , the give less accuracy.

Tagging boosted hadronically decaying top quark by Machine Learning

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The Standard Model is the most acclaimed theory that describes three of the universe's four fundamental forces and provides the relationship between the universe's basic particles and these forces. The constituent particles (building blocks) of matter are divided into two types quarks and leptons with both these groups containing six particles which are related in pairs or generations. The six quarks are paired in three generations with the up quark and the down quark in the first generation followed by the charm quark and the strange quark in the second generation and the top quark and the bottom quark in the third generation. The top quark is the heaviest particle in the standard model. The top quark also has a very short lifetime and decays instantly which makes its detection an interesting area of study. The detection of top quark has been one of the exciting areas of research at the CMS and ATLAS detectors in CERN.

The Large Hadron Collider (LHC) is the most powerful and largest particle accelerator in the world. For the purpose of generating the collision data the project uses MadGraph5, a Monte Carlo event generator that is used to simulate events at the LHC and Pythia, a program for generating high-energy physics collision events. The energy from the decay pattern in the generated data was observed and it was discovered that random energy spikes seen by the simulator's CMS detector must be filtered out. This was accomplished by tracing the energy levels down to the two constituent particles who collided in the first place. On the energy-eta-phi feature space, a radial threshold distance is used to do this. The idea is that the decayed energy level should be close to the energy of colliding particles, which is represented by the two greatest energies in a given event. If the radial distance between an energy level and the maximum energy in a collision related to a colliding particle is more than the threshold, the data is filtered out and the rest is used to train the machine learning model. A number of machine learning models like Convolutional Neural Network, Gaussian Boosted Decision Tree, Decision Tree, Random Forest, AdaBoost, k-nearest neighbor algorithm, XGBoost were trained with the aim of finding out the machine learning model that delivers the maximum accuracy in distinguishing the boosted top quark signal from the QCD background. The ROC curves for these models were generated and it was observed that the CNN model with an AUC score of 0.940 offers the best results.

In recent times, particle physics phenomenology has become a multidisciplinary field reflecting the amalgamation of physics and machine learning. In the work presented in the paper we demonstrate the use of machine learning to identify boosted top quarks using the jet substructure. In future, we look forward to improving the accuracy of the model by incorporating additional features of the top quark.

Real-Time Sign Language Recognition System

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Sign language using hand gestures is developed for deaf community, which can be used as a means of communication between friends and families of deaf people and the deaf people. Sign Language Recognition is one of the most growing fields of research today as well as challenging too. There are Many new techniques that have been developed recently in this field. In this project , we are going to develop a system for conversion of sign language to text using OpenCV.MediaPipe Hands is a high-fidelity hand and finger tracking solution. It employs machine learning (ML) to infer 21 3D landmarks of a hand from just a single frame.The goal of this project was to build a neural network able to classify which letter of the American Sign Language (ASL) alphabet is being signed, given an image of a signing hand. This project is a first step towards building a possible sign language translator, Vision Based Approach-This approach takes images from the camera as data of gesture. The vision based method mainly concentrates on captured images of gestures and extract the main feature and recognizes it.

All the work that we need to do can be split in 5 steps :
1. Generate and Prepare the Data
2. Extract The 21 Key points of Hand using Mediapipe and write this Landmarks in dataset.csv file using Panda
3. Train The Model with this files
4. Test the Model (KNN)
5. Predict with Model here we will get our output.

K-nearest neighbors (KNN) algorithm uses ‘feature similarity’ to predict the values of new data points which further means that the new data point will be assigned a value based on how closely it matches the points in the training set.

We can understand its working with the help of following steps –
Step 1 − For implementing any algorithm, we need a dataset. So during the first step of KNN, we must load the training as well as test data.
Step 2 − Next, we need to choose the value of K i.e. the nearest data points. K can be any integer.
Step 3 − For each point in the test data do the following − The data we collected had 21 landmarks on it by using mediapipe, by x-y-z co-ordinate. These quardinate values have been stored in a CSV file for a single aplhabet and we labeled it. Hence we created individual csv file for every alphabets, which contains the positions of 21 points on palm. Then all these CSV file has been combined to a single CSV file i.e (combined_CSV).The final script has been run in the folder where the combined CSV has stored. This Script compares the live stream 21 points created on screeen with the data we collected with 21 points and predict the alphabet. For more accuracy we kept the counter of 10.A single action will be confirmed 10 times ,if out of 10 maximum time the same alphabet got predicted will be shown in the output. So further we are trying to convert the predicted alphabet to audio.

Face recognition based smart attendance system

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In this digital period, face recognition system plays a vital part in nearly every sector. Face recognition is one of the substantially used biometrics. It can used for security, authentication, identification, and has got numerous further advantages. it's being extensively used due to its contactless and non-invasive process. Systems are not dependent on a few facial features but they are highly robust and identify a face on several data points. Therefore, these systems can screen for face masks and identify people without removing the mask or any change of facial attributes like beard, specs etc. It is a major advantage over any other biometric system .The traditional attendance tracking method includes punch locks or some other sort of manual system and this method requires consistent human supervision. But fortunately, the evolving technology has led to the introduction of the automated attendance system that provides much better results. Likewise, face recognition system can also be used for attendance marking in seminaries, sodalities, services, etc.

This system aims to make a class attendance system which uses the conception of face recognition as being primer attendance system is time consuming and clumsy to maintain. And there may be chances of deputy attendance. This system also provides authentication using recognition of face of the admin or teacher to unlock as there are chances of trespassing by the third party. So this rises the security of the system. Therefore, the need for this system increases. This system consists of four phases-database creation, face discovery, face recognition, attendance updation. Everytime the attendance get mark the database will get stored along with the time and person details. Database is created by the images of the scholars in class. then the frames of the videotape is getting converted into images, so that the face of the pupil can be fluently honored for their attendance so that the attendance database can be fluently reflected automatically.

Face discovery and recognition is performed using Haar-Cascade classifier and Original Binary Pattern Histogram algorithm independently. The matching a human face from a digital image or a video frame against a database of faces, typically employed to authenticate users through ID verification services, works by pinpointing and measuring facial features from a given image. Some algorithm also work by comparing database or extraction facial features like shape of eyes, nose, relavitive position, cheekbone etc. Face recognition system has the input in a form of an image or a video stream and the output in a form of identification or verification of the subject that appear in the image or video. Technology has developed by Artificial Intelligence lab, which can recognize faces with up to 97.3% accuracy, which are 2.7 less accurate than humans. Facial recognition is something weve evolved to do. Hence AI identification endeavor to mimic this manner of human.So building a face recognition based attendance system which can manage the records of the students will be more efficient, advantageous also secured. Our smart face recognition solution works on a no-touch technology and that improves security and safety.

AI IN SURVEILLANCE

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This era is called to be Artificial intelligence (AI) and Internet of Things (IoT), Data Science (DS) it is operated by robots and they have replaced the human. This article we mention the Artificial Intelligence for CCTV Cameras and Video Surveillance. There has never been a better time to protect your property with CCTV; modern innovations have allowed security camera companies to create high-definition, fully manoeuvrable, internet-connecting cameras that provide their operators with an even wider range of flexibility than ever before. The A.I. program functions by using machine vision. Machine vision is a series of algorithms, or mathematical procedures, which work like a flow-chart or series of questions to compare the object seen with hundreds of thousands of stored reference images of humans in different postures, angles, positions and movements.Many state that, the United States is one of the most surveilled countries, but India is still a developing country with almost improper security-based systems. AI CCTV cameras are network IP cameras that deliver advanced analytical functions like vehicle detection, face detection, person detection, people counting, traffic counting and license plate recognition.

Our vision is to implement AI integrated surveillance using AI CCTV which has an integrated 3D face model scrutinization that handles the images at any markable angle and large pose invariance. The Indian government and the Indian Police department will be the most benefitted through this idea because AI integrated CCTV fed with database of the people will be useful in identifying or tracking of any individual easily, which will be useful in the case of crimes and illegal activities by the individuals.

The methodologies we use include Scrutinization of face models and Video Content Analytics commonly known as VCA. Scrutinization of face models is implemented as follows, Three-dimensional (3D) face models can handle large pose face recognition problem. By scrutinizing study depth, here we only analysis on pose invariant technique in face recognition method is able to handle self-occlusion and deformation, both of which are challenging problems in two-dimensional (2D) face recognition.Texture images of the face in the database can be the same view as the probe during surveillance. Depth information has improved the performance of face recognition with large pose variations up to the mark able angle and under even more challenging conditions. VCA is implemented as follows, Objective of VCA software is to analyze the video stream, one frame at a time, and create a structured database of information out of the unstructured video data. The VCA engine accepts the raw video stream and converts it to a comprehensible format. It then processes the same using computer vision & deep learning technology.

Additional benefits of our ideology include, it can be used to monitor closed spaces like malls, stadiums, organizations and so on where lots of people are present and normal surveillance is not that effective.
AI surveillance makes it easy in this case for the authorities to monitor mass gatherings using AI integrated CCTV.

Transcription Of Text

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Transcription of Textis a model that takes a computerized file, identifies the text content from it and converts it into editable format. Feature text recognition, extraction and conversion are the primary components of the Text Transcription system. This provides more ways to engage with the information. It helps users better understand dialects, pronunciation, and overall content without losing focus. Our model will be useful to any user and for special abled people of the society. Transcription of text keeps a place in many fields and many applications of our day-to-day life. The Transcription of text can be an extremely useful application in healthcare, education and personal use also. Two important techniques that were used to obtain the required output are Optical Character Recognition (OCR) and Google Text to Speech. (gTTS) systems. Optical Character Recognition is a Python package that allows us to do Text Recognition with ease. Adding to it, Text to speech or TTS is more of assistive technology. Text-to-speech (TTS) systems convert written text into speech signals. The OCR based architecture was used to segment, recognize text, and take the text ahead for processing. It was then followed by a gTTS system which converted the text into the desired speech output. The process was upgraded by enabling the translation option using google translator. Along with this handwritten text has evolved, as evidenced by the different types of handwritten characters such as digit and numeral in English. It is a two-way system which also does the conversion of speech to text. This model envisages improving word recognition, increases the ability to pay attention and remember information while reading, and allows users to focus on comprehension instead of sounding out words. It also helps increase kids' staying power for reading assignments, helps kids recognize and fix errors in their own writing, and like audiobooks. Transcription of text has its application in uncountable processes, and is evolving as a very important part in many sectors.

DEEP LEARNING APPROACH FOR DISTRACTED DRIVER IDENTIFICATION

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Driving a car requires continuous attention to road and traffic circumstances and vehicle control. Many times drivers didn't pay sufficient attention to driving because they are occupied with other activities such as listening to the radio, making a phone call, talking with a passenger, or eating while driving which overall increases there
risks for accidents. The number of road accidents is increasing at a tremendous rate and the distraction of drivers is one of the root cause for it. There are drivers of all the ages who continue to engage in distracting behaviors despite their self-reported awareness or perceptions of the associated dangers and their increased crash risk.
It's a big challenge for the safety transportation system to reduce the number of distracted drivers. One can over come this problem by developing a system that automatically detects, tracks, and reports distracted drivers to indirectly avoid accidents. There are many models already exists were distracted driving were identified, but these were focused mainly on mobile phone use. Here we tried to broader our perspective by taking into consideration distracted driving behaviors that are not limited to mobile phone use. In this paper, we present a deep learning approach that is used to detect distracted driving behavior. The images captured from the camera will be preprocessed by the data augmentation techniques which are then fed to the convolution neural network for classification. Various models were trained and tested and their results are compared out of which VGG-16gives the best accuracy of 92.59% on the training dataset and 97.65% on the validation dataset. The approach was also tested on the indigenous real time dataset and accuracy is found to be 74.00%.

For testing and training of deep learning models the dataset of images is required. One can create its own custom dataset by capturing the images from the camera module. There are various approaches for the positions and setup of cameras within and outside of the car. The camera could be placed in the top corner to capture the posture and facial expression while the camera can also be set up in such a manner to focus more on upper body parts and hand positions. The data frames obtained from these cameras are processed by some image pre-processing algorithms. The images captured from various sources need to be reshaped and resized. Some Data augmentation techniques could be opted which includes shearing, skewing and flipping of images. Along with these some saturation, contrast and brightness parts of the image also need to be modified. Some smoothing techniques will be used to remove unwanted noise from the images and to enhance image structures. Once the images are preprocessed they are loaded in the models. Various models like VGG-16, AlexNet, ResNet, were trained and their performance was tested and evaluated, same models were also tested on the real-time indigenous dataset. The accuracies of the models were increased by changing the increasing learning rate, changing the optimizers, and increasing the number of epochs. The sequential models give the highest accuracy of 95.32% but didn't perform well on the real-time dataset so we carried our testing with VGG-16 of target size 200 X 280 which has given the decent accuracy over real-time dataset.

Mood Analyzer

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We all know that it's difficult to communicate with the customers as we cannot communicate with each customer individually and understand how they are feeling, or what they expect from us. Many times when there is a huge queue in the bank due to shortage of staff, the customers can get irritated causing a customer to be unsatisfied. And customer satisfaction is of utmost importance to us, that is why we want them to have the best experience possible with us.

We can satisfy all customers by understanding their needs and their mood and providing them with what they need. This can be done if we understand their facial expressions, tone of voice, tone of text and their overall behavior. We will be using algorithms and libraries like OpenCV, CNN, MNB, Speech recognition, and Voice modulation. We can detect these things separately using different algorithms and then combine the results and use that information along with what they are asking for and provide a good solution and a good experience to everyone.

In any business, emotion recognition is a critical factor to consider. It becomes much easier to handle or manage customers if we can somehow quantify or predict their moods. Human emotions are mainly derived from three main factors: facial expressions, speaking manner, and handwritten text. This can be automated using machine learning methods such as speech recognition and image processing. Emotion recognition means observing a range of emotions in real-time and accurately predicting their mood based on the customer's behavioral responses such as his facial expressions and his speech patterns. It should be able to detect moods such as angry, happy, or distressed.

Algorithmic Trading using Technical Indicators

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The stock market facilitates the two activities of trading and investing. Traders as opposed to investors try to capitalize on variations in the prices of the stocks. Trading as a discipline has evolved over time and changed drastically with the onset of computers and computing technology. Technical analysis is a method using which traders can identify trading opportunities through price changes and patterns.
Algorithmic trading helps overcome the challenges associated with traditional trading and also eliminates the element of emotion from trading.

The reason for having used technical indicators is that Technical indicators can be easily computed from the OHLC data of the stocks and even by only Using technical indicators we can create simple yet effective trading strategies.The application of MACD, EMA and RSI. MACD and EMA was studied because they are two of the most popular lagging indicators and we RSI because it is one of the most popular leading indicators.

The data obtained was prepared and resampled.The strategies were back tested in 15 mins and 1 Hour candlesticks because these time frames are best for swing trading strategies. TaLib, a Technical Analysis library in python, was used for the computation of the values of the technical indicators.The behavior of these indicators has been analyzed on a basket of 20 stocks over a period 3 years. Stop loss was set separately at different points to find an optimal stoploss.

In our research we have learnt how strategies using purely these indicators perform in bullish,bearish and sideways markets. Single indicator strategies and combination strategies have been tested to see what works best in different market conditions. The net profit/loss of the stocks using the various strategies and their performance as compared to the buy and hold in the same period are the result of this project.

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TIMELY APPROACH FOR ACID TRANSACTIONS IN DBMS

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Developing database applications with timeliness requirements is a very difficult problem as current database technology does not provide programming support to help engineers and programmers in dealing with timing issues. Nevertheless, real database applications very often have to cope with the possible occurrence of timing failures, when the operations specified in a transaction do not complete within the expected deadlines. Without adequate support to help designers and programmers to solve timing requirements, the development of database applications with time constraints is a very complex task.

The notion of time is completely absent from the classical DBMS transaction model, which is based on the ACID properties (Atomicity, Consistency, Isolation, and Durability) On time data management is becoming a key difficulty faced by organizations. In spite of the importance of timeliness requirements in database applications, commercial DBMS do not assure the detection of the cases when a transaction takes longer than the expected/desired time. This paper discusses the problem of timing failure detection in database applications and proposes a transaction programming approach to help developers in programming database applications with time constraints

CHAT ANALYZER

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Messaging Apps has been the most popular and effective form of communication in recent years. Messaging Apps chats are a collection of several types of conversations that take place among a group of individuals. This conversation covers a wide range of subjects. Our programme seeks to provide a thorough examination of the data provided by the Chats. Regardless of the topic of the discussion, our generated code can be used to gain a deeper comprehension of the data.

The benefit of this tool is that it is constructed using simple python modules such as pandas, matplotlib, seaborn, and re, which are used to create data frames and plot various graphs, which are then presented in the web application, which is an efficient and resource-light approach, therefore it can be easily applied to largest dataset. This system will provide in-depth analysis of the WhatsApp chats. This tool enable visualization using various plots showing the most used words, emoji, no of active hours of the participants in the chat.

We aim to build a program where the data analysis of all the users in a whatsapp group can be done. By just uploading the group chat file, the admin will be able to analyse the data. The admin would be able to see the activity in the whatsapp group of all the users present in the particular group.

The different features we aim to provide are an user's average response time, peak active hour of the day, average words used, how frequently he/she responds, most emoticons used by the user and many more. This will be a boon for the corporate and educational group admins as they will be able to analyse the activity of all the user's in a particular group.

Attendance Management System

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Attendance management is important to every single organization; it can decide whether or not an organization such as educational institutions, public or private sectors will be successful in the future. Organizations will have to keep a track of people within the organization such as employees and students to maximize their performance. Managing student attendance during lecture periods has become a difficult challenge.

The ability to compute the attendance percentage becomes a major task as manual computation produces errors, and wastes a lot of time. For the stated reason, an efficient Web-based application for attendance management system is designed to track student's activity in the class. This application takes attendance electronically and the records of the attendance are stored in a database. JavaScript is adding to the application to improve the use of the system. SQL lite used for the Application Database.

The system is designed in a way that can differentiate the hours of theoretical and practical lessons since the rate of them is different for calculating the percentages of the students' absence. Insertions, deletions, and changes of data in the system can do straightforward via the designed GUI without interacting with the tables. Different presentations of information are obtainable from the system. The test case of the system exposed that the system is working enormously and is ready to use to manage to attend students for any department of the University. Due to student's interest in classrooms, and which is the largest union in the study environment of university or institution, recording absence at a department having a large number of students in a classroom is a difficult task and time-consuming. Moreover, the process takes much time, and many efforts are spent by the staff of the department to complete the attendance rates for each student. So in many institutions and academic organizations, attendance is a very important criterion which is used for various purposes. These purposes include record keeping, assessment of students, and promotion of optimal and consistent attendance in class. As long as in many developing countries, a minimum percentage of class attendance is required in most institutions and this policy has not been adhered to, because of the various challenges the present method of taking attendance presents. The process of recording attendances for students was in the form of hardcopy papers and the system was manually done. Besides wasting time and taking efforts to prepare sheets and documents, other disadvantages may be visible to the traditional one due to loss or damage to the sheets-sheet could be stolen.

Genre Classification and Music Recommendation System

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The main aim is to create a machine learning model, which classifies music samples into different genres. It aims to predict the genre using an audio signal as its input and provide song recommendations based on the genre detected.

The classifier that works the best when trained with all the features is Random Forest. Random Forest has an accuracy of 66% with the top features. The accuracy of the classifiers increases as the number of features used for training the classifiers increases. The accuracy of the model can be increased by experimenting with other advanced machine learning algorithms. It can also be improved by fine-tuning the hyperparameters.

Based on the determined genre, we provide music recommendations to the user, so that they can explore more songs of the similar genre.

Caption Recommendation System

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With the development of machine learning, the combination of image processing and natural language processing has attracted a lot of attention in the last few years. Image captions represent this file, making the computer learn to use one or more sentences to understand the visual content of the image. The process of producing a meaningful description of a high level of image semantics requires not only the perception of an object and a place, but the ability to analyze the nature, features and relationships between these objects. Although captioning an Image is a difficult task, many researchers have found significant improvements.

We aim to create a web based image captioning application, by which the user will be able to see the object description by just uploading the image of it. By just one click people suffering from partial blindness can know different objects around them. Here we are going to use machine learning to detect the objects in the image and also generate captions related to the image.

Through this project, we intend to create an image captioning web-app. Image Captioning is the process of converting an image to a textual description. Image captioning has a huge amount of application.

With this Image Captioning web-app, we aim to help people who have low eyesight. With the help of machine learning, the caption for a particular image will be generated. The captions generated from images can also be used to find related photos from the internet, i.e. the users can take the captions and put it on the internet to find related images.

To use our system the user first uploads the image on our web application that image will appear on the web page and below the image the user has to click on generate caption which generates caption by calling our prediction function from our backend and then the caption will appear on our web page. Our system also has an option for text to speech in which the caption which is generated is also available in the form of speech. So, the user can listen to what caption our system has generated

Housing Society Management System

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In the 21st Century, using pen and paper to store data is no longer reliable. We need a much stronger and secure system to keep track of every data we store. Huge complexes having big community halls are wasted as no one is utilizing them properly.

Health, being the most important factor of all, after the COVID-19 fiasco, is being affected the most. As times are getting difficult, we need a much better mechanism to manage the health and hygiene of the complexes, therefore it comes with an emergency button which is there to help senior citizens 24/7,it also comes with a dropdown screen with all the emergency numbers for the resident's ease of view. Managing committee often gets tired of maintaining multiple email groups; excel sheets containing members' contact information, vehicle details of owners and at the same time addressing the grievances of the housing society residents.

A much organized format for collection of staff attendance and maintained collections is also being aimed to create .Also we have included backyard sale event, in which the residents can sale their things and outsiders or residents can buy the things on sale. The outlook of that particular page will be displayed as a calendar with blocks as events. Residents can view and request the admin for amending the calendar dates with their events. Also maintaining record of maintenance is tedious now a days , we have incorporated maintenance record page in which residents can pay their monthly maintenance and also admin can view who all have paid the maintenance. Also there is notice/suggestion page on which resident and admin can post. There will be an email notification send to the residents.

Also, food is being wasted in large quantity in functions and events. So, in our system we are going to manage food wastage, by organizing food donation camp. As times have changed, most of us have strived to combine technology with our daily chores irrespective of the field. Thus, changing the way of maintaining the society information will also prove to be beneficial, improve efficiency and save us time.

Stock Market Prediction Analysis using ANN

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In Stock Market Prediction, the aim is to predict the future value of the financial stocks of a company. The recent trend in stock market prediction technologies is the use of machine learning which makes predictions based on the values of current stock market indices by training on their previous values. Machine learning itself employs different models to make prediction easier and authentic.

The paper focuses on the use of LSTM based Machine learning to predict stock values. Factors considered are open, close, low, high and volume. In the last few decades forecasting of stock returns has become an important field of research. After the discovery of non linearity in the stock market index returns, many literature have come up in nonlinear statistical modelling of the stock returns, most of them required that the nonlinear model be specified before the estimation is done. In literature, different sets of input variables are used to predict stock returns. In fact, different input variables are used to predict the same set of stock return data.Some researchers used input data from a single time series where others considered the inclusion of heterogeneous market information and macroeconomic variables. Some researchers even pre-processed these input data sets before feeding for forecasting. Long-Short-Term Memory (LSTM) Recurrent Neural Network is one of the popular deep learning models, used in stock market prediction.

In this task, we will fetch the historical data of stock automatically using python libraries and fit the LSTM model on this data to predict the future prices of the stock.In this task, the future stock prices of State Bank of India (SBIN),Industrial Credit and Investment Corporation of India Bank(ICICI) and Apple are predicted using the LSTM Recurrent Neural Network. Our task is to predict stock prices for a few days, which is a time series problem. The LSTM model is very popular in time-series forecasting, and this is the reason why this model is chosen in this task. The historical prices of SBIN, ICICI, APPLE are collected automatically using the pandas library of python by using the pandas data reader. We have used 8 years of historical price data, from 01.01.2012 to 31.12.2020. With the introduction of Machine Learning and its strong algorithms, the most recent market research and Stock Market Prediction advancements have begun to include such approaches in analyzing stock market data.

The Opening Value of the stock, the Highest and Lowest values of that stock on the same days, as well as the Closing Value at the end of the day, are all indicated for each date. Furthermore, the total volume of the stocks in the market is provided, With this information, it is up to the job of a Machine Learning Data Scientist to look at the data and develop different algorithms that may help in finding appropriate stocks values. Predicting the stock market was a time-consuming and laborious procedure a few years or even a decade ago. However, with the application of machine learning for stock market forecasts, the procedure has become much simpler. Machine learning not only saves time and resources but also outperforms people in terms of performance. it will always prefer to use a trained computer algorithm since it will advise you based only on facts, numbers, and data and will not factor in emotions or prejudice.

DACSO – Data Acumen Solutions

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Exploring data sets and having a great understanding about the data is one of the most important skills. The ease of learning and using powerful libraries, production readiness and integration with web stack are some of the main reasons for using python. Various powerful python libraries to perform data exploration has been used for the project. Matplotlib, NumPy, pandas are powerful libraries to perform data exploration in Python. The main idea of this project is to create a software for some of the regular operations which are required frequently. For security purpose, there's user authentication page as well.Four Machine Learning Models such as Logistic Regression, Decision tree, Random Forest and Naive Bayes has been developed. The user can compare the data of their dataset using these models and can get different insights about it.

The project can perform various functions which includes basic Features, checking for Duplicate Values, analysis on missing values, visualizing missing values, column wise analysis, get implied numerical, categorical and datetime features, univariate and bivariate analysis of selected columns, 4 different Machine Learning Models to analyse data. the primary goal of this project is to maximise the analyst's insight into a given data set and its underlying structure, while providing all of the specific items that an analyst would want to extract from a data set, such as a good-fitting, economical model, a list of outliers, uncertainty estimates for parameters and a list for important factors.

Data is predicted to expand up to 50 times by 2022, according to estimates. Companies must stay current with the demands of large volumes of data in order to avoid becoming obsolete. As a result, advanced analytics professionals are seen as critical for firms to change their business models and stay ahead of the competition. The scope of data analytics in India is vastly seen in companies like policing, banking, healthcare, fraud detection, e-commerce, energy, telecommunications, and risk management.The possibilities are endless when it comes to future use cases for our project in various industries such as Education, Healthcare, Manufacturing, Logistics and Delivery, Transportation and many more.

NETWORKING AND SECURITY

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The rapid development of computer network system brings both a great convenience and new security threats for users. Network security problem generally includes network system security and data security. Specifically, it refers to the reliability of network system, confidentiality, integrity and availability of data information in the system. Network security problem exists through all the layers of the computer network, and the network security objective is to maintain the confidentiality, authenticity, integrity, dependability, availability and audit-ability of the network.

This paper introduces the network security technologies mainly in detail, including authentication, data encryption technology, firewall technology, intrusion detection system (IDS), antivirus technology and virtual private network (VPN). Network security problem is related to every network user, so we should put a high value upon network security, try to prevent hostile attacks and ensure the network security.

The Clustering Routing Protocols with Checkpoint for Improving the Reliability

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In remote sensor organizations, framework models and applications are designed to think about both asset requirements and versatility, on the grounds that such organizations are composed of various sensor hubs with different sensors and actuators, little recollections, low-power microprocessors, radio modules, and batteries. Grouping steering conventions in light of data aggregation plans pointed toward limiting bundle numbers have been proposed to meet these necessities. In grouping steering conventions, the bunch head plays a significant role. The bunch head gathers information from its part hubs and totals the gathered information. To improve dependability and lessen recuperation dormancy, we propose a checkpointing plan for the group head. In the proposed plot, reinforcement hubs screen and designated spot the current state of the group head occasionally. We likewise infer the checkpointing span that maximizes dependability while utilizing a similar measure of energy consumed by clustering routing conventions that work without checkpointing. Exploratory correlations with existing non-checkpointing plans show that our plan decreases both energy consumption and recuperation inactivity.

In this paper, we proposed a checkpointing plan for bunching steering conventions. Our plan can reduce energy utilization and recuperation idleness when a bunch head bombs fleetingly. What's more, our checkpointing plan is not difficult to execute. The reenactment and genuine world testbed results show energy consumption and recuperation dormancy efficiencies when our it is executed to checkpointing plan.

While planning a proficient sensor application, we should consider the asset requirements of sensor nodes and their versatility. WSN clients are worried about data quality and client necessities for real-time highlights are likewise expanding. Additionally, sensor applications are venturing into crueler and more dangerous conditions. Along these lines, shortcoming lenient plans have arisen as significant issues in WSNs.

Clustering routing protocols such as LEACH, PEGASIS and TEEN were designed to improve both energy efficiency and scalability. These conventions create groups and choose a bunch head in each cluster. The group heads total information from its part hubs and diminish how much messages sent by part hubs to the BS straightforwardly. In bunching directing conventions, group head the executives is needed in light of the fact that the job of the bunch head is a higher priority than one of part hubs.

Network topology

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Network topology is the way various components of a network (like nodes, links, peripherals, etc) are arranged. Network topologies define the layout, virtual shape or structure of network, not only physically but also logically.

The way in which different systems and nodes are connected and communicate with each other is determined by topology of the network. Topology can be physical or logical. Physical Topology is the physical layout of nodes, workstations and cables in the network; while logical topology is the way information flows between different components. Distances between nodes, physical interconnections, transmission rates, and/or signal types may differ between two networks, yet their topologies may be identical.

Design and Development of Women Safety Device

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Women safety device is designed as a prototype that has to be installed in a watch, which is built with Arduino Uno as main brain for the project, A button as an input for the activation of the device. As soon as the button is pressed every module connected gets activated with minute delays after each module functioning. Call, text with Location is sent to the preset numbers and to the nearby emergency services with the help of GSM/GPRS and GPS. A Esp32 cam module is installed for capturing Image of the attacker and a buzzer is also installed to alert nearby people and to panic attacker.

The main aim of this project is to install this system into a watch including more advancement in it.

DEEP LEARNING FOR EMOTION DETECTION

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Online education has developed rapidly due to its irreplaceable convenience. Under the severe circumstances caused by covid-19 recently, many schools around the world have delayed opening and adopted online education as one of the main teaching methods. However, the efficiency of online classes has long been questioned. Compared with traditional face-to-face classes, there is a lack of direct, timely, and effective communication and feedback between teachers and students in the online courses. Previous studies have shown that there is a close and stable relationship between a person's facial expressions and emotions generally. From the perspective of computer simulation, a framework combining a face expression recognition (fer) algorithm with online courses platforms is proposed in this work. The cameras in the devices are used to collect students' face images, and the facial expressions are analysed and classified into 8 kinds of emotions by the fer algorithm. An online course containing 27 students conducted on tencent meeting is used to test the proposed method, and the result proved that this method performs robustly in different environments. This framework can also be applied to other similar scenarios such as online meetings

Emotions are an integral method of expressing our judgement and decisions in daily life, and this work aims to recognize and detect these emotions accurately. This work is capable of recognizing 7 integral emotions – Happy, Sad, Anger, Fear, Neutral, Surprised and Disgusted; with the help of the Haar Cascades, TensorFlow and OpenCV implementation. It primarily uses only 2 crucial features of the face, namely eyes and mouth, to detect an emotion. The advantage of this system is that it needs only 2 features for detecting the emotion, which satisfyingly decreases amount of storage data necessary for testing and for future applications.

Automatic Plant Watering System

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Automatic Plant Watering System In our day to day hectic and stressful life it is very difficult and challenging to maintain home gardening even sometimes we forget to water the plant and sometimes it happens to be because of some reason we have to go outstation for some days or weeks this make plant growth slow and sometime plants die to. In such cases the automation plant system is very needed and useful its make the home gardening very easy and hessel free.

To maintain the home gardening by making this gardening automatic we used different IOT sensors, electronics component and controller.
Step 1 First we study soil category for each plant according to the water need of the plant from different website and articles and we have used capacitive soil sensor to detect dry and wet condition of plant.
Step 2 Then we connected the water pump and soil sensor with the relays and Arduino in such way that its automatically detect the soil moisture once a day and if the soil is dry then water pump is on for fixed duration and its get turned off once soil is in wet state otherwise its repeat the process until the soil is complete wet or the water need of the plant is reached.

Now this project is battery based and power supply based in future we can make this system solar based by simple modification We can add wifi interface and camera which will upload data to check condition of plant which will give us idea about the system is working proper and also keep us update about health of plant."

DIET PLAN MAKER

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The emergence of technology has made the generation sedentary. As per World Obesity, approximately 2.7 billion adults get obese and around 177 million adults will be severely get affected by 2025. For such audiences, a diet plan generator is a rescuer. It assists in following a proper diet for such users and keeping a daily check on their calorie intake. An application that people can access on daily basis to quickly get a plan ready for the day where a personalized diet plan is created for every user by considering their weight preferences.

This application provides users with a feature of regenerating the diet plan if he wishes to for which the algorithm running behind already creates multiple plans according to the calorie intake of that particular user. As the physical activity of a person may affect the BMI so taking note of this factor the total calorie is calculated accordingly. A user can also get a plan based on his diet types like veg and non-veg. The application is focused on the Indian audience, for also which the dataset contains most of the native food items. The system in the backend calculates the per-day calorie consumption for a user based on factors like age, weight, height, gender, and weight preferences. According to the number of calories, the total calories are further divided into four meals which are breakfast, lunch, snacks, and dinner. Several dictionaries are created accordingly to a generalized piece of code which is then fed to the main algorithm which creates a diet plan. The algorithm is created and implemented based on the Sum of Subsets problem in dynamic programming. The diet plan is generated in a matter of seconds as the time complexities of the algorithm are very efficient. The data is fetched from a standardized dataset which consists of valid and accurate parameters like the number of calories present in a particular food item along with its serving size and diet type.

Finally, the user can see the total number of calories with particular meal calories he/she has to consume. Based on the same, food items in the range that will be shown. Since the diet plan will be auto-picked, the food items present in it may not be the most preferred choice of the user. For such cases, the application consists of a shuffle option that will generate a new diet plan with different food items.

Electronic Authentication Using QR Code And OTP

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We are all aware that the number of people who use the Internet is rapidly increasing. People now a day employ a variety of online services provided by banks, colleges, hospitals, onlineresources, bill payment, and other internet-based services. The most common usage of text-based authentication is for accessing online services. Text-based authentication has usability and security problems that make it unsuitable for customers. The main purpose of the paperis to employ QR codes and OTP services to make the system more safe for users while alsomakingit morecompliant for imposters.

One of the most critical facets for the authentication system's requirements is security. We've proposed secure system approaches with varying degrees of shoulder surfing resistance. To utilize this authentication method, the user must first register with the system by filling outthe basic registration information. After completing the registration process, the user may access the log in module, where he or she must first authenticate the account by providing the username and password provided at registration. Following a successful login, the system will request for a QR code and OTP for further authentication. The activity generates a QRcode in a folder and delivers an OTP to the registered email id. The user may freely access the system after providing the right information.

Android Password Manager

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With the increase in security breaches, secure login credentials are a need for everything from bank websites to social media applications. With boon in such providers, it's essential to maintain a unique and strong password for each entity. But it's not possible to remember all these complex passwords. In a vain attempt to organize these passwords, we either write them down or store them in external storage devices that are all prone to data breaches.
This paper presents research on how various password management tools have implemented features such as text encryption algorithms, strength checkers, password generators, and many more providing a secure organization of our passwords. And using this knowledge as a base for developing an android based password management application abiding by the rules to assure data security and provide an ergonomic experience.

In this paper, we have explained the working of a simple password manager that we developed using the IDE tool android studio, realm database and JavaScript implementation of AES encryption algorithm. The application stores the data in a local android database. Only the password is saved in an encrypted format and is recovered in decrypted format, without the need for the user to enter a key, as it uses the time at which it was created as the key. The user can access the password with one click and it gets saved in the device's clipboard, ready to use just paste and you are all set, no more 'forget password' and long procedures. The application saves data and we canverify the content by viewing the database data file in realm studio.

The application securely manages the passwords with many more features. Developed using Android studio JAVA. The application also incorporates the text encryption algorithm AES.

iSPY: Building Undetectable Windows Malware Using C

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In this modern era, digital technology plays a serious role in all aspects of life. People are habitual to using computers and smartphones to access info, create, express, communicate, and collaborate, contributing to their personal, social, and skilled survival at a pleasant level. As the legitimate use of digital scope has expanded, therefore have the anticipation for malice via swindlers, blackmailers, vandals, and different criminals, to profit by making and generating malware. Malware is a constant threat to security systems, and it is ceaselessly evolving. In this modern era, digital technology plays a serious role in all aspects of life. People are habitual to using computers and smartphones to access info, create, express, communicate, and collaborate, contributing to their personal, social, and skilled survival at a pleasant level. As the legitimate use of digital scope has expanded, therefore have the anticipation for malice via swindlers, blackmailers, vandals, and different criminals, to profit by making and generating malware. Malware is a constant threat to security systems, and it is ceaselessly evolving. Researchers and different security companies are working to develop a more effective and efficient anti-malware system, in order to protect devices from such threats a forever battle, as the complexity of malware changes as quickly as innovation is growing. One challenge that arises for the malware developers is to successfully hide the malware without alerting the target. As the Anti-malware field is evolving, it becomes very difficult to stay undetected. In this paper, we present iSpy, a backdoor malware developed for Windows Operating Systems. iSpy, is made using C programming. Using merely basic evasive tactics like coding obfuscation, iSpy was able to outsmart 38 well-known antivirus vendors.

For the implementation, we have developed a malware for windows using socket programming in C language. The malware gives access the attacker the access to target’s command shell once it is executed on the target system. The console of the application is kept hidden to avoid suspicion by user. We have also added a keylogger to record the target’s keystrokes. To overcome the challenge of detection, we have used code obfuscation techniques. Comments with random characters and unused if else statements are added to the source code. The hex values of the compiled malware are changed using hexeditor to bypass antivirus vendors. Furthermore, to avoid detection and hide our malware. We archived the malware into a SFX archive using WinRAR. When executed, the archive file extracts the malware into Temp folder and runs it. This makes the antivirus vendors unable to detect malware which lies inside the archive.

The virus consists of two files: a backdoor executable file for the target's system and a backdoor executable file for the attacker's system. The attacker starts the server by running the server file first, then waits for the target to run the malicious file. When the malicious file is run, a server-client connection is established, allowing the attacker complete access to the target's command shell. A dialogue box appears once the connection has been established for the benefit of clarity. The attacker now has access to the shell. A keylogger is also installed to record the target's keystrokes, which are saved in the same system as windows.txt files.

SIEM (SYSTEM INFORMATION & EVENT MANAGEMENT)

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As we all know today's world is all about metadata , networks, Information face increasingly sophisticated and chronic threats about the knowledge we store, where the new threat tools and exploits vulnerability.Current threat detection systems often create too many alerts, which contain insufficient data for analysts. As a result, the overwhelming majority of alerts are ignored, contributing to security breaches that may otherwise are prevented. Security Information and Event Management (SIEM) software may be a recent development designed to boost alert volume and content by correlating data from multiple sensors. However, insufficient SIEM configuration has to this point limited the promise of SIEM software for improving intrusion detection. The main target of our research is the implementation of a framework configuration of SIEM software on Cloud setup to make it affordable and provide information on the increase in cyber crime activities .Our research resulted in a very new log ontology capable of normalizing security sensor data in accordance with modern threat research. New SIEM correlation rules were developed using the new log ontology, and also the effectiveness of the new configuration was tested against a baseline configuration. The novel configuration was shown to boost detection rates, give more descriptive alerts, and lower the amount of false positive alerts.

The objective of this research paper is to provide etiquette information on the increase in cyber crime activities and how simple and affordable We used different cloud services, compiling which a SIEM solution was obtained. The services include virtual machine, websites, load balancers, Availability sets,log analytics and Sentinel.

Behavior and patterns of threat actors were studied and understood. Understanding new rules and procedure were put down to differentiate malicious activities and user activity To secure the Virtual machine hosting the client website load balancer with custom rules were put down keeping our client secure and locked away from malicious activity.

However, to not waste the opportunity to study and understand the methods implemented by threat actors a honey pot was put in place which logged all activities this information can be used by data analysts and to train different machine learning models.

The project visualizes the activities happening using sentinel log analytics space with custom inbound rules.this makes it easy for non technical clients to understand the cyber space and to secure themselves. As a result, Client get secured. We got to study and understand the malicious activities more (honey pot). Non technical folks can understand and visualize the all the activity and traffic that's happening (sentinel work)

Data Concealing using Cryptography & Steganography

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The main objective of this system is to secure the communication medium by combining two data securing techniques. It also aims to communicate confidential data over the internet.

It is a Computer Software with Graphical user interface which consists of two modules.

1. Encoding Module
2. Decoding Module

The Encoding Module has two input fields where the user has to input the secret data that has to be secured and an image file for covering medium. The system will then use Cryptography AES Algorithm to encrypt the text and will convert it into a cipher text which will be unreadable. Then the system will use Image based Steganography LSB to hide this cipher text into the image file that the user has provided. An image file consists of a number of bits. This system will replace the least significant bits of image with the data bits of the cipher text and provide an image file with secret data called Stego Image. This Image user can share securely over the internet.

The Decoding Module has an input field of image where the user has to provide the Stego Image. This module will then trace the data bits from that image and then form a cipher text. This cipher text will be decrypted using the AES algorithm and the system will provide the secret data text to the user.
We have implemented this system using Python language and its libraries such as tkinter, opencv-python, numpy, etc.

This software can help the world for better data security over communication mediums. AES is one of the secured symmetric key algorithms which is way difficult to crack. And stego image contains only cipher text that means if an attacker will get that they cannot decrypt it easily with encoding and decoding module.

Keylogger : Monitoring and Recording

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A Keylogger is a software or hardware that tracks the key pressed on your console, in such a way that the user has no idea that his activities are being tracked.

This paper focuses on the real time implementation of the key logger. The keystrokes and screenshot both will be captured and will be send to the attacker through the mail. Every key that is pressed will be captured and will be saved in the .txt file. The screenshot will be captured at particular time intervals and will get saved in folder which will be forwarded via e-mail ."

Bruteware

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Brute force attacks are predominantly getting difficult to get successfully detected due to increased advanced techniques, a huge number of network traffic, etc. Massive research is done in this field still some types of attacks are undetected since no mitigation can undo the harm to zero. Intrusion detection techniques should be used to detect the abnormal behavior in the network at its early stages. Although Intrusion Detection Systems or IDS is helpful against attacks like brute force but many times it can give false alarms so it required to have a proper filtering systems to avoid false alarms and to have correct differentiating factor of High traffic and malicious activities.

Reporting such activities to administrator or group in charge are done using SIEM systems or Security Information and Event Management systems. IDS are classified into 5 types namely, Network Intrusion Detection System (NIDS), Host Intrusion Detection System (HIDS), Protocol-based Intrusion Detection System (PIDS), Application Protocol-based Intrusion Detection System (APIDS), Hybrid Intrusion Detection System. IDS systems set off alarms when the attacks are actually happening so it's very crucial to have proper measures to stop it. Logs are one of the ways to keep track of the incoming attacks and to take action against it. This research shows that based on number of tries how counter measures can be taken to stop the brute force attack to take place successfully. Brute-force attacks can either fail or succeed. Regardless of the results of the attack, it leaves extreme number of entries in the logs or databases etc. That's why detecting a Brute-force attack at early stages solves the problem.

The objective of this project will be to detect and stop the brute-force attack as soon as possible. It may happen again and again, that's why logs are very crucial part of the system. It will prevent such attacks from happening again and again. The way we implement these in the project is first, creating a website using HTML and CSS and with help of PHP & JavaScript we will design the backend. When there will an invalid entry on the input fields, our PHP program with immediately capture the IP address along with the time on which the entry has been taken place in form of Timestamp. After capturing the necessary data, it will update it in our database. After getting the data, our program will calculate the number of tries and subtract it every time the user makes an invalid entry. Maximum number of tries will be hard-coded in our program. After the number of tries is zero it will impose timeouts on the IP address every time the user crosses the maximum tries. But if the user provides correct inputs, it will redirect the user to our home page which displays click counter with Bruteware logo over it and it will have a logout button too right below the click counter which will end the session.

The advantage of such system is that it provides a Anti Brute-force attack prevention and protection also working as and entity in the actual data representation. It is fast and basic, This will help to detect attacks even quicker and give ample amount of time to act against it. Brute-force attacks are been there for long time and it is still a threat to society if left unattended. Many systems are getting well-equipped to face Brute-force attacks with proper and Decisive counter measures to ensure data security. It is hoped that this study will give proper information about one of the techniques used to prevent Brute-force attacks.

Image Recon

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We are living in the cyber era were scammers and fraudsters cheat easily. What if a fraud happened on a social media site? If that person is real then how can we find that person just by using that person's photo? Is it possible?
Yes! Using image recon, we can find the social media accounts associated with that person so we can gather information easily. Basically, image recon is the tool that helps to find the person's online social media accounts.
This technique is also called reverse image search. Image recon is the simple tool just upload the image and enter if that person is on any platform social media image recon create a list of that person's profile links and dump in the notepad.

The Deep learning and image classification hasplayed an essential role in the development of image recognition during the last few decades. The type of information we're looking for isn't available to us in our case; we don't have any such information. In the meantime, we can still use openly available deep learning models trained on other datasets.

Content-based image retrieval (CBIR) uses the visual options of a picture such as color, shape, texture, and spatial layout to represent and index the image. The search engines, that used the CBIR techniques, are referred to as Reverse Image Search Engines. An image classifier uses neural networks to convert high-dimensional pixels into data that represents characteristic "features" that have been learned by the network. Once a trained neural network is dissected, its last high-level layers originally used to classify objects can be removed, allowing our images to be transformed into feature vectors.

We can convert all images in online search engine databases to feature vector representations by utilizing our "feature extraction model." This technique can be used to define a training set, for example, as a preliminary step toward developing supervised image classification models. By clustering images and inspecting a few from each cluster, all images can be tagged. Identifying all our images is as simple as looking at a few examples from each cluster.

This is clearly an improvement over manually scrolling through and annotating 100.000 images. As a result, automatically labelling all images in a cluster with the same label might result in some mislabeling. Even so, it's still a good starting point for an in-depth analysis.

In order to compare our feature vectors, we need to convert our images into feature vectors first. An example of such an indicator, and the one used in this example, is the "cosine similarity". Basically, it is a measure of "angle" between images in a high-dimensional feature space.

Supply Blockchain

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Blockchain development offers critical entryways for the stock organization the chiefs. This paper means to frame crafted by blockchain advancement in the field of the creation organization. But the advancement has been extensively associated with computerized monetary standards, non-money related applications, for instance, store organization, influence, and food industry are also uplifting.

Blockchain can give an enduring, shareable, auditable record of things through their store organization, which further grows thing conspicuousness, realness, and authenticity in a more functional way. In this part, the potential improvement presumptions through blockchain advancement for the example of agribusiness were discussed. The proposed case for auto creating small plant with blockchain advancement was also introduced.

HoneyTrack

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With the tremendous growth of cyber-attacks, the loss of private/sensitive data has risen to a peak. Honeypots are one of the most concerned topics in the field of cyber security currently. HoneyTrack is a honeypot that uses various technologies like Docker, Shell Scripts, Python, Elastic Search, Kibana, and Filebeats which will backtrack the hacker when it intrudes the target network.

Information about the attacker will be gathered by the bot in the honeypot which will help us reach the roots of the attacker. The target networks could be varied and cause a lot of damage when sensitive data will be lost/stolen. However, this honeypot is similar to a traditional honeypot but quite updated with new generation technology and needs.

As the technology is advancing we definitely have to face some pros and cons to it. Lot of personal information and confidential company/organization's data have been facing various threats and data loss. To prevent all these attacks and data loss efficiently, we used the concept of honeypot and built HoneyTrack. A Honeypot, as the name suggests, is used for luring the attackers with the motive to analyze and observe their moves and methods of launching an attack.

A lot of various technologies like IoT, DDoS, etc have been combined with honeypots to give a safer approach to information security, making it much more efficient than before. This new generation honeypot technology approach can be taken towards a very productive outcome. While preventing attackers in the company/organization network we can also backtrace them and root out/prevent the attacks for instance.

Pre-processing Techniques on Medical images for extracting liver image

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Image processing is utilized in medical applications to diagnose and treat a wide range of disorders. Image segmentation is one of the most important jobs in most medical diagnosis technologies. In recent years, accurate segmentation of medical pictures has been a major challenge. The purpose of image segmentation is to simplify and/or transform an image's representation into something more significant and easier to study. Image segmentation is commonly used to find objects and backgrounds in images. It was employed in this work to segment a liver image from an abdominal CT scan.

This paper presents the method of liver segmentation for preprocessing using thresholding and kmeans. In this paper, the standard k-means technique is used to segment a liver image. A threshold is chosen in thresholding segmentation to maximize the global average contrast of edges identified by the threshold throughout the picture.In k means approach the value of k is chosen to be 2 so as to generate an effect similar to thresholding method. A binary mask of the liver is generated using both these method and segmented liver image is obtained.To create a binary mask of the liver, both approaches are applied.

This paper compares the result obtained from both the approaches. In this paper, comparative analysis is done between two methods using Jaccard's Index.

FPGA based Blind Assistance System

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Sighted guidance is arguably the most efficient way of guiding the visually impaired. Sighted guidance system will provide haptic feedback to the user about the obstacles in the user's path. To detect these obstacles, different options are available for sensors. Among these we are using a stereo camera to take advantage of its ability to provide visual information about the user's surrounding and ultrasonic sensors placed strategically to estimate the distance between the user and the obstacle. This data is run through a YOLO based algorithm which will be trained to detect obstacles in the user's path and this will be relayed back to the user using Haptic feedback. The FPGA can provide true parallel processing while maintaining reconfigurability and programmability. This sensors will be mounted on a standard white cane, reason being this piece of equipment is already familiar and a part of the daily life for the visually impaired. This system will inform the user about obstacles in 5-8 meters range and will allow them to navigate around these obstacles easily and safely.

Around 62 million people in India are visually impaired, for them performing even basic daily tasks is a challenge. An activity as simple as travelling, which is one of the most fundamental parts of our daily life, can become a havoc. Walking in an urban environment means there are several obstacles in the path, these may be fellow travelers, stray animals or some other obstacles. Navigating around these obstacles can be a problem for the visually impaired. Such inconveniences in travelling disrupts their daily life. This project aims to provide a solution for these issues faced by them.

We focus our project on helping them navigate while walking. To do this, we are reinforcing the already in use walking stick used by them. We are planning to design a system which will be mounted on this stick and will enable them to micro-navigate in situations where relying only on a regular walking stick is not feasible. This system will see the path in front and will try to identify potential obstacles in the path and inform the user using haptic feedback. This will help them preemptively judge the surrounding layout and the approximate location of obstacles. Doing this will make it easier for them to travel and will save effort and time.

In this project, the combination of a Field Programmable Gate Array (or FPGA) and an stereo camera will be explored to get effective data about the surroundings of the user. The medium of haptic feedback will be used to alert the user. A 2V - 5V dc mini vibration motor will be used. Haptic alerts are considered being one of the most preferred choices in types of feedbacks, as it eliminates the need for the user to wear any extra feedback equipment (like earphones, etc.) which might block or hamper the user's natural ability of hearing.

Design and implementation of 8 bit multiplier using FPGA

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Multipliers are one of the most important parts in signal processing or other computationally intensive applications. Therefore, designing multipliers that are high speed, low power and less area of substantial research interest. Many attempts have been made to reduce the number of partial products generated by multiplication process. The aim of our project is to Implement a Multiplier block using shift and Add technique of multiplication in an FPGA.

The implementation is done by using Xilinx 14.1 version using FPGA board of Mimas V2 Spartan 6. The performance of Multiplier unit is evaluated for various parallel prefix adder variants, which are developed for high speed addition. The experimental results shows that the implemented Multiplier using hybrid parallel prefix adder is efficient in area, consume low power and high speed compared to existing parallel prefix adder models. This is a 8 bit multiplier of two numbers and the multiplication is performed using shift and add method. Once the multiplication is completed the output result is also converted to its binary coded decimal.

This is done using the double dabble method of converting binary numbers to binary-coded decimal(BCD) . In output we get both binary and binary coded decimal representation.

Voting Machine System

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Voting Machine is a simple electronic device used to record votes in place of ballot papers and boxes which were used earlier in conventional voting system. Fundamental right to vote or simply voting in elections forms the basis of democracy. All earlier elections be it state elections or centre elections a voter used to cast his/her favorite candidate by putting the stamp against his/her name and then folding the ballot paper as per a prescribed method before putting it in the Ballot Box. This is a long, time-consuming process and very much prone to errors. This situation continued till election scene was completely changed by electronic voting machine. No more ballot paper, ballot boxes, stamping, etc. all this condensed into a simple box called ballot unit of the voting machine. To solve this problem and to be more efficient then using ballot paper which is a long and time consuming method of calculating and casting votes. Using our voting machine using FPGA board, we save a lot of resources and time for casting votes and calculating total number of votes for each party.

The main Objective of this project is to simulate the working of a electronic voting machine using a FPGA board, Xilinx Software and using verilog language for programming the code.

We used a Mimas V2 Spartan 6 FPGA Development Board for programming and showing the output on the FPGA board LED's. We use verilog programming language to code the working of a voting machine. After toggling the switches on the board of the specific voting party, the votes of that specific party will be counted and shown in the form of binary on LED's.

The verilog code will be reading the input votes from the switches on the FPGA board and display the output ie the total number of votes on the FPGA board. The LED's on the FPGA board will display the total number of votes casted by the people into the voting machine.

32 bit ALU

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The paper presents Design and Synthesis of 32- BIT Arithmetic Logic Unit (ALU). The design has been implemented using VHDL Xilinx Synthesis tool ISE 9.1i and targeted for Spartan device. ALU is designed to perform Arithmetic operations such as addition, subtraction, overflow; logical operations such as AND, OR, XOR, XNOR and NOT operations, Parity check, 1s and 2s complement operations, compare, etc.

The ALU is a fundamental building block of the Central Processing Unit (CPU) of a computer, and even the simplest microprocessors contain one for purposes such as maintaining timers. The processors found inside modern CPUs and Graphics Processing Units (GPUs) accommodate very powerful and very complex ALUs; a single component may contain a number of ALUs. Flags like Zero, Carry and Odd Parity show the status of each Flag for result of the ALUs operation in each clock cycle. Zero Counter counts number of zeros in the result.

The modern ALU must be capable to perform all the binary arithmetic and logical operations to meet the requirements of modern VLSI industry. So, the paper is a forward step to design the ALU and meets the demand of present FPGA based technology.

Pick Your Style – Virtual Trial Room using Augmented Reality

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When most people think of shopping, the first thing that springs to mind is still the in-store buying experience. Customers can try on garments in real-time, but when there aren't enough trial rooms, this process takes too long. In order to enlarge sales many companies have adopted online methods by providing an e-commerce website, applications, etc. This new interface for shopping has gained people's attention due to the hassle-free approach by getting everything virtually with the click of fingertips. The main problem of Online Shopping is that the size charts vary from site to site and company to company resulting in user disappointment after buying the product. Online shopping is difficult for customers while buying clothes they cannot try and see how they will appear on them, and after receiving the product if it does not match the requirement, customer has to return the product which is a time-consuming process.

Many authors have proposed different applications for making online shopping productive by giving customer an opportunity to virtually try their products. Existing virtual fitting room applications uses image processing technique which does not provide a realistic view of the garment on the user. Also, some applications use the virtual avatar of the user using such application user is unable to see how a particular garment will look on him/her. This paper presents the development of Pick Your Style a mobile application on which users can easily try the clothes of their choice with just a click of the mobile camera. This app will have access to your camera and you can try on clothes in real-time using Augmented Reality algorithms.

This is implemented by using Augmented Reality technology in which first step is detection of body parts, then object is added with respect to desired position of the body parts and finally user can try different filters through our application. This project has the potential to transform the way people try on clothes and shop for the perfect fit. Customers may try on a huge selection of items without having to physically wear them because of the technology of "Augmented Reality." The main objective of this project is to give users a unique experience of trying clothes and different apparel in real-timevirtually.

Review on SQL injection attack

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Many webpages take input from users, such as search terms, feedback comments or username and password, and use them to build a SQL query which is passed to the database. If these inputs are not validated, there is nothing to stop an attacker inputting malicious code, for example, that could instead instruct the database to delete a specific table of client records.

The object of our project is to detect vulnerable websites to SQL injection attack from web. The objective is to know what are the sites which are vulnerable using different parameters of web to avoid the database system of that sites to reveal any of our sensitive information to attackers.

In this paper we have explained the working of our SQL injection attack detector which we developed using python as language. In this project we have have developed a tool which uses public proxies to and scrape the web to find the sites which are vulnerable to SQL injection attack. SQL injections are one of the most utilized web attack vectors used with the goal of retrieving sensitive data from organizations. When you hear about stolen credit cards or password lists, they often happen through SQL injection vulnerabilities. Fortunately, there are ways to protect your website from SQL injection attacks.

IMAGE ENCRYPTION AND DECRYPTION USING 3DES

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Nowadays, multimedia privacy becomes very important. Encryption technology is used to protect multimedia data. There are various techniques to protect confidential image data from unauthorized access. The tension of data production in transmission through any kind of multimedia including virtual image, text, audio and video is increasing. Many techniques are used to ensure privacy, integrity and confidentiality and to prevent illegal contact with sensitive data, including cryptography. Cryptography is the learning of robust transmission strategies that allow the sender and intended recipient of a message to see its contents. We used the Triple Data Encryption Standard algorithm to encrypt and decrypt the images.

Our project is based on the encryption and decryption of images. Various algorithms are used to encrypt and decrypt the messages with great ease. The primary objective of the proposed project is to specify the use of a triple data encryption algorithm when encrypting large numbers of images.

Benefits of this Project:

1. Image can only be viewed by the recipient as the image is encrypted using TDES more over it used secret key.
2. It makes encryption and decryption more protected as the secret key is not stored in the database.

Procedure:

1. Select the operation to be performed ENCRYPTION || DECRYPTION.
2. Give the filepath of the image you want to encrypt.
3. Now, Provide the secret key for your message.
4. With in seconds your image will get encrypted.
5. For decryption, you need to select DECRYPTION.
6. You need to provide same secret which we used for encryption.
7. Soon your image will get decrypted.

Ransomware Attack and Preventions

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In this revolutionary era of digitalization, the risks of financial crime and fraud, institutions are crossing functional boundaries to enable collaborative resistance. With tremendous growth of cyber-attacks, the loss of private/sensitive data has risen to peak. We have successfully filed a copyright of the research work we have done. Ransomware has become a huge threat to public as well as private industries. Kaspersky, one of the global leading anti-virus companies, warned that ransomware is a serious threat because there is no way to recover the effected data. A ransomware is a type of malware that prevents legitimate users from accessing their device or data and asks for a payment in exchange for the stolen functionality. They have been used for mass extortion in various forms, but the most successful one seems to be encrypting ransomware most of the user data are encrypted and the key can be obtained paying the attacker. Globally ransomware has caused a loss of around $5 billion in 2017 up from $325 million in 2015 — a 15X increase in just two years. Every 40seconds a business falls victim to a ransomware attack, according to a recent story by the Forbes Technology Council. According to cyber security ventures ransomware will cause a damage of $265 billion annually by 2031. But this can be detected and prevented at a early stage.

The objective of our project is to create awareness about ransomware and secure yourself/systems from becoming a victim of ransomware. We have demonstrated a ransomware attack on a file by encrypting it. We used python for creating a simple ransomware to encrypt as well as decrypt the file after attacking. Usually in a real attack there is no decryption key if the system is compromised. .But as it was a mini project demonstration, we made a decryption key. For encryption we used AES public key and for decryption we used RSA private key. Steps for preventing ransomware:

1. Invest in proper and effective anti-ransomware tools like Honeypots, Anti-virus, Firewalls etc.
2. Keep software's and operating systems updated to the latest versions.
3. The golden rule of backups states that you should have 3 copies of your systems on to different media with one stored offsite. Many companies choose cloud storage for that offsite copy, but if you want to protect tour backups from ransomware attacks, you will also need to have one stored offline.
4. In case if your system is compromised, never pay the ransom and try decrypting the files using the decrypters. NoMoreRansom is a anti- ransomware project started by tops cyber security firms of the world, this can be as biggest rescue to your systems in case of compromise.

Secure file storage on cloud using symmetric cryptography.

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This project allows users to store sensitive data on their mobile phones without having to worry about confidentiality. This software project concentrates on securing data on mobile phones by storing it in encrypted form.

This system enables the user to store sensitive data on their android mobile phones. User can access the system data by login to the system using his user ID and password then the data will be displayed to the user. Other malicious users can't access the data. Even if a malicious user accesses the data, data will be encrypted which is not in understandable format. By using this system, the user is free from worrying about leakage of his crucial data. Even if a user loses his mobile phone, he can access his sensitive data by login to the system using another mobile phone. Since data is stored in encrypted format unauthorized users would not be able to access the data. By using this android application, a user can access this system anywhere at any time he just has to use his user ID and password to access the system.This software project focuses on protecting data on mobile devices by encrypting it. And data encrypted with a cipher to stream its key stored on the server.

This application allows the user to store sensitive data on their android cell phones. The system will encrypt data and store data online. User can access system data by logging in to the system using his username and password. This app is a web application built on android studio. We have implemented our project using the Java language. The user can encrypt and decrypt the data by following the steps given below,

STEP 1: Firstly, the user has to register on the app. After the registration process, now users will be able to log in on the app with appropriate user-id and password.
STEP 2: After successfully login, the user is now able to store their confidential data like images, audio, video, text files. But in our application, we will be storing only images.
STEP 3: All data is stored in the cloud (Firebase) in encrypted format. It means unauthorized users can't access our data.
STEP 4: If we want our data on another phone then log in with an existing user-id and password. Press on the decrypt button, it will ask for one key. After providing the key, the data will be retrieved.

FILE ENCRYPTION AND DECRYPTION USING AES ALGORITHM

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Data security is a major issue which we are facing today in this digital world of communication. As we know that today hackers are almost at every corner in search of our useful data which can be hacked by them for their different purposes. Even the risk gets doubled when come to the data of any country's government. So, a system or terminology is must required to make that data safe forever by any means during communication. Data protection can be accomplished by changing the original data by any means to some other un useful data so that if someone gets that data then also it must remain in un useful bits. This process can be achieved by Encrypting that data by some means of algorithms which are known to the sender and the similar Decryption algorithms to be known to only the desired receiver so that it can convert that encrypted data back to the user understandable form. Today as it is a need to develop such kind of applications which performs the specified task but along with it should be very much user friendly so that no special skills need to be required to learn in order to use that application or project. In the application or script the user has to select either wants to send something by encrypting or wants to receive by decrypting . If it wants to send then it have to select source file previously designed or type some message which is to Encrypt and then transfer. Whereas on the receiver side again the receiver have to select the file which is to be received from the sender along with a decryption key to decrypt that message Digital communication witnesses a noticeable and continuous development in many applications in the Internet. Hence, secure communication sessions must be provided. The security of data transmitted across a global network has turned into a key factor on the network performance measures. So, the confidentiality and the integrity of data are needed to prevent eavesdroppers from accessing and using transmitted data. Cryptography is a important technique that is used to provide network security. The aim of this project is to develop a new approach to hiding a secret information in an encrypted format, by taking advantage of benefits of cryptography algorithms "

Keylogger in Ethical Hacking

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Keylogger is a software/hardware which captures Key-stroke on a keyboard, typically covertly, so that the person using the keyboard is unaware that their actions are being monitored, this enables in compromising sensitive data like, bank details, passwords etc. Objective of this project is to get the knowledge about the keyloggers and there offensive and defensive techniques and also, we have discussed about its Advantages, Disadvantages and features which can be added to it.

Keylogger is dangerous software but many multi-national companies use this software to share the recorded data to a foreign location, also it is used to track what kind of work your employee is doing. The most famous attack which is Carding in which attacker get access to the pin, cvv and expiry date of Credit Card using keylogger.

Offensive & Defensive Uses of Keylogger:

Offensive Techniques:
1) Attacker / Hacker used for hacking some crucial data of any organization for money extortion.
2) Criminals use keylogger to steal personal or financial information such as banking details credit card details etc. and then which they will sell and earn a good profit**.**

Defensive Techniques:
1) Employers to observe employee's computer activity.
2) Parental Control is use to supervise their children's internet usage and check to control the browsing history of their child**.**

We have read different research papers to get the knowledge of different techniques used to encrypt and transfer the collected data without any data loss. As a result, keylogger is a threat as well as safeguard on the internet which can lead to a security breach also it can prevent from a security breach.

Features can be added to Keylogger:
Adding new Feature to the Keylogger such as:
1) Collect Audio using Microphone
2) Built a timer
3) Encrypt the Files

The following groups are the winners of the competition:

Category I – Major Project:

1st Prize:

Paper ID: DST052
Paper Title: Design and Development of Women Safety Device
Group Members: Gagana T S, Chandana M S, Inam Ulla
Guide: Dr. Suma K V
College Name: M S Ramaiah Institute of Technology, Bangalore.

2nd Prize:

Paper ID: DST014
Paper Title: Safe Routes Recommendation for Drivers by Real-Time Prediction of Accident Risk Scores
Group Members: Akshat Bhat, Trusha Talati, Soham Vaidya,
Guide: Dr. Sudhir Dhage
College Name: Sardar Patel Institute of Technology, Mumbai

2nd Prize:

Paper ID: DST046
Paper Title: "Housing Society Management System"
Group Members: Anushka Chaube, Trushti Chotaliya, Akshit Pithadia, Kritik Rathod
Guide: Prof. Gauri Chavan
College Name: Shah and Anchor Kutchhi Engineering College, Mumbai

3rd Prize:

Paper ID: DST010
Paper Title: "Footstep Power Generation System"
Group Members: Prajakta Bhoi, Hemaja Burud, Sanika Bhayade, Sonali Shrivastav
Guide: Prof. Smita Wadekar
College Name: Smt. Indira Gandhi College Of Engineering, Ghansoli

3rd Prize:

Paper ID: DST071
Paper Title: "Pick Your Style – Virtual Trial Room using Augmented Reality"
Group Members: Kanishk Harde, Shubham Gavhane, Harshkumar Valia,
Guide: Dr. Vinit Kotak
Co-Guide: Prof. Shazia Sayyad
College Name: Shah and Anchor Kutchhi Engineering College, Mumbai

The following groups are the winners of the competition:

Category II – Minor Project:

1st Prize:

Paper ID: DST044
Paper Title: Genre Classification and Music Recommendation System
Group Members: Yash Rane, Sachin Singh, Tarang Ahuja
Guide: Prof. Dhanashree Toradmalle
College Name: Shah and Anchor Kutchhi Engineering College, Mumbai

2nd Prize:

Paper ID: DST065
Paper Title: Honey Track
Group Members: Shrawani Pagar, Atharva Auti, Jay Makwana, Vivek Mishra
Guide: Prof. Shwetambari Borade
College Name: Shah and Anchor Kutchhi Engineering College, Mumbai

2nd Prize:

Paper ID: DST007
Paper Title: IOT Based Irrigation system
Group Members: Samihan Nahush Selukar, Vedant jadhav
Guide: Prof. Jagdish Sarode
College Name: Shah and Anchor Kutchhi Engineering College, Mumbai

3rd Prize:

Paper ID: DST055
Paper Title: DIET PLAN MAKER
Group Members: Rohit Wahwal, Farhat Rauf Shaikh, Kuntal Thakur, Vaishnavi Sarmalkar
Guide: Dr. Rekha Ramesh
College Name: Shah and Anchor Kutchhi Engineering College, Mumbai

3rd Prize:

Paper ID: DST012
Paper Title: Sewage Water Level Monitoring
Group Members: Hetsi Parmar, Sarvesh Sant, Mrudula Bidvi, Pawan Singh
Guide: Prof. Trupti Shah & Prof. Shaista Khanam
College Name: Vidyavardini's College of Engineering and Technology, Vasai.

Directorate of Technical Education Maharashtra State,
Joint Director of Technical Education, Regional Office, Mumbai
in Collaboration
Mahavir Education Trust's
Shah & Anchor Kutchhi Engineering College

TECHNOVATION

Technical Paper Presentation

On 30th April, 2022

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Directorate of Technical Education is to maintain and enhance the standard and quality of technical education by laying policies, establishing and developing Govt. Institutions, guiding and supervising the aided and private institutions, interacting with industry and national level institutions and coordinating with other departments of State Government, Government of India and Statutory Organizations and to contribute to the development of industry and society at large.

About Institute

Shah and Anchor Kutchhi Engineering College (SAKEC) was established in 1985 for the purpose of imparting quality technical education. The college is managed by Mahavir Education Trust. The college is approved by AICTE, New Delhi and Government of Maharashtra, and is affiliated to University of Mumbai. It also has an ISO-9001 Certification.

It offers undergraduate courses in Information Technology, Computer Engineering, Electronics & Computer Science, Electronics & Telecommunication Engineering, Artificial Intelligence & Data Science and Cyber Security. It also offers Post Graduate Courses in Information Technology, Computer Engineering and Electronics Engineering. UG Programs in Information Technology and Computer Engineering of the college have been awarded accreditation by National Board of Accreditation (NBA) from A.Y. 2019-20 for 3 Years.

The Institute has been ranked in the 251-300 band by National Institutional Ranking Framework (NIRF) for the NIRF 2020. The Institute is awarded 'A' (3.16 CGPA) Grade by National Assessment and Accreditation Council (NAAC) w.e.f. 20th Oct 2021.