INSTITUTE OF ENGINEERING & MANAGEMENT
Good Education, Good Jobs

INNOVATION REPORT
By
IIC IEDC LAB

Project Title: EMERGENCY PROTECTION FOR WOMEN'S SAFETY

Description: Women are less safe and face several security-related difficulties in the modern world. They must endure a variety of trying circumstances and consistently demonstrate their mettle under pressure. Therefore, the government has given social security through laws and regulations for their security and safety purposes. Despite the fact that there are many systems already in place for security purposes, the need for sophisticated smart security systems is growing. A smart security system for women is created to address these issues. This project uses an Arduino controller and sensor to create a safe and secure electronic system for women. In this project, an accelerometer, GSM, and GPS are utilized. The gadget uses an accelerometer to detect movement when the ladies are in danger. The gadget activates when the sensor exceeds the threshold limit and uses the GPS module to determine where the victim is. The victim's location is sent to the registered contact number via the GSM module.
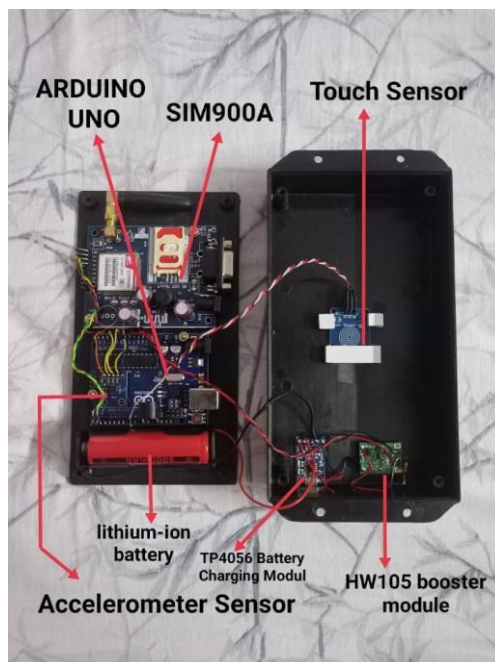
Project Title: MOTORIZED SKATEBOARD

Description: A motorized skateboard, also known as an electric skateboard, is a cutting-edge personal transportation device that combines the thrill of skateboarding with the convenience and efficiency of electric propulsion. It is equipped with an electric motor and a rechargeable battery pack, which powers the skateboard and eliminates the need for pushing or kicking off the ground. Motorized skateboards offer a thrilling and eco-friendly alternative for short- distance commuting and recreational riding. They provide the freedom and excitement of traditional skateboarding while adding the convenience and ease of electric power, making them a popular choice for urban commuters, adventure enthusiasts, and skateboarders looking for an electrifying twist.

Project Title: DESIGN AND DEVELOPMENT OF A 4-in-1 SMART MASK

Description: This automated IOT-based smart mask can sanitize our hands and belongings whenever we hold it within 20 cm in front of that mask with the help of an ultrasonic sensor. Its buzzer also creates a ring whenever there are persons or objects within 3ft to ensure that everyone should maintain a safe distance from each other. This mask also shows the temperature of the p erson wearing it so that any changes in his/her body temperature can be easily identified by other people so that they can take proper safety measures. This mask also offers a triple layer of protection against viruses and pollutants. It can be easily programmed according to our requirements. This mask works on a rechargeable battery and is fully automatic. This mask can be made more compact in the future. This invention deals with a smart mask that will alert us of keeping social distancing, it will sanitize our belongings automatically if within a proper range & it will measure our body temperature and will give a continuous monitoring so that sudden changes can be identified. First of all when we power the Arduino board using an USB cable all the components including the ultrasonic sensor, buzzer and the 5V relay gets it power supply.

There are three batteries 1st is for powering the Arduino board, ultrasonic sensor, buzzer and the relay 2nd is for powering the sanitizer sprayer machine and 3rd for the temperature detector. After successfully switching it on the ultrasonic sensor (HC-SR04) starts to send ultrasonic waves using the transmitter, after getting any obstruction within a particular distance as mentioned in the programmed it reflects back to the receiver. After the sound comes back it sends signal to the Arduino UNO Board for further processing, after the board processes the signal it triggers the required circuit as mentioned in the program like if the range is in 3ft it will trigger the buzzer and if it is 20cm it will send signal to the 5v relay which is connected with the Arduino board where the common is connected to the negative supply of the secondary battery and the normally open pin is connected to the negative terminal of the sanitizer sprayer machine's power supply. If the signal which is reflected back from the object is from 3ft it will switch on the buzzer and if it is from 20 cm it will switch on the buzzer as well as sanitizer dispenser machine. The sanitizer in the container is converted into mist using a mist maker and then it is released for the sanitization purposes. Now coming to the second part of the mask where we have used a temperature detector for detecting our body temperature whenever we wear the mask. There is a sensor inside the mask which collects our body temperature information whenever the mask gets in contact with our body and sends it to the processing and display section for displaying the temperature. There is also a 3 -layer filtration system inside the mask which helps in filtration. This is a rechargeable and automatic mask with few innovative features.

Project Title: IOT BASED FIRE EXTINGUISHER

Description: This is a smart fire extinguisher which can be triggered automatically from any location using the help of internet. Preventing the spread of fire.

# Project Title: LAKSHMAN REKHA SHEILD

Description: This is made for defence purpose. This sheild is electrically charged giving an output voltage of 2500v. This sheild is designed for controlling huge crowds and riots while keeping police officials safe.

Project Title: ATMOSPHERIC WATER GENERATOR

Description: This is a system which produces water from air using compressor. This system can produce water in remote areas depending upon the humidity and weather condition of the specific area.

Link: https://youtu.be/rxJzqlLHSnc
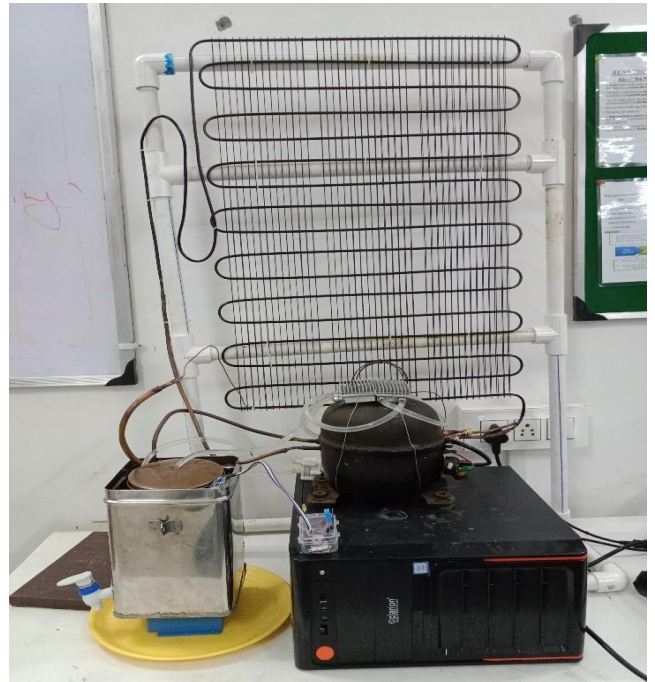
# Project Title: DEVELOPMENT OF SMART ARDUINO BLIND STICK

Description: It is an Arduino-based stick that uses ultrasonic sensors to warn a blind person of upcoming obstacles; it has GPS and GSM modules incorporated for emergency message calling and a water sensor to detect water. It can enhance the protection and enhance the lives of blind people.

Link: **https://youtu.be/JXvOXV-MEts**

Project Title: SMART GARDENING

Description: We can check soil moisture, Temperature and humidity by this device and get all this information in our mobile phone and control the water flow to our plants via our mobile.
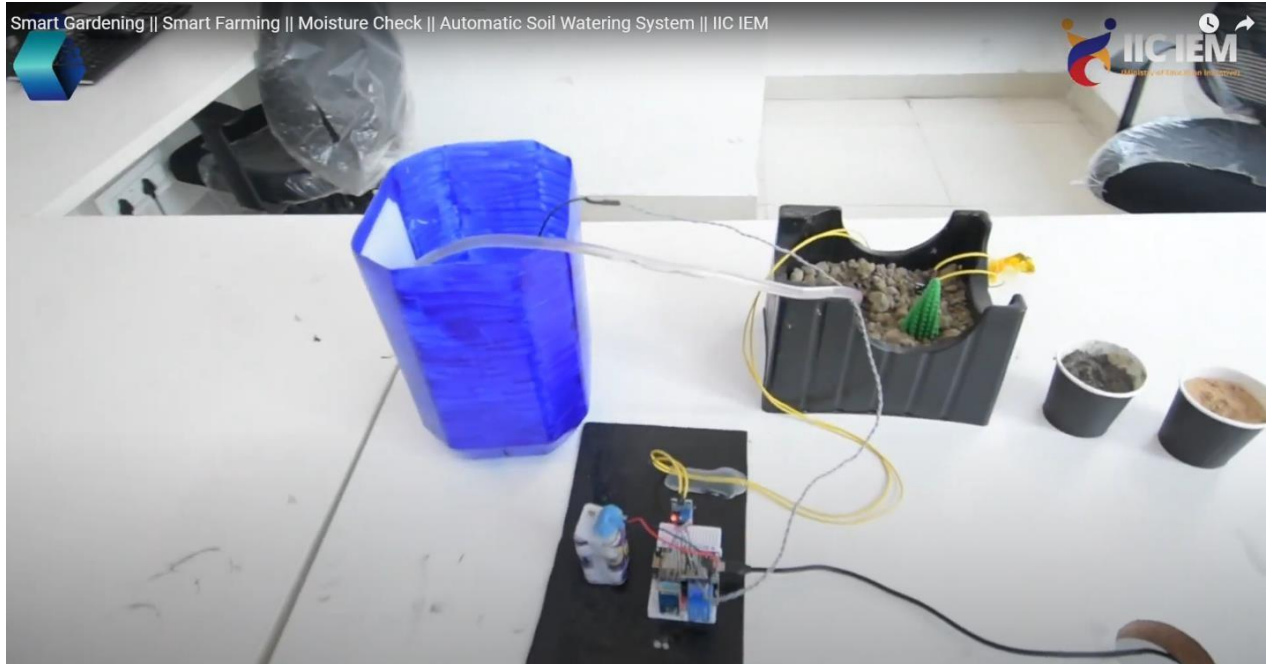
Project Title: ANTI-TREMOR BAND WITH TREMOR STAGE PREDICTION

Description: This device/model thus created is a significant development over the conventional means of controlling tremors and identifying the stage of the tremor according to the patient's nervous system. The primary purpose of this band is to stabilize the handshaking and detect the stage of the tremor using a machine learning algorithm

Project Title: HUMANOID ROBOT

Description: Our project is in the first Phase of humanoid robot. It is an interactive AI based robot, which has the feature of locomotion and greet people with user detection. Here we have used embedded system and Computer vision with machine learning.

Project Title: SMART MIRROR

Description: A smart mirror is a mirror with integrated technology such as a screen, and internet connectivity. The screen can display a variety of information, such as the time, news, weather, and upcoming holidays. With the ability to connect to the internet, the mirror can also display information from other sources, like social media updates or calendar events. The smart mirror can be used in various settings, such as homes, hotels, and offices, to provide useful and convenient information at a glance.
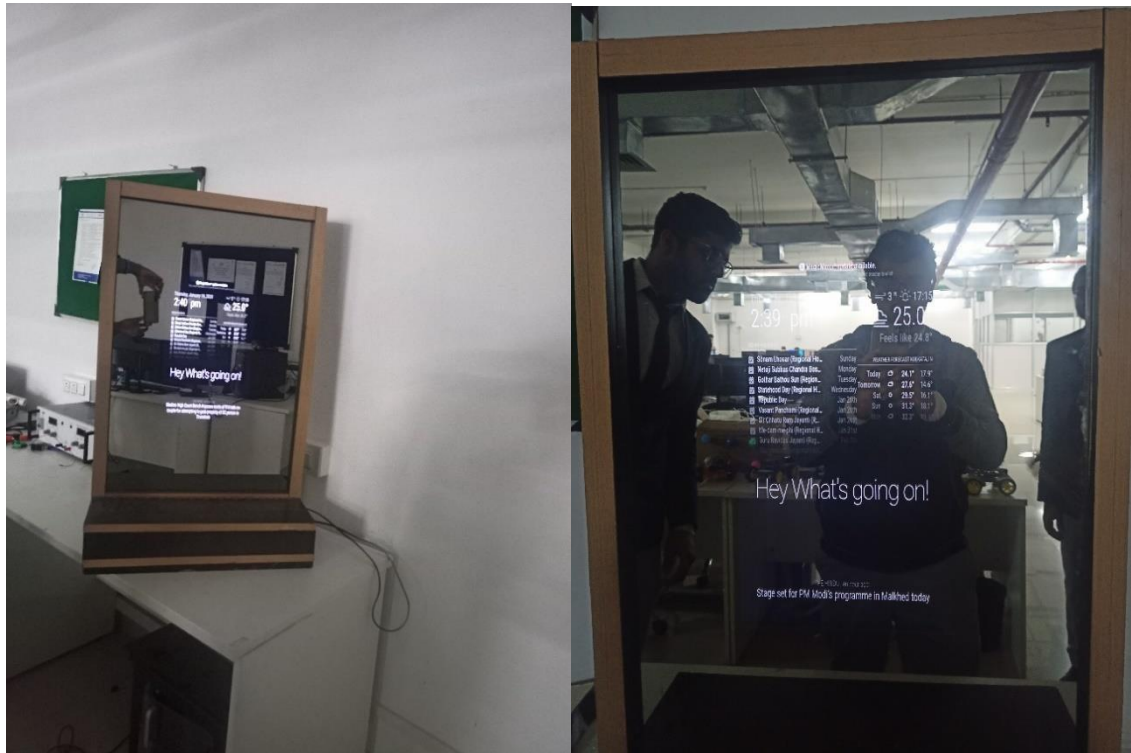
Project Title: ELECTRIC CYCLE

Description: E-bikes are categorized based on the amount of power that its electric motor is capable of producing and the control system, or when and how the motor's power is applied. Rechargeable batteries, electric motors, and some kinds of control are all included in e-bikes. There are several types of battery systems in use, including sealed lead-acid (SLA), nickel-cadmium (NiCd), nickel-metal hydride (NiMH), and lithium-ion polymer batteries (Li-ion).

Project Title: HYBRID MODULAR TREE FOR GREEN ENERGY GENERATION

Description: The presented structure is a low-cost hybrid modular tree that can be used for generating electrical energy. The presented tree can be fitted to the rooftop of any skyscraper and countryside locations pertained by nominal wind speed and solar irradiation. Initially, it has the capacity to generate 25 W DC and it can be further enhanced using more efficient solar modules. Moreover, the vertical structure of the wind turbine makes it more reliable to produce wind power irrespective of the wind direction. As a future scope, this structure can be further modified and widely manufactured to generate more green energy at a large scale.
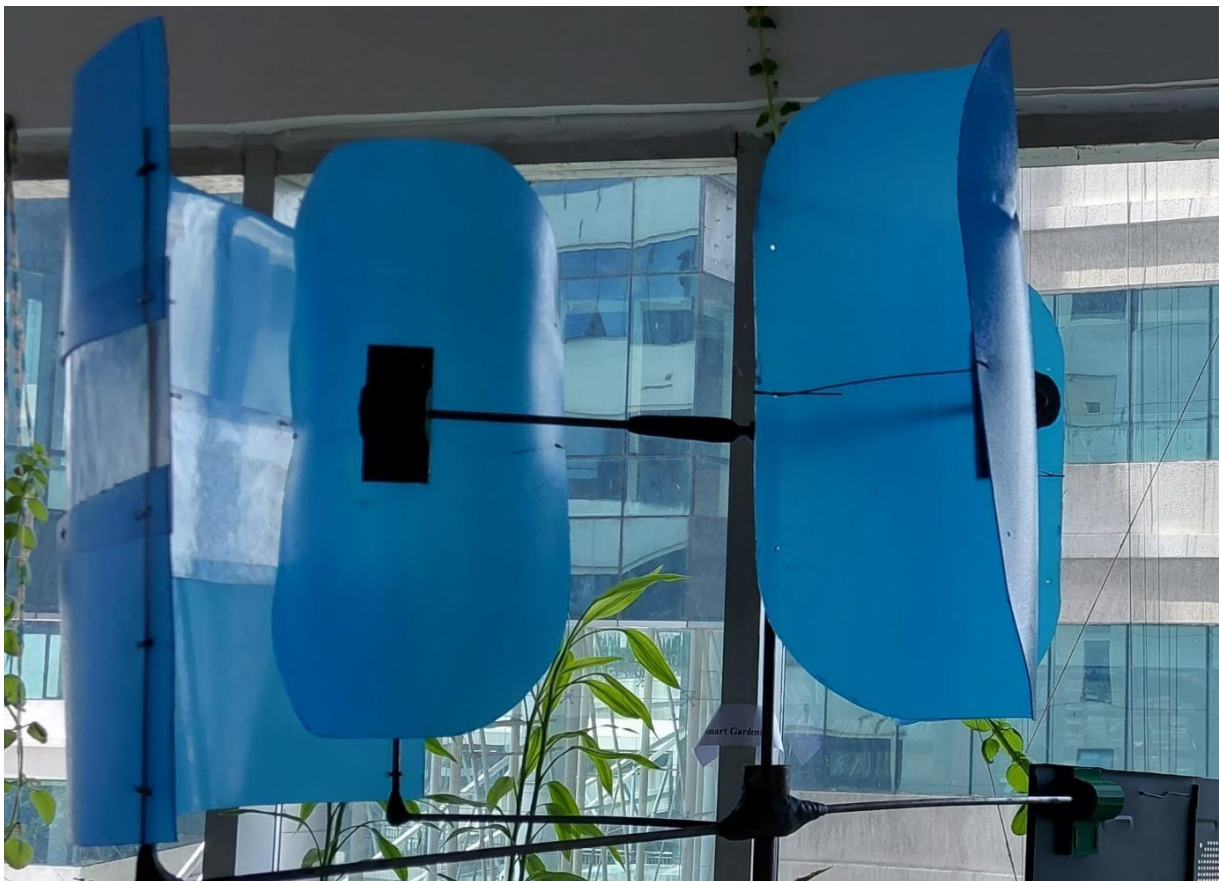
Project Title: MACHINE OVERHEAT DETECTOR WITH ALERT

Description: This proposed system is used to detect temperature of devices that are overheated. This project is very beneficial, especially in places like factories or industries consisting of big machines where it is very necessary to take some action in case the machine is overheated. The system uses a digital temperature sensor in order to detect temperature and pass on the data to the microcontroller. The Atmega 328 microcontroller processes data and sends the temperature to be displayed on an LCD screen. The system uses a 12VDCadaptor to supply power to the system. We can set a limit to the temperature and in case if the system exceeds the temperature limit, an alarm rings to indicate that the system has exceeded the set temperature

Project Title: AERIAL FOREST RANGER

Description: A new drone technology has been developed to aid in conservation efforts and forest fire detection. The drone is equipped with cameras and sensors that can capture live video feeds of animals and detect forest fire signs such as smoke and high temperatures. In case of a fire, the drone can quickly locate the source and transmit the information to the authorities. This technology makes it an efficient tool for monitoring wildlife and protecting natural habitats while providing an early warning system for forest fires.

Project Title: AIR QUALITY REGULATOR

Description: The air in sucked into the air chamber where the gas sensors detect the parameters of the atmospheric air. The parameters are displayed on the Blynk- IOT app with the help of the data streams. The air is then filtered and then again, an MQ135 sensor measures its quality. The air is then sucked out of the air chamber. The voltmeter measures the voltage at all times so as to monitor the voltage. Thus, is to ensure that the voltage does not surpass the limit upto which the components can work efficiently.
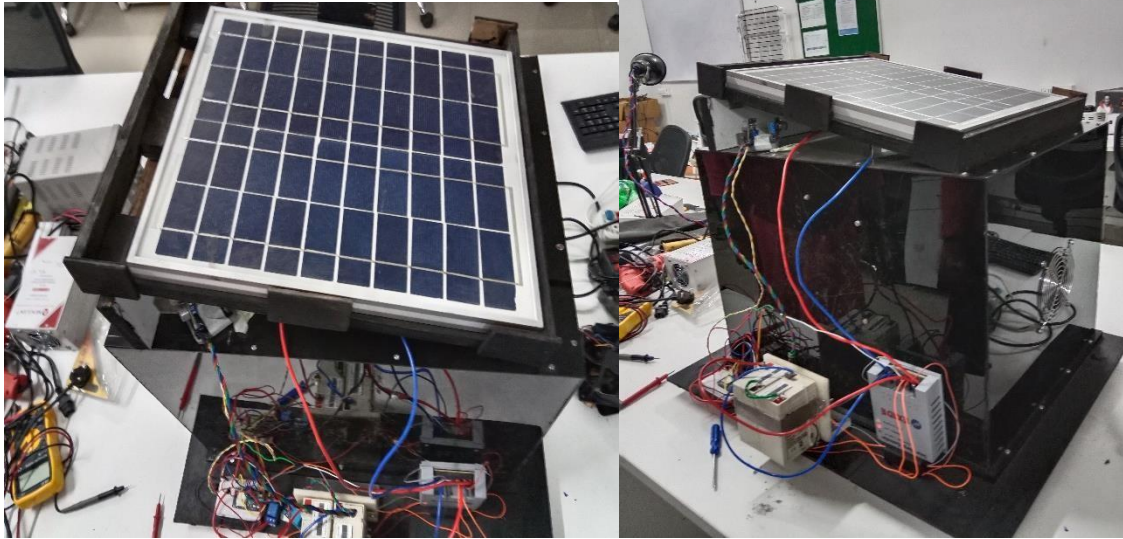
Project Title: FABRICATION OF A TRIBOELECTRIC ENERGY CELL EMPLOYING VARIOUS SOURCES OF WATER

Description: Research and development efforts are being carried out to harvest energy from water in the forms of rain, river tides, and ocean waves. Traditional power generation systems are inefficient and cost-consuming to achieve a high density of electrical energy. As an alternative, utilizing the triboelectric energy generation principle, a device comprising of three components: the upper electrode layer, polymer film (insulating layer), and the lower electrode layer is fabricated to harvest energy from impinging water droplets by using an architecture that comprises a polymer film (insulating layer) on a lower electrode layer plus an upper electrode layer. The impinged water droplet bridges the disconnected components into a closed-circuit electrical system on spreading. The water-droplet-based energy cell works following the principle of contact electrification and electrostatic induction between water droplets and polymer film (insulating layer).
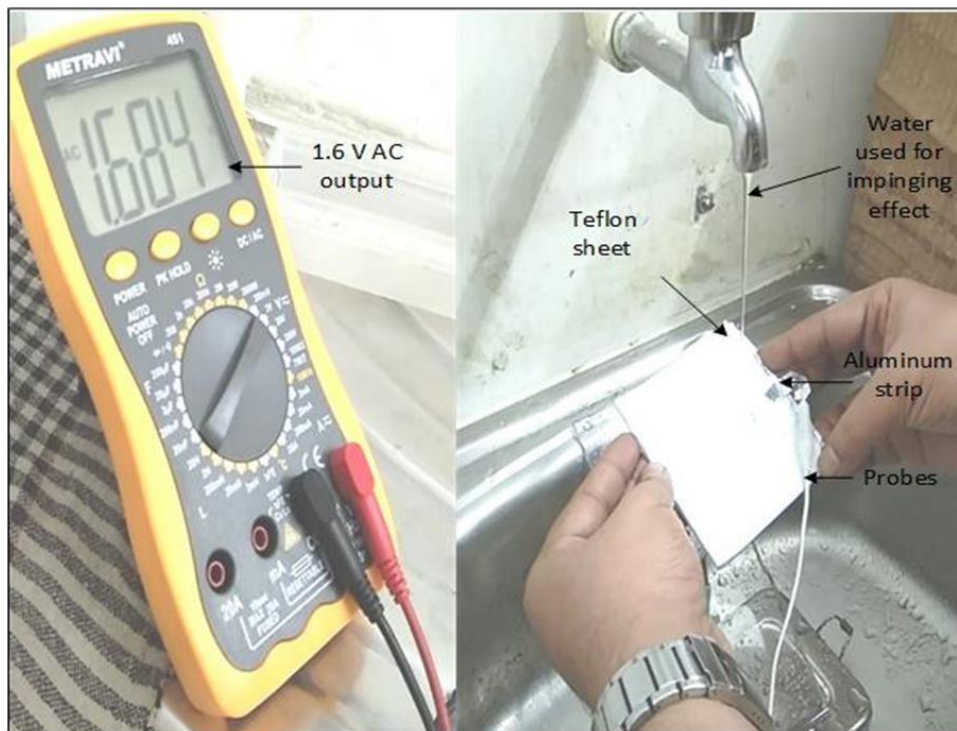
Project Title: CROWD-BASED AIR TEMPERATURE AND VENTILATION CONTROL USING A SMART DEVICE

Description: The present invention is designed and implemented as a smart device to operate an air conditioner's cooling system automatically. By using this device, the proper ventilation of a closed surface area can be maintained. The device can ventilate and monitor the air quality of a room by evaluating the PPM value of at least one noxious gas in the air. The smart device integrates different control units to obtain the desired output. In the present device, the air-quality sensing unit controls the temperature modulation unit and further activates the signaling unit that is used for transmitting the electric pulse to the air conditioner. This sensor-based smart device can keep the air in the closed room clean, and it can also be used to eliminate stuffiness and discomfort. The smart device is also cost-efficient, power savers, portable, and lightweight.
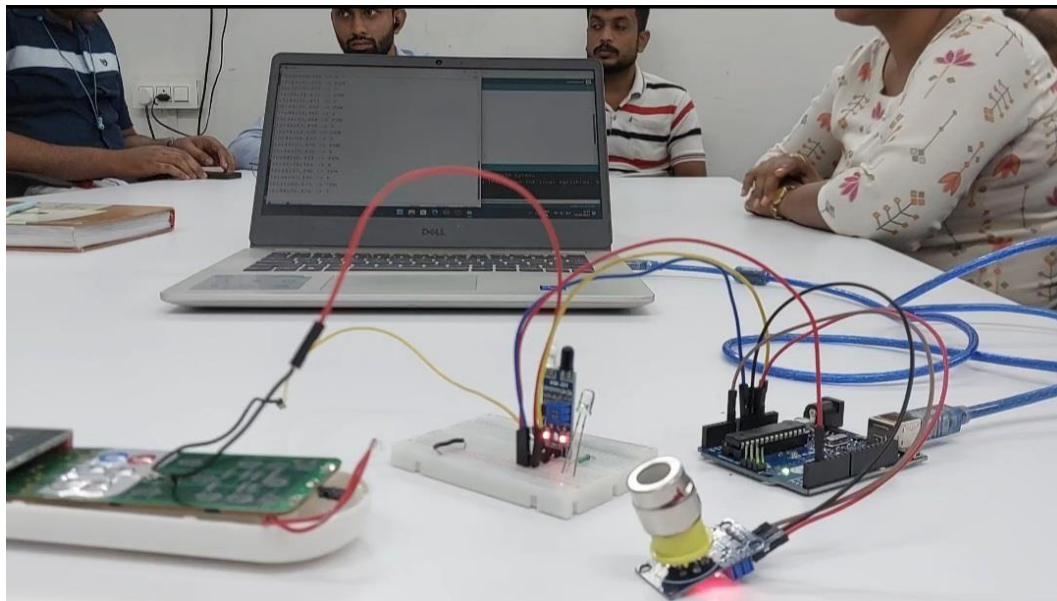
Project Title: WI-FI-BASED SMART PROJECTOR SCREEN

Description: In this modern era, technological advancement has taken a great leap forward in the field of education. People prefer the use of technologies for information sharing rather than books themselves. The projector and its screen are the most used devices for such purposes. As per the project's requirement, the team was required to design and calculate a smart motorized projector screen. Different concepts and ideas were generated and individually analyzed for their reasonability, feasibility, ease of use practicality. At last, an idea was selected among many, and design calculations were done. The final outcome was the Wi- Fi-based motorized projector screen, which was easier to operate. The main advantage was that the mechanism could be used in older projector screens, making it motorized with Wi-Fi control to help users operate through a smartphone.

Project Title: PROSTHETIC ARM

Description: A prosthetic arm is an artificial limb designed to replace a missing or non-functional arm. It is a prosthetic device used to restore upper limb functionality and mobility for individuals who have undergone amputation or have congenital limb differences. Prosthetic arms significantly improve the quality of life for amputees by restoring their ability to perform everyday tasks, such as eating, dressing, and carrying objects. They also enhance independence and confidence in individuals with limb loss, allowing them to engage in work, hobbies, and recreational activities. All the parts of the prosthetic arm, like sockets, joint parts, grippers, hooks etc, are printed using our 3D printer. We will use bio-sensors to control our prosthetic arm.
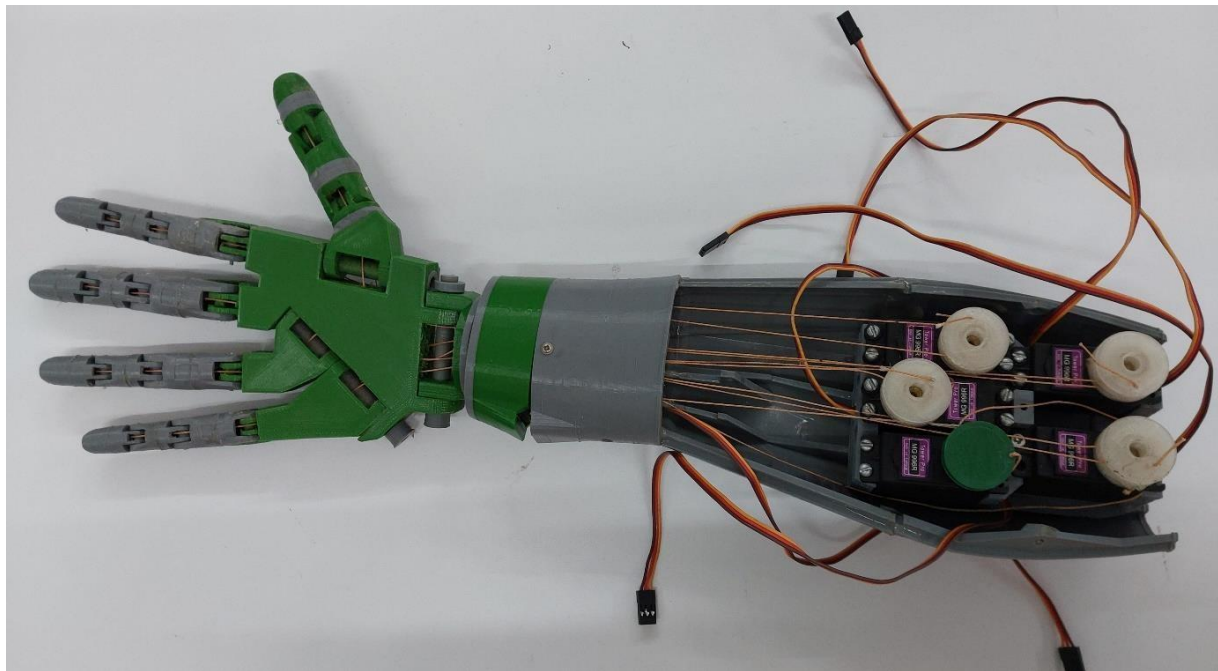
Project Title: TERRACOTTA-BASED AIR COOLER SYSTEM

Description: The Terracotta-based air cooler system is an innovative and sustainable solution for cooling indoor spaces. It utilizes the natural properties of terracotta, a porous clay material, to provide effective and energy-efficient cooling. The system consists of a terracotta body with a water reservoir, an air inlet, and an exhaust. As hot air passes through the wet terracotta, it undergoes evaporative cooling, resulting in a pleasant and refreshing indoor environment. The terracotta's porous structure facilitates the evaporation process, and the system operates without the need for harmful refrigerants or high energy consumption. With its eco-friendly design and ability to provide affordable cooling, the terracotta-based air cooler system is a sustainable alternative to traditional cooling methods.

Project Title: SUNFLOWER: A SOLAR TRACKING SYSTEM

Description: A sunflower solar tracking system is designed to optimize solar panels' efficiency by aligning them with the sun's position throughout the day. The name "sunflower" derives from how sunflowers naturally turn their heads to face the sun. The primary purpose of a solar tracking system is to maximize the amount of sunlight falling onto the solar panels. By tracking the sun's movement from east to west, the system ensures that the panels always face the most direct sunlight, which results in increased energy generation.
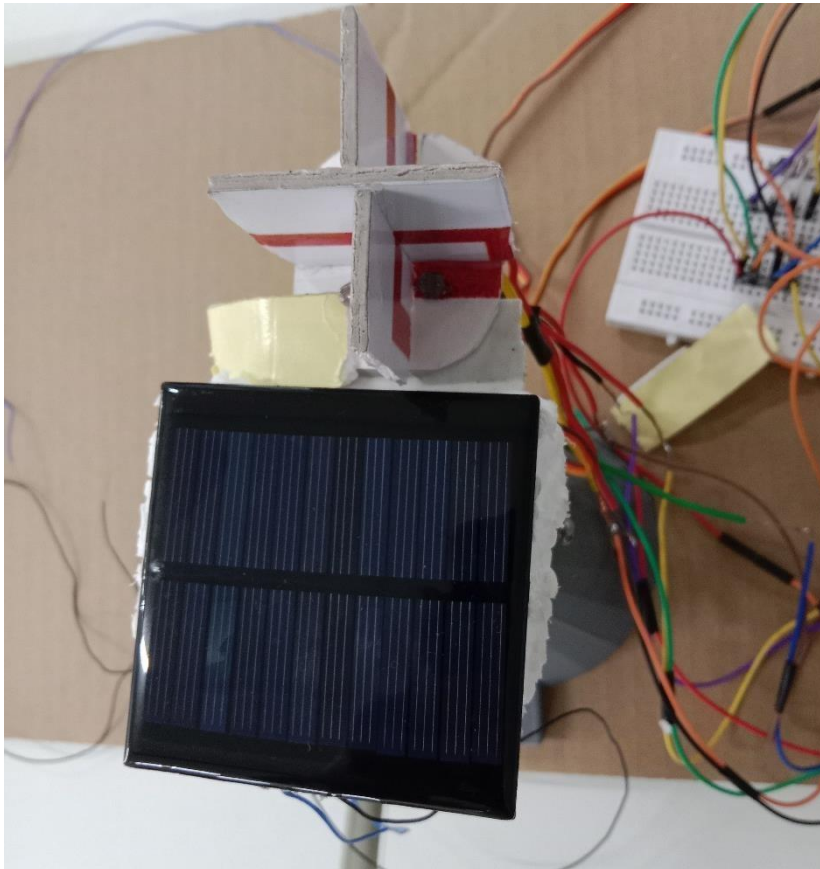
Project Title: MULTITASKING SPIDER ROBOT

Description: The Multitasking Spider Robot is an innovative and versatile robotic system designed to mimic the characteristics and movements of a spider while incorporating various sensors for enhanced environmental awareness. This product is suitable for a wide range of applications, including search and rescue operations, environmental monitoring, and industrial automation. It incorporates a comprehensive array of sensors to effectively perceive and interact with its surroundings. Various types of sensors include temperature, humidity, ultrasonic, gas, and LiDAR. The robot is equipped with onboard processing capabilities to analyze sensor data in real time. It uses advanced algorithms to interpret the sensory inputs, make decisions, and adapt its movements accordingly. The Multitasking Spider Robot has numerous applications across various domains, including search and rescue, environmental monitoring, surveillance, and security. As technology continues to advance, the Multitasking Spider Robot holds immense potential for further development and integration with emerging technologies like artificial intelligence and wireless communication.
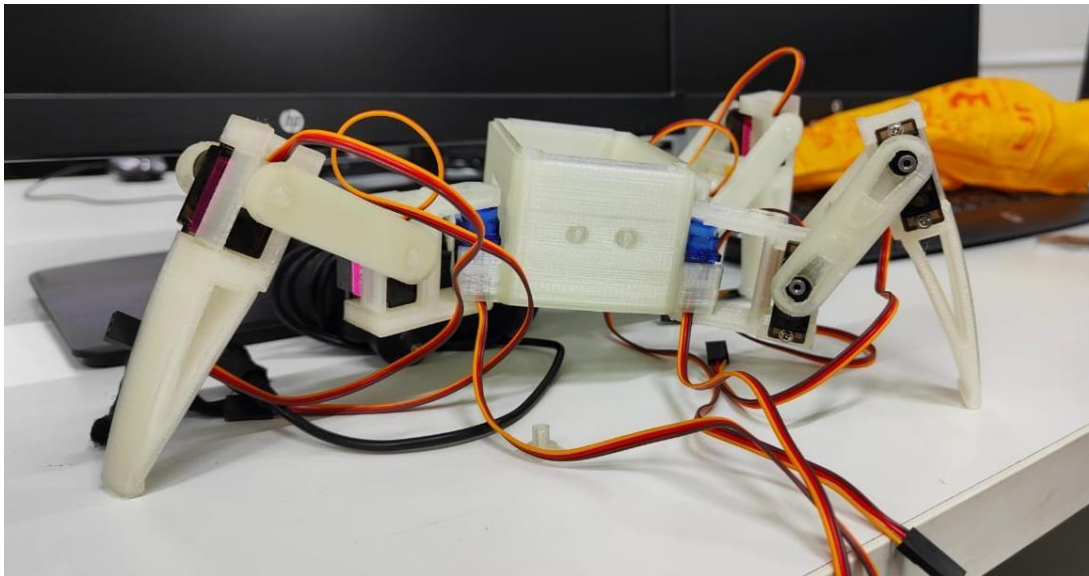
Project Title: UNMANNED AIR VEHICLE ASSEMBLY

Description: Unmanned Air Vehicle (UAV) assembly integrates electric motors, power electronics, and propellers into the aircraft structure. Electric and servo motors, driven by batteries, provide propulsion without traditional fuel. The lightweight design enhances flight efficiency, extends endurance, and reduces environmental impact. Electric UAVs offer quieter operation and simplified maintenance, making them ideal for various applications, such as surveillance, mapping, and cargo delivery. Integrating electric motors enables eco-friendly, cost-effective, and versatile UAV platforms, revolutionizing aerial missions and fostering sustainable aviation advancements.

Project Title: FACEBOOK OPEN-REDIRECTION VULNERABILITY WITH LINKSHIM HASH CAPTURING

Description: For example, the url is something like this:
https://facebook.com/l.php?u=https://example.com/
When one tries to visit the link, a redirection notice is issued by the browser which is notifying the user about the redirection. The redirection notice looks something like this. For example, the url is something like this: https://facebook.com/l.php?u=https://example.com/
When one tries to visit the link, a **redirection notice** is issued by the browser which is notifying the user about the redirection. The redirection notice looks something like this.
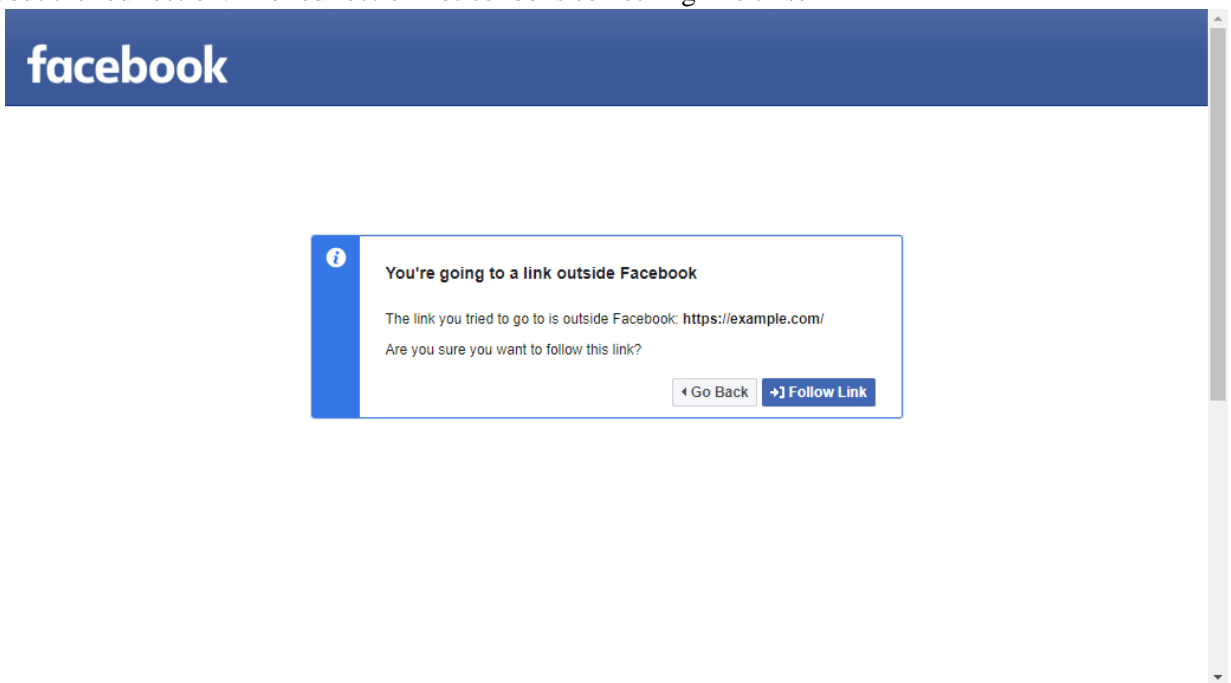
Project Title: POWERSHELL TROJAN THAT CAN EVADE WINDOWS DEFENDER

Description: A Trojan horse is any malware that misleads users of its true intent. The trojan developed by me consists of a PowerShell payload, which on execution on the victim system, triggers a reverse shell back to the attacker system's IP address, giving the attacker full access to the victim system. Trojans are a common form of malware found in today's society. However, the following trojan holds the power to evade Windows Defender (built-in windows antivirus). This attack can be used for penetration testing and further practices like privilege escalation, reconnaissance, etc. Downloading and executing the v.bat file will automatically download and execute the trojan, i.e., the rs.exe file. The trojan has been obfuscated in such a way that Windows Defender is not able to detect it and hence, allows it to run on the victim machine.

Index of /

Name	Last modified	Size	Description
rs.exe	2022-10-16 18:56	130K	
v.bat	2022-10-16 18:56	144	

Project Title: DUMM-E

Description: It is a type of articulated 6 axis robots and the most common for industrial manufacturing. They provide the flexibility, strength, and reach needed to complete most applications. Six-axis robots can move in the x, y, and z planes. In addition, they can perform roll, pitch, and yaw movements. This makes the movements of these robots like that of the human arm. Our robot will be able to perform pick and drop, Welding, Soldering, Drilling, and screwing and unscrewing; with manual command as well as voice command.

Projects for Software Domain (IIC-IEM):

Project Title: IIC Management Website

Description: A Development project for IIC to resolve the ID issues, automated email system, membership proof, and security check-in and out. In addition to this, it will provide a certificate issued by the admin users, which will be a proof of Internship Certificate for MAR Points.

Working Layout:

Firstly, we will concentrate on the users' hierarchy and privilege. The hierarchy (Top to Bottom) follows:

a) **Super-User-**
   The top heads, who will issue an offer letter to the selected candidates after the approval request from the mentor/ admin. These users will have the authority to remove any member or accept any member after the approval of admin users.
   The database lists will be provided to the super-users, including admin users, faculty mentors, student users and security user with its unique id and role.

b) **Mentor (Faculty Members)-**
   These users do not have any role basically but can see the list of admin users & student user. They can view the dashboard & specialists of particular users for future project planning. We will provide a temporary timing chatbot (notified in emails) for project acceptance/approval.

c) **Admin User-**
   These users who played the major role from interviews to project session. These users have unique features:
   - Sending aid of advice for any member approval request to the super-user.
   - Can view the mentor (Faculty Members)
   - Can also send a removal of membership request.
   - Can make project groups along with student users for particular team.
   - Can issue direct certificates to the student user, which will be notified to the super user immediately via mail.
   - Any research project send to the student user, the admin user will get the notification of the 'send project request'.

d) **Student User-**
   They are the normal users having id and dashboard with full details. They will be able to log in & log out at their time and also give attendance through the portal.
   ** Functionalities are still user maintenance.

e) **Security User-**

   **Functionalities not decided yet

Project Title: IIC RESOURCE APP (INITIAL PHASE)

Description: This app will act as a study material supplier for freshers at IIC- IEDC. Multiple courses will enable students to learn at their own pace (the technology of their choice).

Super-users/admins will have access to add the best possible materials so that everyone can access them. There will be course materials available in doc, pdf, and word format & also, there will be multiple YouTube playlist links for added benefits. Admins can also add/remove members on joining/leaving the organization.

Project Title: LiDAR– LiFi COMMUNICATION SYSTEM FOR DEVELOPMENT IN DISASTER MANAGEMENT

Description: Climate change and disaster mitigation are some of the G20 goals. In the project work, the integration of LiDAR-LiFi technology has great potential to handle disaster management concerns by providing precise data gathering, rapid communication, early warning systems, effective response, and sustainable planning. Here, the Search and rescue, damage assessment, and infrastructure planning are aided by LiDAR-created 3D maps. This project proposes a robust LiDAR-LiFi integrated communication architecture for SAR response to natural disasters using VTOL drones. Using NUCLEO-U575ZI-Q with a GIS database enhances LiDAR area mapping for aerial surveillance and remote monitoring. Here, each network server's availability function determines LiFi's viability. A fixed-wing quadcopter drone is designed for the entire surveillance. The system detects the optimal route for reaching disaster-affected individuals.
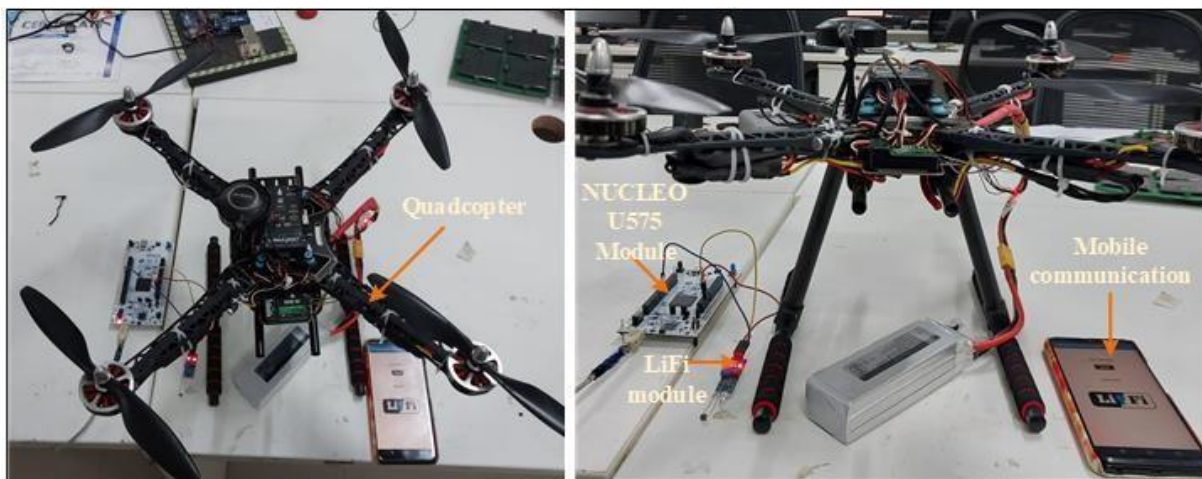
Project Title: SIGN COMPANION: A REAL-TIME SPEECH TO SIGNED LANGUAGE CONVERSION SYSTEM
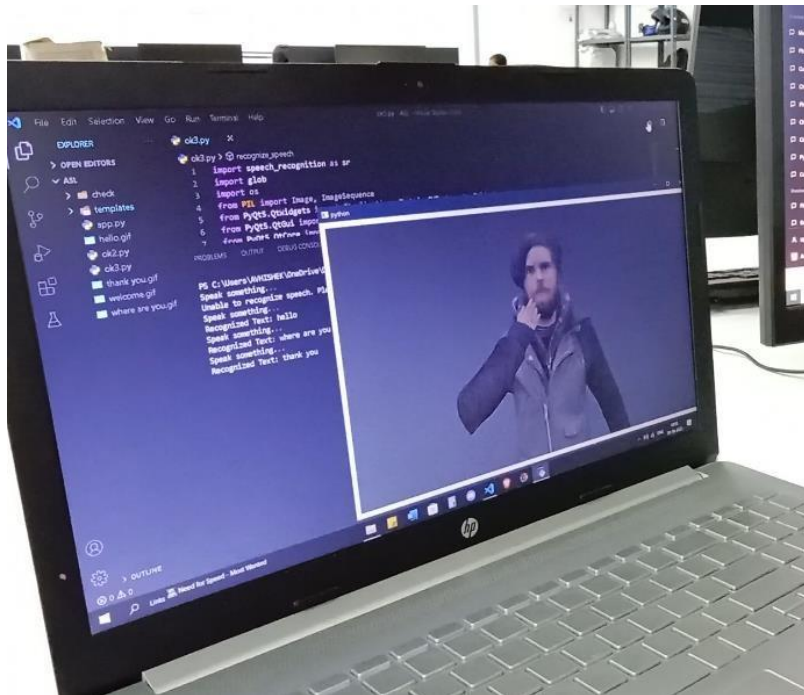
Description: The sign companion: a real-time speech-to-signed language conversion system designed for converting speech into signed language in real time. The system also provides the implementation of a website or Android application. For those who are deaf or hard of hearing, a speech-to-signed language conversion technology encourages inclusion, accessibility, and successful communication. Bridging the communication gap between spoken and signed language promotes comprehension and equitable participation in various social, academic, and professional situations.