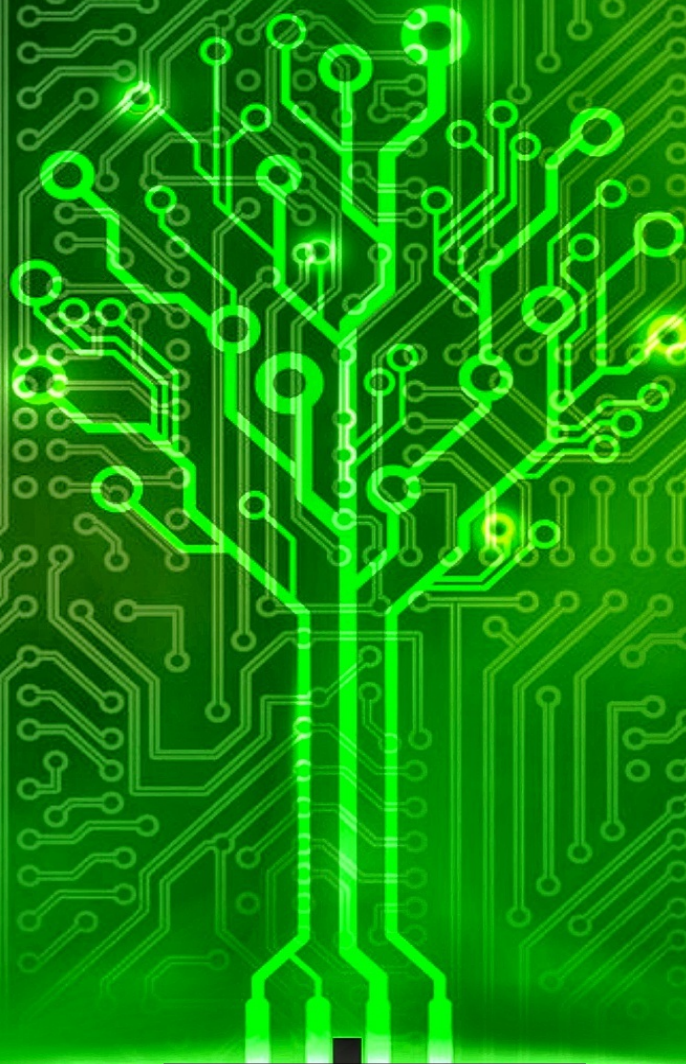




**DON BOSCO COLLEGE
OF ENGINEERING**

**DEPARTMENT OF ELECTRONICS
AND TELECOMMUNICATION
ENGINEERING**



ankur

.....budding ideas

From the HOD's Desk:

It gives me immense pleasure to present our department project idea book “**ANKUR 2k22**”. The wide spectrum of projects in different domains gives me a sense of pride that our students and faculty possess creative potential and original thinking. “**Ankur 2k22**” gives us a glimpse into trending domains like Biomedical, Robotics, Automation, VLSI, Signal processing, Image processing, Internet of Things, Machine Learning, Remote Sensing and many more.

Technology is evolving fast. One of the biggest challenges to keeping on top of emerging technology is that the pace of change is too fast. Innovation, orientation and an ever expanding base serve as a firm foundation for the latest development in the department.

The Department also offers excellent academic environment with a team of qualified faculty members to inspire the students to develop their technical skills and inculcate the spirit of team work in them thus producing confident professionals.

Launching “**ANKUR 2k22**”, a project idea book of Electronics & Telecommunication department is an attempt to be a part of global connection.

“**ANKUR 2k22**” would provide a platform for aspiring engineering to gain knowledge about the latest projects in the various upcoming domains.

The book contains project ideas, applications and student achievements in the field of research and publications.

We invite our readers to respond to the “**ANKUR 2k22**” with suggestions, criticisms and scope of improvement so that this book takes a genuine interactive shape. As we release the project idea book- “**ANKUR 2k22**”, I wish all the readers an enjoyable and an enlightened experience.



Dr. Varsha Turkar, PhD (IIT Bombay)
IEEE Senior Member
Professor and Head,
Dept. of Electronics and Telecommunication Engineering
Don Bosco College of Engineering, Fatorda-Goa



**DON BOSCO COLLEGE OF ENGINEERING
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ENGINEERING
GOA**

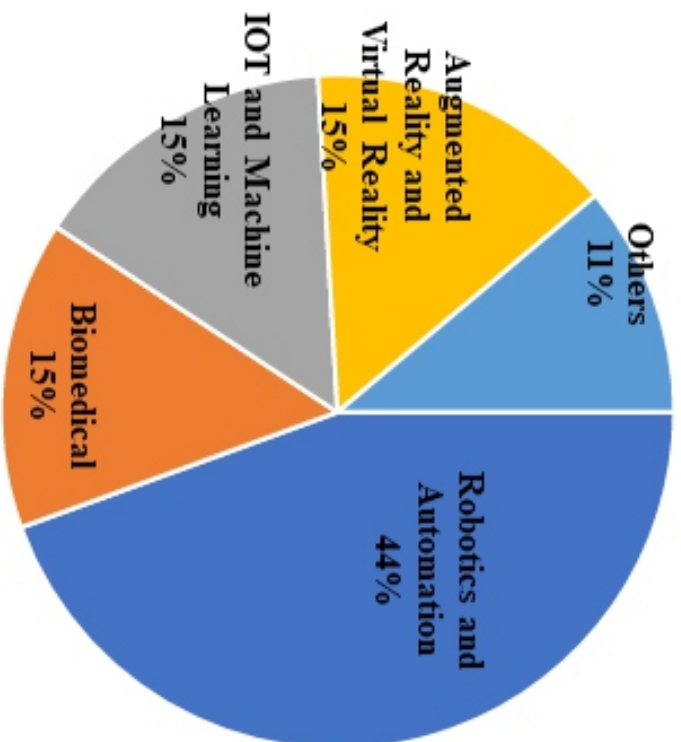
2021-2022



**“Ankur 2k22”
..... budding ideas**

*Concept and Guided by Dr. Varsha Turkar
Edited and Designed by: Asst. Prof. Anisha Cotta and Asst. Prof. Melba D'souza*

Project Domains (2021-2022)



- Robotics and Automation
- Biomedical
- IOT and Machine Learning
- Augmented Reality and Virtual Reality
- Others

CONTENTS

1. Robotics and Automation

- 1.1 Caretaker Robot for Hospitals
- 1.2 Solar Based Grass Cutter Robot
- 1.3 Wall Painting and Designing Robot
- 1.4 Glass Cleaning Robot for High Rise Building
- 1.5 Autonomous Cleaning Bot with Smart Bin
- 1.6 Pet Care Bot
- 1.7 Coverage Path Planning and Obstacle Avoidance for Delivery Drone

2. Healthcare

- 2.1 Disease Classification for Retinal Images
- 2.2 Low-Cost Portable Ventilator
- 2.3 ECG Interpretation and Abnormality Detection
- 2.4 Extraction and Detection of EEG Signals
- 2.5 Vending Machine for Medical Kit

3. Internet of Things & Machine Learning

- 3.1 Smart Mirror
- 3.2 Air Quality Monitoring System
- 3.3 Monitoring of Industrial Motors using IOT
- 3.4 Machine Health Monitoring
- 3.5 Plant Disease Detection Using Machine Learning
- 3.6 Automated Clothes Retractor using IoT
- 3.7 Helmet Rule Violation Detection

4. Augmented Reality & Virtual Reality

- 4.1 Augmented Reality in Engineering Graphics
- 4.2 Fun Learning for Pre-School
- 4.3 EduInfoGoa: Goa Education Institutes Information App

5. VLSI

- 5.1 Design and Implementation of Phase Locked Loop IP Core
- 5.2 Implementation of FIR Filter on Field Programmable Gate Array

6. Human Computer Interactions

- 6.1 AI based Chatbot for Restaurants

7. Computer Networks

- 7.1 Network Architecture for Practical Application Using CISCO Packet Tracer

8. Environmental Monitoring

- 8.1 Road Surface Quality Assessment and Speed Control

CARETAKER ROBOT FOR HOSPITALS



Domain/Area of Interest: Robotics

Project Members:

Ms. Amreen Shaikh

Ms. Harshada Gawas

Mr. Niket Naik Shirodkar

Project Guides:

Prof. Mohini Naik

Prof. Yeshudas Muttu

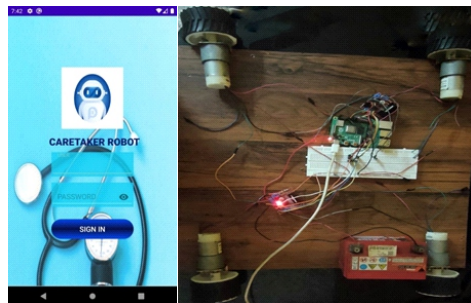
Brief Idea of project:

Elderly and physically feeble people would like to lead an independent and quality life. Some physical or mental assistance may help improve their lifestyle. Today, young people/nurses cannot offer them the attention they require for their engagements, which has a massive impact on their health. All over the world, healthcare is seen as a critical problem. In this project, we will be designing the caretaker robot to develop and regulate the health care management system. The robot will become an assistant to accompany patients during their access to the care service, guarantee personalized care adapted to the user, and optimize the health professional's work without constant supervision. A mobile application(app) development will enable the user to control the robot over the internet and conduct various activities like time monitoring of medications, food, books/magazines, and signals in emergencies. The robot uses a line follower algorithm that allows it to follow a predefined path. Image processing is employed to verify the exact location and objects. The microcontroller is used to provide the requested provisions to patients. It employs three layers of input for route alignment, rotation offset, and obstacle avoidance. We have also designed a Medicine Reminder Box that will be kept near the patient bed, interfaced with the Arduino. At the specific medication time of the patient, the Robot will give instructions to the patient to take medication

Applications:

1. Delivering essential utilities to the patient.
2. Inform the patients of medication time.
3. Reduce the workload of the medical assistance

Working Model:



SOLAR BASED GRASS CUTTER ROBOT



Domain/Area of Interest: Robotics

Project Members:

Mr. Deviprasad Shetty

Mr. Janardhan Velip

Mr. Sahil Sawant

Project Guides:

Prof. Trima Piedade

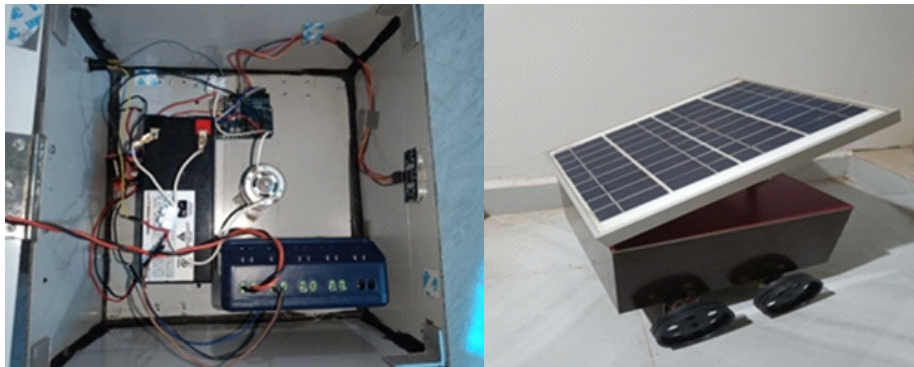
Fernandes e Fizado

Prof. Kimberly Morais

Brief Idea of project:

There has been a lot of upgradations in technologies like Artificial Intelligence, Machine learning, CLOUD, Internet of things etc., resulting in a rapid growth. Grass cutters are normally used everywhere to cut or shape grass. These grass cutters are controlled manually. Manual grass cutting requires man power, time and it may create non-uniform structure of grass height. Hence to avoid all these issues it was essential to create a system which can cut the grass without any human involvement.

Using ultrasonic sensors, or infrared sensors (IR), the grass cutting mechanism is done automatically, considering the obstacle distance which is provided by ultrasonic or IR sensors. This project implements the grass cutting robot which has a battery that can be charged by solar energy. This robot can be operated using android phone. This system can be created with minimum cost as compared to other existing systems. This is rugged, durable and maintenance free. This system is pollution free due to the use of solar energy to charge the battery. The grass cutters which use fuel can be ruled out so as to save fuel and also provide an eco-friendly machine by using this automated grass cutter. By using hybrid solar panel and battery we can store the power collected by sun and use it in cloudy days.

Working Model:

AUTO WALL PAINTING AND DESIGNING ROBOT



Domain/Area of Interest: Robotics and Automation

Project Members:

**Ms. Shraddha Sawant
Mr. Devendra Hundre
Ms. Neha Nayak**

Project Guides:

**Prof. Flavia Leitao
Prof. Priyanka Padiyar**

Brief Idea of project:

Interior wall painting is a common work in construction which consumes a lot of time and human effort. Besides that, paint also contains toxic chemicals that can have serious impact on health of workers. Hence minimum contact between workers and paint can reduce the health risks. This can be achieved by replacing human manual operation with robotic painting to improve the accuracy, efficiency and to reduce the cost.

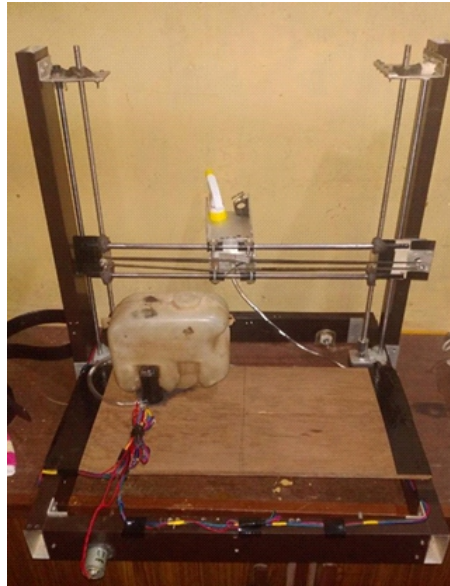
In our project we introduce an autonomous wall painting and designing robot which can paint and design the interior walls of a room, using paint sprayer with the help of a cascade lift mechanism and CNC plotter mechanism for designing purpose.

Applications:

This robot can be used for commercial use as a construction contractor can buy one Auto Wall Painting and Designing Robot in place of numerous skilled wall painters and designers as labours. Being a robot, it can complete the work faster and with high accuracy. It can also be used for domestic purpose by people to paint and design their own house as per their requirements and convenience.

Awards and Participation:

THINKTECH 2021

Working Model:

GLASS CLEANING ROBOT FOR HIGH RISE BUILDING



***Domain/Area of Interest:* Robotics and Automation**

Project Members:

Mr. Eshan Korgaokar

Mr. Sanket Dessai

Mr. Jovsan Fernandes

Project Guides:

Prof. Melba D'souza

**Prof. Trima P. Fernandes
e Fizardo**

Brief Idea of project:

Window cleaning makes the building's architectural glass free from dust and dirt. The traditional way of cleaning office windows cannot be applied to high rise windows with huge sections of glass. Cleaning the windows from outside requires special tools in going up and it's really unsafe. The Window cleaner proposed is an unmanned device which would be controlled by using a wireless device.

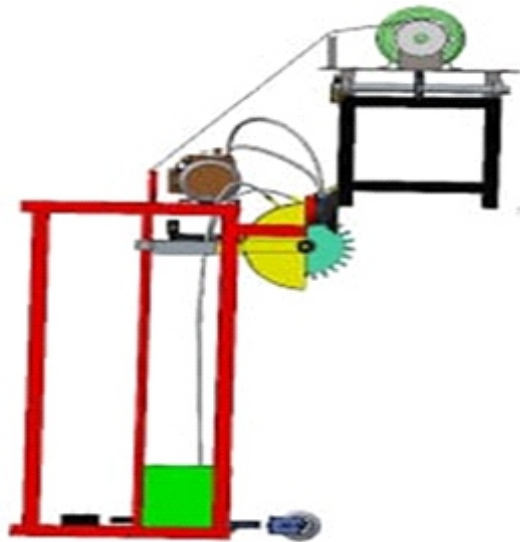
This device would be safer compared to traditional methods of window cleaning in case of high glass structures that increases risk in loss of human life. Structure of the proposed device consists of a frame and uses a wire rope. The movement of the frame over the glass is done by using special rigging wire rope which is gained attached to the roller in which the roller will lift the frame up and down and the brush is attached to the frame. The frame consists of a cleaner brush which is run by motors and controlled remotely with the mobile. The cleaner moves in vertical direction within the frame using the mechanism.

Applications:

1. Cleaning exterior glass surface of skyscrapers efficiently
2. Cleaning large solar panels

Awards and Participation:

Participated for Technix 2022

Working Model:

AUTONOMOUS CLEANING BOT WITH SMART BIN



Domain/Area of Interest: Robotics

Project Members:

Mr. Aaron Fernandes

Ms. Urviya Umesh Taker

Ms. Jwella Dcosta

Mr. Ashutosh Chawan

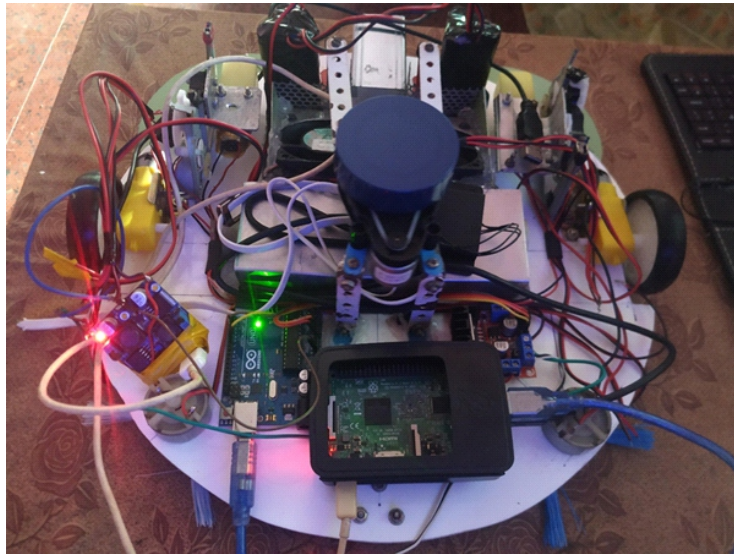
Project Guides:

Dr. Varsha Turkar

Dr. Shreyas Simu

Brief Idea of project:

A 2in1, Vacuum and mopping bot. At the first time it will move about the house and create a virtual map (using LIDAR or ultrasonic) and save for future reference. Then daily navigate over the zigzag pattern covering every corner of the house and it will vacuum and mop simultaneously. However, we will be incorporating the self-cleaning feature where unlike other bots available in market this one won't require user to clean the brushes, it will return back to the cleaning/charging station for self-cleaning the mopping pads and removing the dirt collected. Most of the vacuum bots available in market require hi speed internet connection for mapping but we will make This bot work offline without internet connection basically on-board processing. Once the bot finishes the work It will return to the charging station and automatically charge itself. The time scheduling of the bot to do the task will be done through a mobile application which will be connected to the bot via Android Application.

Working Model:

PET CARE BOT



***Domain/Area of Interest:* Home Innovation**

Project Members:

Mr. Amish Da Silva

Mr. Jovan Fernandes

Ms. Poonam Gaonkar

Project Guides:

Prof. Selvyn Fernandes

Dr. Shreyas Simu

Brief Idea of project:

In today's busy life, there is hardly any time for rest. Different upcoming technologies are claiming to make daily life activities simpler without compromising its speed. Household activities are one of the inseparable parts of daily life. May it be sweeping the floor, turning off electric appliances, everything needs to be automated. Home automation provides a better solution to these types of things.

Pets need care and attention to keep them healthy, happy, and safe. They need healthy food, clean, fresh water; and a comfortable place to sleep. The pet feeding robot is in great need because pet keeping is a time-consuming responsibility and we want to provide convenience to users by helping them feed their pets in their absence.

Applications:

Feeding pets, Surveillance

Working Model:

COVERAGE PATH PLANNING AND OBSTACLE AVOIDANCE FOR DELIVERY DRONE



Domain/Area of Interest: Avionics

Project Members:

Mr. Alpesh Sawal

Mr. Shubham Kolamkar

Mr. Saish Mandrekar

Project Guides:

Prof. Yeshudas Muttu

Prof. Flavia Leitao

Brief Idea of project:

The rapid increase in online ordering has increased the requirement of manpower to deliver in multiple folds. Drone based technology can be used to meet this requirement. A quadcopter can be used for delivery in a specific region which can accelerate the delivery time and reduce human efforts.

Our idea proposes autonomous flight capable UAV for delivering parcels ordered online. The drone can follow the given coordinates to navigate the destination and return to home position. The drone will be able to cover a given area with coverage path planning algorithm along with the obstacle

avoidance. The delivery will be based on detection of some sign on the received coordinates like a special place setup by the customer for the delivery

Once the drone detects the delivery sign on the ground setup by the customer the drone will land on the sign and deliver the package

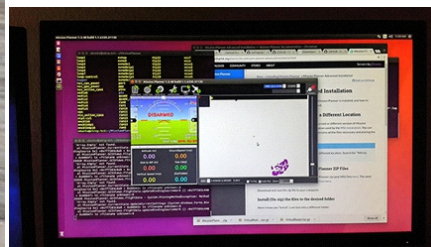
Applications:

1. Delivery of food at the doorstep.
2. Delivery of the medicine at the isolated places

Awards and Participation:

TECHNIX 2022

Working Model:



DISEASE CLASSIFICATION FOR RETINAL IMAGES



***Domain/Area of Interest:* Healthcare**

Project Members:

Mr. Navaneeth. J

Mr. Gandhar Rane

Mr. Sidhant Samant

Project Guides:

Prof. Yeshudas Muttu

Prof. Mathilda Colaco

Brief Idea of project:

The retina of a human eye consists of billions of photosensitive cells (rods and cones) and alternative nerve cells that acquire and arrange visual information. The retina of a human eye is a thin tissue layer on the inside back wall of your eye. The most common retinal diseases are Diabetic Retinopathy, Glaucoma and Age-Related Macular Degeneration. We propose a system wherein we extract blood vessels of the retina to detect eye diseases. We aim to design and consequently implement neural networks to identify the presence of an exudate, and thereby classify it into Different diseases.

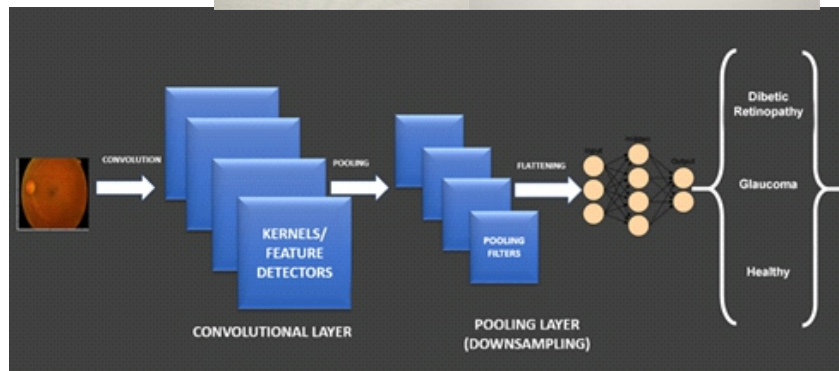
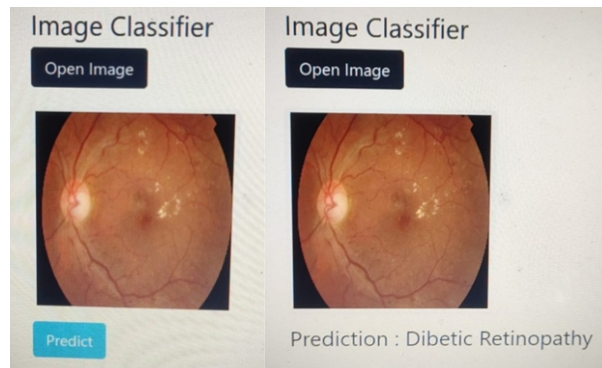
Applications:

1. To detect and classify different retinal diseases.

Awards and Participation:

Technix 2022

Working Model:



LOW-COST PORTABLE VENTILATOR



Domain/Area of Interest: Healthcare

Project Members:

**Ms. Jane Luenna Fernandes
Myola Jovita Dias
Ms. Skylia Angslete Estiberio**

Project Guides:

**Prof. Trima Piedade Ms.
Fernandes e Fizado
Prof. Anisha Cotta**

Brief Idea of project:

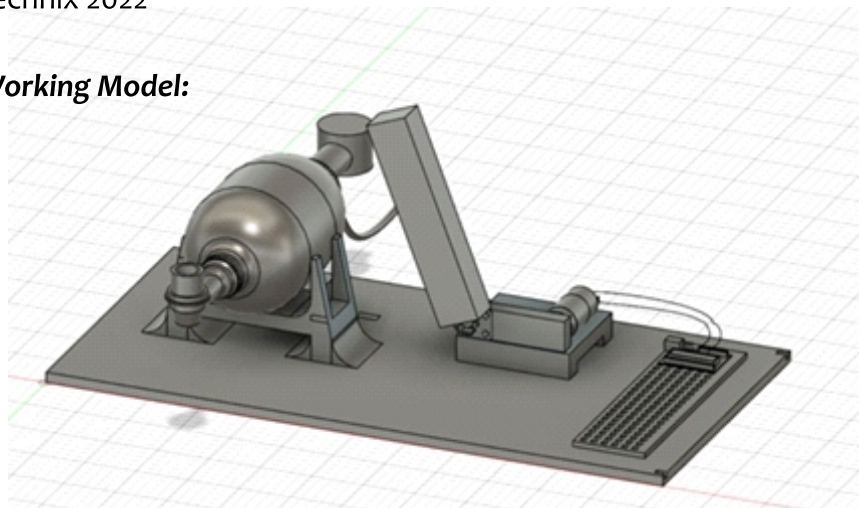
The COVID-19 pandemic has produced critical shortages of ventilators worldwide and the target was to build a device that serves the same purpose as the mechanical ventilators but of a low cost. This project is based on the development and validation of a simple, portable and low-cost ventilator which overcomes few limitations offered by the mechanical ventilators. The device is very simple to operate so anyone with less experience will be able to operate it with ease. It is portable, solar powered and rechargeable battery operated Ambu bag compressing machine, which sends real time cloud messages to the doctors and other medical authorities about the patient. This prototype displays the output on the LCD screen. The shortage of ventilators is met effectively by developing this project. This project is a low cost yet effective ventilating system for the people affected with COVID-19 and other respiratory diseases.

Applications:

Hospitals, Corona virus quarantine coaches, isolation wards and rural areas as well

Awards and Participation:

Technix 2022

Working Model:

ECG INTERPRETATION AND ABNORMALITY DETECTION



***Domain/Area of Interest:* Healthcare**

Project Members:

Mr. Muktesh Nayak

Mr. Leston Silva

Mr. Ashton Vaz

Project Guides:

Prof. Mathilda Colaco

Prof. Deron Rodrigues

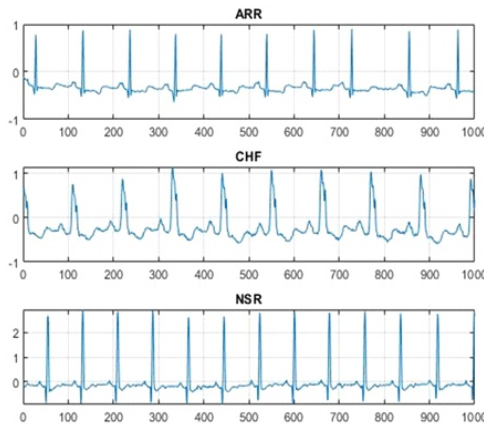
Brief Idea of project:

Cardiovascular diseases (CVD) are the leading cause of death globally. An Electrocardiogram (ECG) is defined as a test that is performed on the heart to detect any abnormalities in the cardiac cycle. The classification of the electrocardiogram (ECG) signal has a vital impact on the identification of heart-related diseases. This can ensure the premature finding of heart disease and the proper selection of the patient's customized treatment. In this project, we have proposed an efficient method to classify the ECG signal into normal and abnormal as well as classify the various abnormalities. Discrete wavelet transform (DWT) is used for preprocessing and feature extraction purposes and neural network classifier to classify different diseases. MIT-BIH ECG database acquired from physionet.org is used for analysis purpose. One cardiac cycle in an ECG signal consists of the P-QRS-T waves. This process allows the analyses on the characteristics of each QRS complexes, T waves and P waves.

Applications:

1. It indicates the rate and rhythm or pattern of contraction of heart.
2. It gives a clue about the condition of heart muscle and is used to diagnose heart disorders.
3. It can also reveal irregularities in heart's rhythm known as 'arrhythmia'.

Working Model:



EXTRACTION AND DETECTION OF EEG SIGNALS



***Domain/Area of Interest:* Healthcare**

Project Members:

Mr. Siddhant Satardekar
Mr. Mohit Naik
Mr. Joshua Pereira
Mr. Aga Fateha Mohammad

Project Guides:

Prof. Anisha Cotta
Prof. Yeshudas Muttu

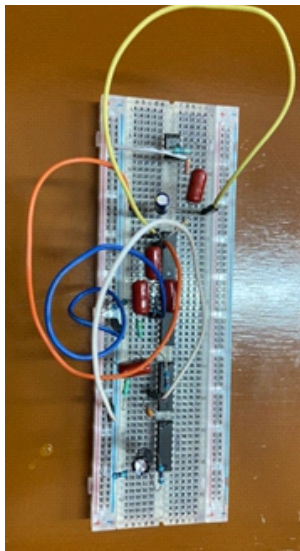
Brief Idea of project:

This project is all about the extraction & detection of EEG signals. It's a transportable biomedical recorder that won't to detect the symptoms like epilepsy. Epilepsy could be a neurological disease that affects many people around the globe, affecting children, adults, and older adults. Epilepsy occurs irregularly and unpredictably manner because of the temporary electrical phenomenon of the brain. For the detection of convulsion encephalography (EEG) is finished as a clinical approach. Designing an EEG circuit for extraction and detection of EEG signals. To detect EEG signals dry EEG electrodes (AgCl) are used and brain signals are obtained i.e. Alpha, Beta, Delta, Theta, and monitoring these signals by performing mental tasks.

Applications:

Portable EEG system with data logger to detect EEG signals

Working Model:



VENDING MACHINE FOR MEDICAL KIT



Domain/Area of Interest: Medical and Health care

Project Members:

Mr. Ahmed Chiragoddin Shah

Mr. Rajiv Baracho

Mr. Willy Rodrigues

Project Guides:

Prof. Anisha Cotta

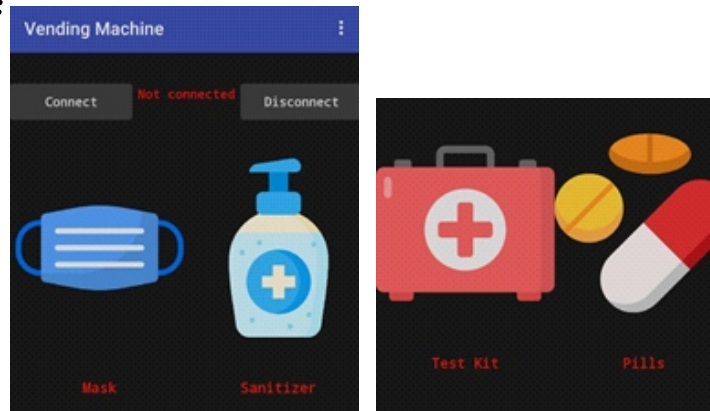
Prof. Selvyn Fernandes

Brief Idea of project:

A vending machine is a device that is used to dispense materials like cold drinks, chocolates, beverages etc. out of it when inserting a coin. Here we are trying to design this machine for medical use by making it dispense materials like masks, gloves, pocket sanitizer bottles, and a whole PPE kit to the people without any physical contact. Our aim is to develop an easier method for people to safeguard themselves from the ongoing pandemic crisis. This machine can serve well in places like hospitals, airports, education centers, general stores etc. where people can have an easy access to the COVID safety materials. Since the device is completely contactless, to access the items one needs to show the palm waving gesture in front of it and the items will be dispensed. Now there will be multiple gesture sensor depending upon the number of items offered by the machine. For example, if the machine is designed to offer three items there will be three sensors. So, user wanting a particular item will have to wave his hand in front of that sensor to access that product. Moreover, the machine will keep track of stock of items in it and will display real-time products available.

Applications:

Can be used in various fields for product selling. Here we aim to use it in medical purpose to dispense products like masks, sanitizers, tablets etc.

Working Model:

SMART MIRROR



***Domain/Area of Interest:* Internet of Things**

Project Members:

Ms. Sunaina Kharangate

Mr. Amir Thapa

Mr. Alister Rumancio Costa

Project Guides:

**Prof. Michelle Araujo e
Viegas**

Prof. Samantha Cardoso

Brief Idea of project:

Every morning our day begins by watching ourselves in the mirror. We interact with it psychologically to find out how we look and how our attire is. Smart mirror is one of the applications of Raspberry pie. While looking at the mirror you can look at various notifications from social sites as well as news, weather forecast and etc. This mirror can be programmed to work as AI and control home appliances by voice input or touch screen. The raspberry pie is connected to monitor as well as it also has inbuilt Wi-Fi and Bluetooth interfaces so we can just swipe music and videos to mirror.

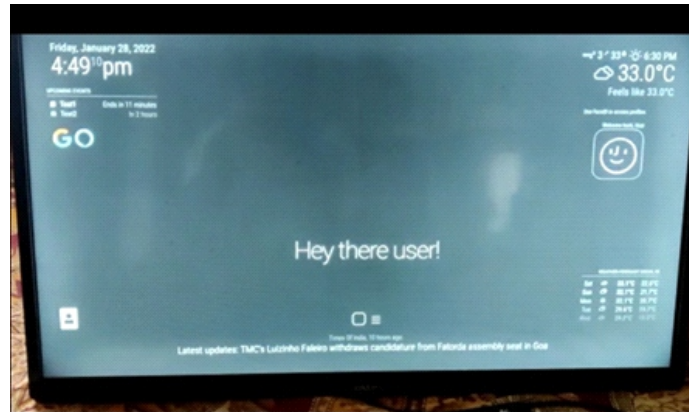
Applications:

1. Hidden TV Bathroom Vanity
2. Voice Activated Magic Mirror
3. Hidden Security Camera
4. Home Monitoring & Security
5. Workout Mirror

Awards and Participation:

1. ThinkTeck 2k22
Technix 2022

Working Model:



AIR QUALITY MONITORING SYSTEM



Domain/Area of Interest: : IoT and Machine Learning

Project Members:

Mr. Utkarsh Bokade

Mr. Saish Karmali

Mr. Alric Carvalho

Project Guides:

Prof. Kimberly Morais

Prof. Melba D'Souza

Brief Idea of project:

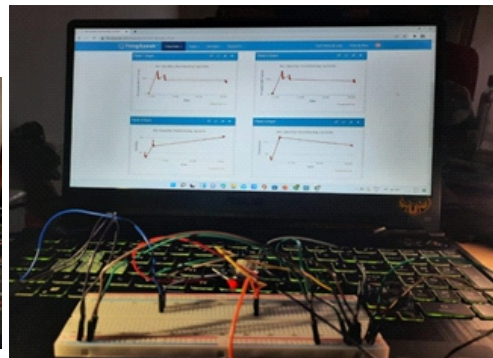
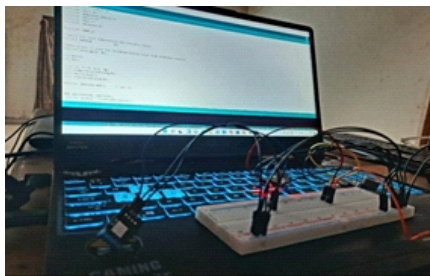
Detection and measurements of contents of atmosphere is becoming increasingly important. A real time air pollution monitoring system is proposed using various sensors to monitor the pollution levels of various pollutants and to send the data to the designed application on the phone. The system helps to check the pollution level of any location on the phone via the application. The project intends to monitor the air quality by tracking the air quality index with the help of this air quality sensing system.

Applications:

1. Companies can track the air quality index around their manufacturing units and subsequently control their emission rates.
2. Detection of Corrosive particles and gases present in the atmosphere which act as a catalyst for rusting and decomposition of the metal body of various industrial equipment.
3. The indoor air quality monitoring system helps companies to build a healthier working environment by keeping the AQI under control. Thus preventing diseases such as asthma, decreased lung function, and even cancer.

Awards and Participation:

1. Technix 2022

Working Model:

MONITORING OF INDUSTRIAL MOTORS USING IOT



***Domain/Area of Interest:* Internet of Things**

Project Members:

Mr. Aashique Phadate

Mr. Vishwesh Naik

Mr. Vaig Fernandes

Mr. Ved Prabhudessa

Project Guides:

Prof. Priyanka Padiyar

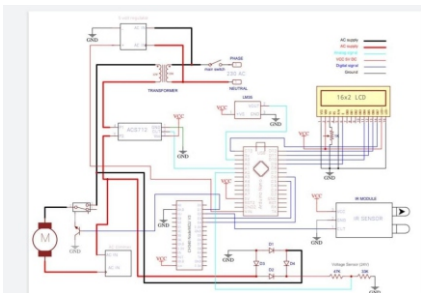
Prof. Kimberly Morais

Brief Idea of project:

In present era, induction motors are used extensively in commercial processes. It runs in any setting and is fairly affordable. This research provides information about how to incorporate an Internet of Things (IoT)-based remote control as well as monitoring device for an induction motor in enterprises, resulting in safer and more cost-effective conditions. Temperature, speed, voltage and induction machine load current and are all monitored by the transducer modules and sensors, which are then sent to the processing unit. The processing unit communicates with the gateway module to transfer data to a cloud data base for remote monitoring. It also includes an industrial programme for making the device more user-friendly and quicker.

Applications:

1. To monitor and control an induction motor based on internet of Things (IoT) for safe and economic data communication in industrial fields.
2. To start or stop the induction machine to avoid system failures by Automatic and manual control methods.
3. To develop an IOT system that measures various parameters of motor with sensors and sends this data into cloud.

Working Model:

MACHINE HEALTH MONITORING



***Domain/Area of Interest:* Internet of Things**

Project Members:

Mr. Byron Fernandes

Mr. Saideep Rudwa

Mr. Purnank Gavle

Project Guides:

Prof. Samantha Cardoso

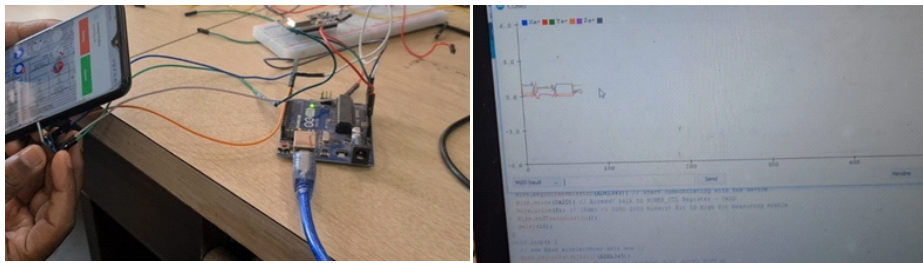
Prof. Selvyn Fernandes

Brief Idea of project:

Machine health monitoring is a form of vibration analysis, with the development of science and technology. A reliable machinery condition monitoring system is very useful to a wide array of industries to recognize an incipient machinery defect so as to prevent machinery non-fatal failure, malfunctions, or even catastrophic failures. An early fault warning can enable the establishment of a predictive maintenance program. Nowadays modern industries' machines have been upgraded, advanced and refined, at the same time this makes the maintenance of these machines frequently. If the bigger equipment gets faulty it will have big impact on the production. or loss for the factory. Knowing the most important faults and having the proper fault detection technique, the problem can be solved without spending time and money. In rotating machines, we don't know what fault may be there. Presently, there are many wired monitoring tools being developed successfully for vibration analysis. But this has some limitation to use, in complex condonation it difficult to use and if at all adopted, the cost of the equipment is high. Therefore, maintenance cannot be done as per requirement.

Applications:

Can be used to monitor health of machines with the help of vibrations produced by the machine itself.

Working Model:

PLANT DISEASE DETECTION USING MACHINE LEARNING



***Domain/Area of Interest:* Machine Learning &
Image Processing**

Project Members:

Ms. Sufiya Ali

Ms. Ayshwarya Karapurker

Ms. Vanisree Hagargi

Project Guides:

Dr. Varsha Turkar

Prof. Priyanka Padiyar

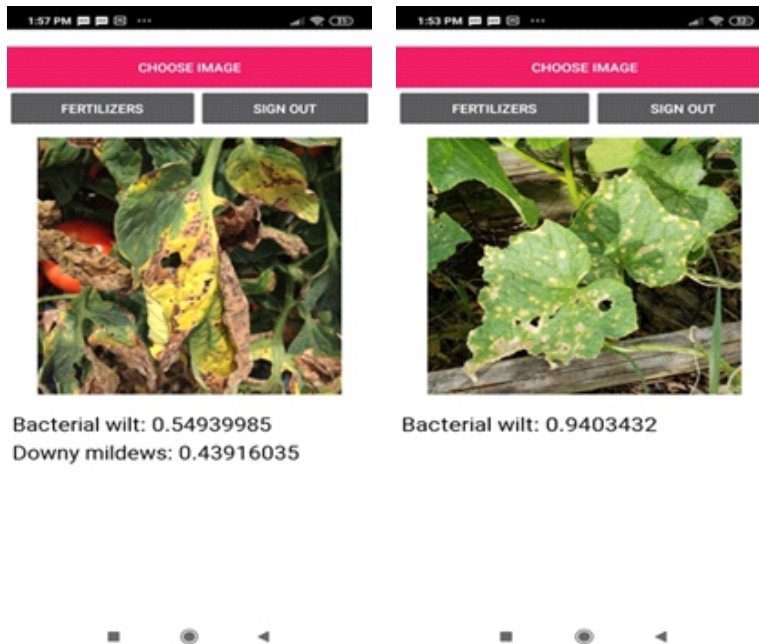
Brief Idea of Project:

This project covers a potential solution to reduce the wastes caused during production stage due to plant diseases. The existing methods to detect a plant disease are to simply observe by experienced farmers or experts. In case of a large plantation, a considerable team of experts is required to examine the plants which increase the overall cost and time required. The proposed system facilitates in predicting the diseases using image processing and other techniques which makes the detection process faster and easier, it also assists the new farmers in detecting the diseases.

Applications:

- 1. Agriculture
- 2. Education

Working Model:



AUTOMATED CLOTHES RETRACTOR USING IOT



***Domain/Area of Interest:* Internet of Things**

Project Members:

Mr. Deep Gawli

Mr. Shaunak Aglotkar

Mr. G Saagar

Project Guides:

Prof. Samantha Cardoso

Dr. D.S.Vidhya

Brief Idea of project:

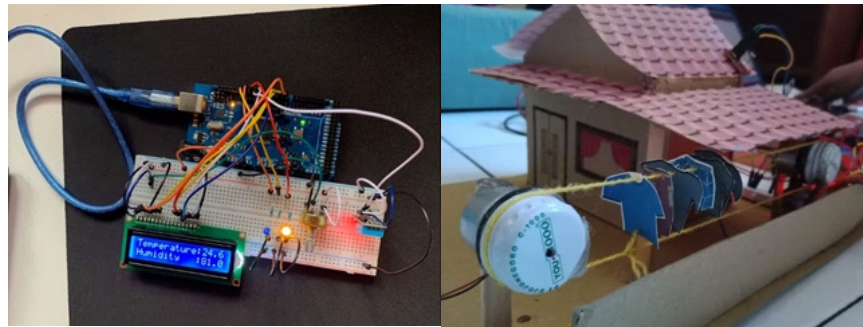
In the advancement in technology of providing a Eco friendly and time saving system we come across an Automated clothes retractor using lot. The Project focuses on the development of an automated clothes retractor that can work in various condition by using Rain sensor, Light sensor and timer. The main advantages of this Automated Clothes Retractor system is it's user-friendly, helpful for people to dry their Clothes. It reduces the human activity and save lot's of time. This designed Retractor machine is also equipped with a Shed which will not allow the clothes to fall down while moving in and out. To avoid collision a gap is maintained between two clothes present. The automated Clothes retractor can be used in homes, Laundry and Flat's.

Applications:

It can find its application in laundry system where large amount of Clothes can dried up without Human intervention. It can also be helpful for Household, Flat System

Awards and Participation:

ThinkTech 2k21 finalist

Working Model:

HELMET RULE VIOLATION DETECTION



Domain/Area of Interest: Robotics

Project Members:

Ms. Jyoti Kumari

Mr. Vishwam Pai

Mr. Rajesh Lotliker

Project Guides:

Prof. Deron Rodrigues

Prof. Mohini Naik

Brief Idea of project:

An Automatic helmet detection system which will make use of Yolov5 algorithm for helmet detection. The helmet detection will be based on live footage via CCTV or any video recording device. After detection of helmet the system will make use of OCR (Optical Character Recognition) to extract the corresponding number plate of helmetless rider. After extraction of number plate an e-challan will be sent to the violator.

Applications: The system will be implemented in all CCTV cameras on the road. An automated system which detects the number plate of the violator and sends e-challan. A counting system which counts the number of people who have violated the rule and gives a monthly report.

Awards and Participation: Thinktech 2021 / Technix 2022

Working Model:



AUGMENTED REALITY IN ENGINEERING GRAPHICS



Domain/Area of Interest: Augmented Reality

Project Members:

Ms. Saili Naik

Ms. Jaitali Kunkalkar

Ms. Priya Kamat

Project Guides:

Prof. Flavia Leitao

Prof. Selvyn Fernandes

Brief Idea of project:

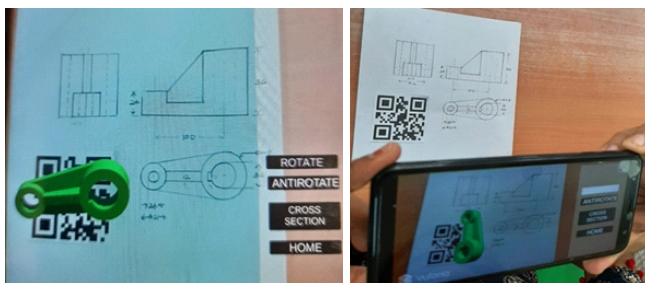
Engineering Graphics (EG) is a subject which helps in developing the ability to create and read the graphical representations of various structures. In Engineering Education, developing 3D structures require spatial ability that is ability to think creatively, critical thinking. In the classroom, lecture durations are short, it therefore becomes hard to clearly visualize the relationship between 3D geometry and their 2D projections. This project aims at providing brief insight into potential of using AR in Engineering Graphics subject. Engineering Graphics designs play vital role in engineering fields in student's life. Augmented Reality (AR) enables the users to comprehend the 3D geometry concepts in much faster way. This AR application enables better understanding of complex spatial problems and relationship which will help students in their studies. This app also provides effective teaching aids for EG courses. Based on the markers, the system generates the 3D object and blends it in the real world.

Applications:

In an Engineering graphics class, it becomes difficult for the students to understand clearly the relationship between the 3D geometry and their 2D projection. Here augmented reality adds virtual content to the real environment. This technology provides attractive and efficient ways to enhance concepts of Engineering Graphics.

Awards and Participation:

1. ThinkTeck 2k21
2. IIC-IDEA PITCHING COMPETITION

Working Model:

FUN LEARNING FOR PRE SCHOOL



Domain/Area of Interest: Augmented Reality

Project Members:

Mr. Gnanesh S

Mr. Amit Ravindran Nambiar

Mr. Sushruth Shirsat

Project Guides:

Dr. Vidhya D.S.

**Prof. Michelle Araujo e
Viegas**

Brief Idea of project:

AR is a technology to integrate virtual object into real world. Through AR we can visually experience it in real world even though it does not exist in reality. AR has been used in different field and when it comes to education it is mostly used in universities. Using AR technology in education can improve students' performance, keep them motivated and increase their engagement in learning. It can also help to improve their creativity, problem solving skills. Using AR app to make the learning fun, interactive and interesting process for preschool students. Making them visually see virtual object can help them learn alphabets and new words. This AR app uses mobile platform which is easy to use and provide better learning experience.

Applications:

Small students can learn at home in an interesting, easy and fun way.

Working Model:

EDUINFOGOA: GOA EDUCATION INSTITUTIONS INFORMATION APP



Domain/Area of Interest: App Development

Project Members:

Mr. Saiesh Naik

Ms. Neha Joshi

Ms. Rosann Godinho

Project Guides:

Prof. Deron Rodrigues

Dr. Varsha Turkar

Brief Idea of project:

To develop an Android compatible application- EduInfoGoa- with the help of Android Studio software. The EduInfoGoa app will categorically classify the educational institutes of Goa based on the user's choice of district, educational level, etc. On selecting a particular institute, the app will display images, contact details and information related to campus infrastructure, achievements, academics, extra-curricular, transportation, etc. using a database. Furthermore, it will also display FAQs, allow users to rate an institute and obtain comparative analysis of institutions. A feature for prediction of admission of a student will also be available. Other features include sign-in, maps, saving an institution for future reference and sharing it on other platforms.

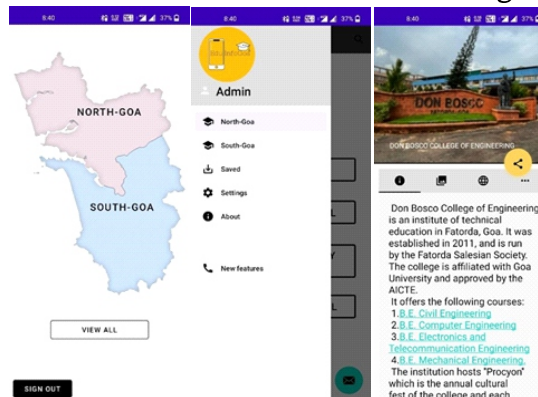
Applications:

1. Acts as an aid to professional migrants who relocate to Goa along with their families in making them aware of the available institutes of the state and the facilities provided by them.
2. Provides guidance to students (especially those of class 10 and class 12) in choosing the right institute and program by providing efficient resources.
3. Promotes the state of Goa as a technologically developing, educational hub rather than just a tourist destination.
4. Allows institutes to promote themselves in a technologically literate manner.

Awards and Participation:

1. ThinkTech 2021
2. TECHNIX 2022

Working Model:



DESIGN AND IMPLEMENTATION OF PHASE LOCKED LOOP IP CORE



Domain/Area of Interest: VLSI

Project Members:

**Mr. Kaushik Naik
Ms. Lyzen Barreto
Mr. Ved Amonkar**

Project Guides:

**Prof. Kimberly Morais
Dr. Vidhya D.S.**

Brief Idea of project:

These days, A Phase Locked Loop (PLL) is the crucial part of all SOC's. PLL is a form of servo loop. Not only does it detect phase error but it also compares phase of output signal with input signal. The block diagram of PLL is made up of phase detector (PD), A Low pass filter (LPF) and A Voltage controlled oscillator (VCO). PD block detects the Phase error. where one input is the reference signal and the other is the feedback signal from VCO output. The VCO generates high frequency.

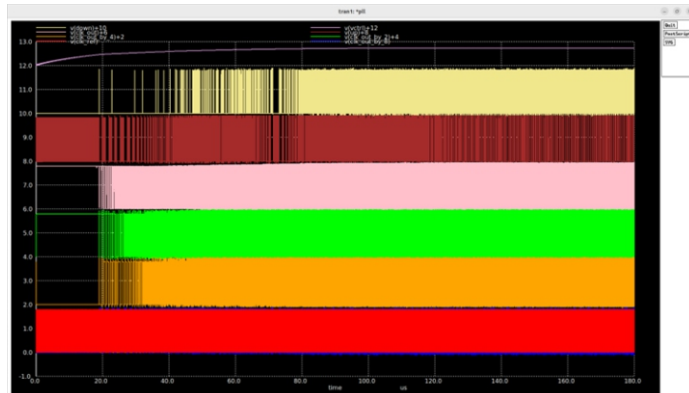
This high frequency is slightly unstable but the frequency of reference oscillator is stable. Schmitt trigger based CSVCO is used in the design of PLL in order to make the frequency stable. A stable frequency output is the main aim. Then the stabilized frequency can be used for synchronization purpose in many applications. The PLL will be designed using SCL PDK and appropriate high output frequency shall be obtained without much power consumption.

Applications:

1. PLL is a circuit block that is used in areas such as AM and FM modulation, Wi-Fi routers, mobile devices and wireless application.

Awards and Participation:

1. ThinkTech 2K21
2. TECHNIX 2022

Working Model:

IMPLEMENTATION OF FIR FILTER ON FIELD PROGRAMMABLE GATE ARRAY



Domain/Area of Interest: VLSI

Project Members:

**Mr. Ishan Prabhu
Mr. Sagar Shetkar
Mr. Sohan Sawant**

Project Guides:

**Dr. Vidhya D.S.
Prof. Melba D'souza**

Brief Idea of project:

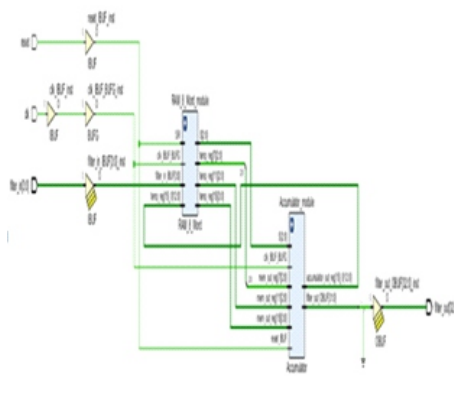
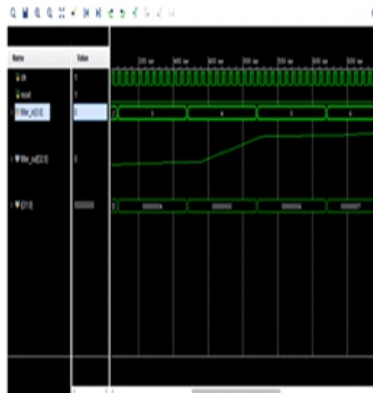
FIR filters are traditionally implemented using ASICs or DSP-processors. FPGA(s) becoming the preferred platform for evaluating and implementing DSP. FIR filters are inherently stable, and hence the question of stability does not arise either in the design or in the implementation of these filters. This project focuses on the implementation of the FIR filter design on FPGA. Implementing FIR filter design using traditional methods has its drawbacks. These drawbacks affect the power, delay time, memory usage and the overall performance. To counter this problem, the Distributed Arithmetic Offset Binary Coding (DA-OBC) algorithm is used. The Distributed Arithmetic and the Offset Binary Coding principles can be used at high speeds and save hardware resources to decrease the circuit scale. The FIR filter is designed using Verilog on Vivado software. The filter coefficients for the FIR filter are generated using MATLAB.

Applications:

1. Improvement in the FIR filters design and overall performance.

Awards and Participation:

1. Technix 2022

Working Model:

AI BASED CHATBOT FOR RESTAURANT



***Domain/Area of Interest:* Human Computer Interaction**

Project Members:

Mr. Xavier David

Mr. Harshavardhan Desai

Ms. Namrata Dessai

Project Guides:

Prof. Deron Rodrigues

Prof. Mathilda Colaco

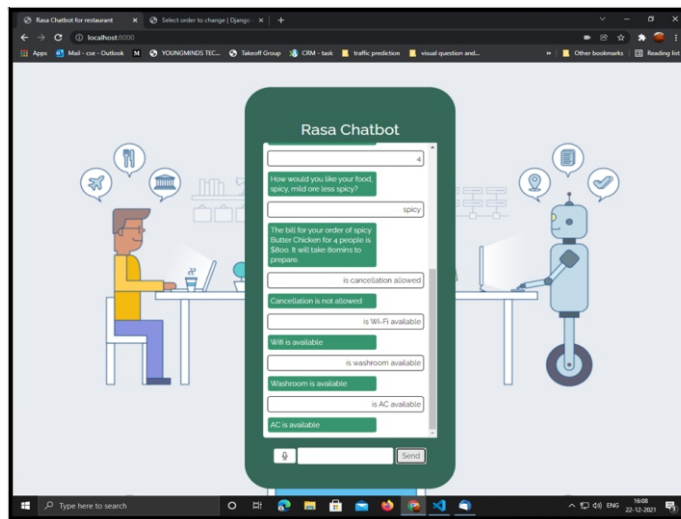
Brief Idea of project:

A Chat-bot is used to conduct an online chat conversation via text or speech, instead of providing direct contact with a live human agent using artificial intelligence. It is software that can stimulate a conversation with a user in natural language through messaging applications, websites or mobile apps. Nowadays a chat-bot is become so robust because Artificial Intelligence brings a human touch in every conversation, it understands the user's query, and triggers an accurate response. This project focuses on creating restaurant chatbot which will help in contactless and instantaneous communication. The main objective of this project is to design and implement a chatbot using Rasa and Python which will help in reducing the dependency of an organization on humans by automating operations.

Applications:

1. 24/7 customer support
2. Answer FAQ

Working Model:



NETWORK ARCHITECTURE FOR PRACTICAL APPLICATION USING CISCO PACKET TRACER



***Domain/Area of Interest:* Computer Networks**

Project Members:

Mr. Deepak Gouli

Mr. Deeptesh Naik Gaonkar

Mr. Atish Naik Gaonkar

Project Guides:

Prof. Melba D'Souza

Prof. Mohini Naik

Brief Idea of project:

Network Architecture is about designing and analyzing different topologies and their architecture. Designing network architecture is important as it helps to develop and improve the network security and the network performance which is essential if we are implementing it in real world. To design a network, we use various components such as routers, switches, and end devices and so on each component of the network interacts and communicates with each other by interchanging data.

The aim of this project is to implement network architecture for College Campus, Office/Organization and Smart city using cisco packet tracer simulation tool, where user can simulate or build and manage the systems for better understanding of the networks.

The tool used is Cisco packet tracer which is a software developed by Cisco that is used to create and simulate a virtual network, basically a wireless network, without the need for any network hardware. The tool used is free of cost and it work with all the operating systems. Cisco packet tracer allow user to have a practical networking knowledge.

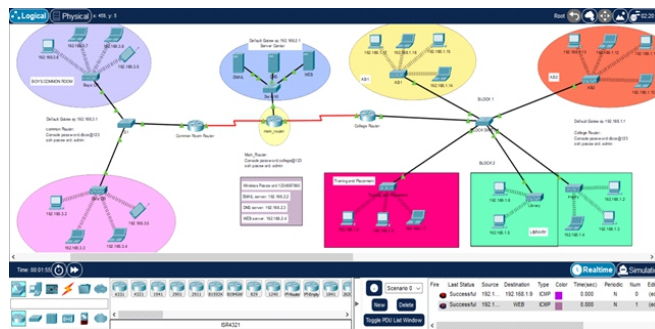
Applications:

Cisco Packet Tracer is Cisco's simulation software. It can be used to create complicated network typologies, as well as to test and simulate abstract networking concepts. It acts as a playground for you to explore networking and the experience is very close to what you see in computer networks.

Awards and Participation:

TECHNIX 2022

Working Model:



ROAD SURFACE QUALITY ASSESSMENT AND SPEED CONTROL



***Domain/Area of Interest: Environmental
Monitoring***

Project Members:

Ms. Deepali Singh

Ms. Dwena Demelo

Project Guides:

Prof. Michelle Araujo e Viegas

Dr. Shreyas Simu

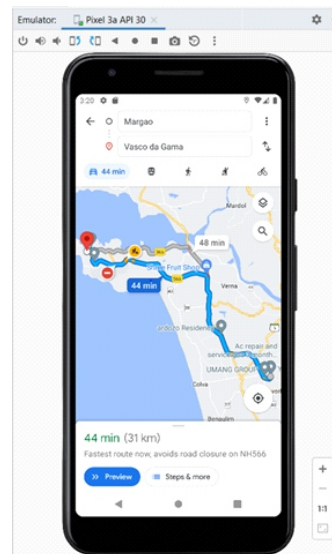
Brief Idea of project:

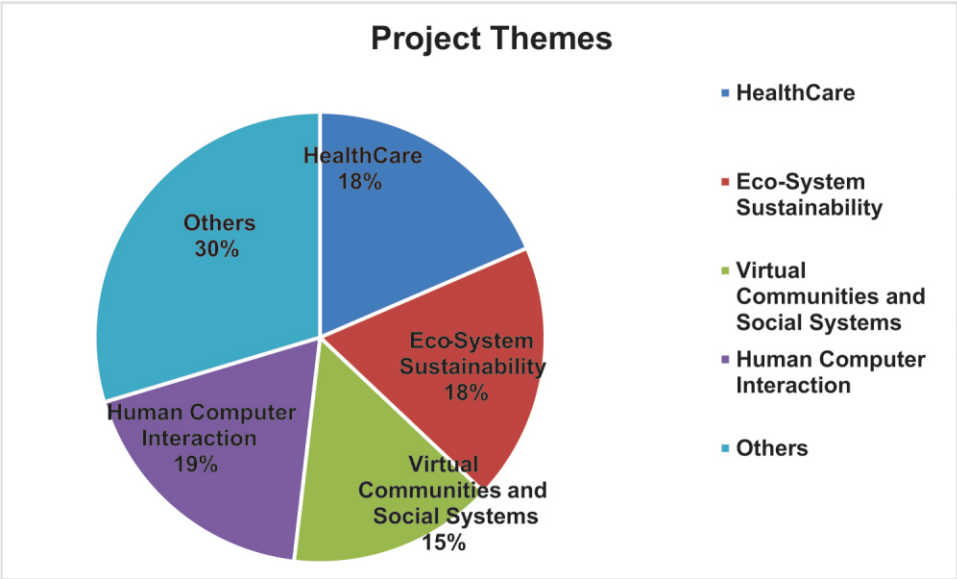
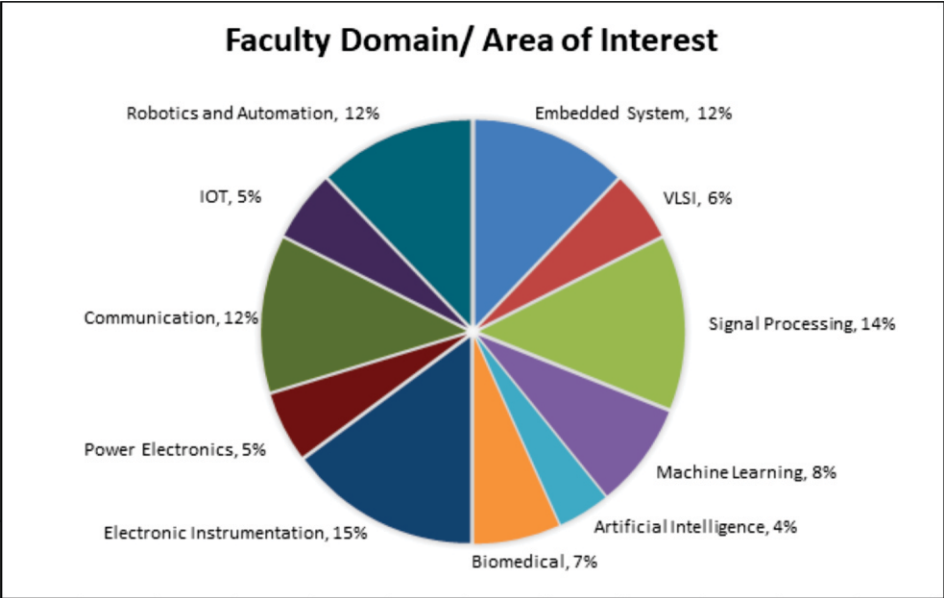
This project will provide an overview of road surface quality using linear potentiometer which will be placed alongside the shock absorber of a vehicle. The linear potentiometer will provide the displacement data of the shock absorber when the vehicle encounters a pothole. This data will be collected and sent via the Nodemcu to the cloud. Now from the cloud the data will be sent to the mobile application (wireless connection) where it will use algorithms to analyse the road surface quality.

The application will use the built-in sensors of the mobile to determine the location and speed of the vehicle and link all the data together to get the required info. i.e., location of the bad road surface. This project will also help in maintaining the speed limits of the vehicle and avoid over speeding. An existing speed limiting device will be used to control the speed of the vehicle. The GPS from the mobile device will be used to locate the vehicle and determine the type of road. I.e., urban roads (40kmph), one-lane highways (60kmph), two-lane highways (100kmph), freeway (100kmph), etc. Depending on the type of road, the app will send the speed limit to the speed limiting device. The app will also give a warning when the vehicle reaches close to the speed limit

Applications:

It will help the user to use a convenient alternate route with less potholes, also notify the user if they exceed the speed

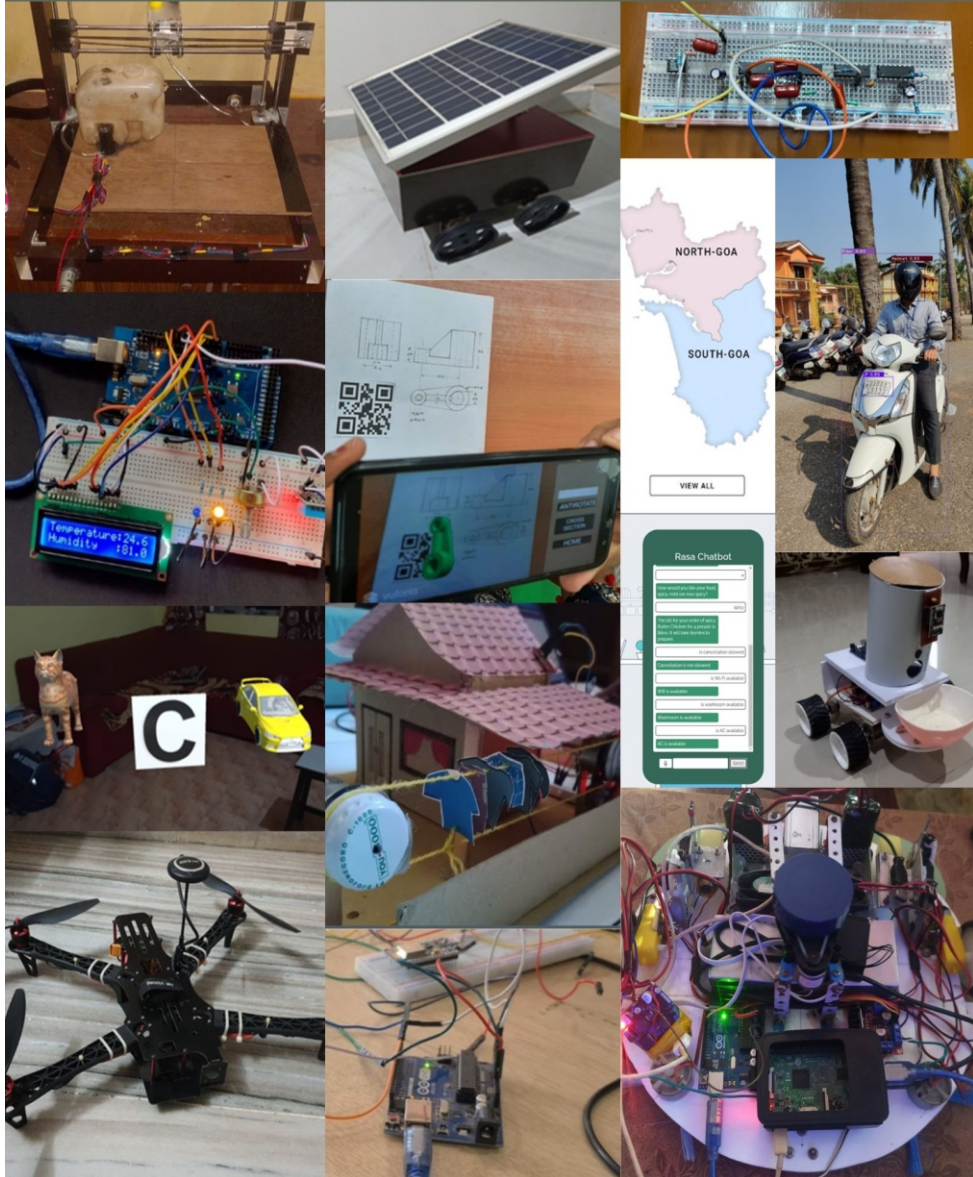
Working Model:



BATCH: 2018-2022
DEPARTMENT OF ELECTRONICS AND
TELECOMMUNICATION ENGINEERING



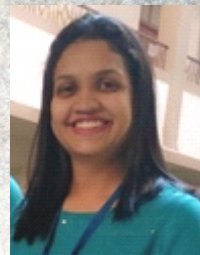
At A Glimpse



It gives me immense pleasure to present to you the third edition of “Ankur”-2022. Fresh hopes of a bright future keep us going on in the post pandemic era. The technological landscape is constantly modifying and improving as each day passes – change is the only constant. “Ankur 2k21” gives an insight into the projects in the latest and upcoming fields such as biomedical, robotics, automation, augmented reality and virtual reality to name a few.

I would like to extend my heartfelt gratitude to our Director, Rev. Fr. Kinley D’Cruz for his unflinching support in all our endeavours. Special thanks to our Principal, Dr. Neena Panandiker for her constant motivation. My gratitude goes out to our HOD, Dr. Varsha Turkar and her support and guidance. The quality of every project exemplifies the hard work and dedication of staff and students of the ETC Department. A special thank you. I look at this humble beginning with a great hope that many more students will catch the fire of innovation and contribute to technology in a big way.

Asst. Prof. Anisha Cotta
Project Coordinator
Dept. of Electronics and Telecommunication Engineering



It is my privilege to have my short note penned down for this issue of our Project Idea Book.

I have been involved with student's project report documentation very closely. Right from providing a semester-long training in a Professional documentation tool: LaTeX, to solving doubts of each project group via Teamviewer, the journey has been a challenging but exciting one! I can proudly say that this time all our project reports are in the same format. I appreciate all the students for showing a lot of interest in learning and getting trained in LaTeX. They are the ones who have converted my efforts into a perfect professional document.

Asst. Prof. Yeshudas Muttu
Final Year Project Report Incharge
Dept. of Electronics and Telecommunication Engineering



It is indeed a happy moment to introduce the project idea book “Ankur 2k22”, a collection of bright concept, innovative software and hardware projects implemented by our final year ETC students.

“Ankur 2k22” gives an insight into the projects in the fields of Machine Learning, IoT, Augmented and virtual reality, Biomedical, Automation, Robotics etc.

I appreciate the efforts of all the students and their guides and wish all the students a great success and career ahead.

I do hope that “Ankur 2k22” inspires the minds of many students, innovators and readers.

Asst. Prof. Melba D'souza
Project Coordinator
Dept. of Electronics and Telecommunication Engineering



**DEPARTMENT OF ELECTRONICS AND TELECOMMUNICATION
ENGINEERING
DON BOSCO COLLEGE OF ENGINEERING, FATORDA-GOA**

VISION

To evolve into a Holistic Learning Hub that moulds technologically proficient engineers in the field of Electronics and Telecommunication; contributing to the global industry and society with Integrity, Ethics and Professionalism as envisaged by Don Bosco.

MISSION

- To impart education abreast with the fundamentals and advances in technology and transform students into globally accepted professionals.
- To foster networking with all stakeholders for promoting technical innovation, research and entrepreneurship.
- To encourage various skill enhancing activities and extra-curricular activities to instill high levels of work ethics and responsibility for a better society.

