DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

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TECHCOM

TECHNICAL MAGZINE

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CONTENTS

NARAYANA ENGINEERING COLLEGE :: GUDUR

(An Autonomous Institution Under JNTU, Ananthapuramu)

Vision of the Institute

To be one among the premier institutions of the country for professional Education in producing technocrats with Competent skills, Innovative ideas and Ethicsstrong to servethe nation.

Mission of the Institute

- To provide an environment most conducive to learning with state of the art infrastructure, well equipped Laboratories and researchfacilities to imparthigh quality technical education.
- To emphasize on innovative ideas and creative thinking and preparethem to meet the growingchallenges of the industry.
- To inculcate the leadership qualities, multi-disciplinary approach, ethics and lifelong learning in graduates to serve the diversesocietal needs of our nation.

Vision of the Department

To produce technically competent Electronics & Communication Engineers with a motiveto meet the needs of the industry and evolving society through advanced research, professional ethics and lifelong learning.

Mission of the Department

- To enrich the technical skills of the students through effective teaching-learning practices, continuous assessment methods and eminent faculty.
- To continuously enhance creative thinking, research ability and innovative skills of students through training on core and multidisciplinary technologies and skill enhancement programs.
- To inculcate leadership qualities, ethics, social responsibility and gratitude through outreach programs.

Program Educational Objectives (PEOs)

PEO-1: Attain the global and local opportunities and reach greater heights in their chosen profession by demonstrating technical expertise.

PEO-2: Gain recognition by exhibiting problem solving expertise for addressing significant problems of industry and society.

PEO-3: Become good leaderswith ethics and support, contribute and encourage diversity and inclusiveness in theirworkplace and society.

Program Specific Outcomes (PSOs)

PSO-1: Responsive to ideas: Apply the knowledge on core Electronics and Communication Engineering in orderto develop skillsto analyze, designand develop innovative solutions for the real worldproblems.

PSO-2: Domain Expertise: To develop interpersonal skills to demonstrate proficiency using the latesthardware and softwaresolutions by maintaining professional and societal responsibilities.

Program Outcomes(POs)

PO-1: Engineering knowledge: Apply the knowledgeof mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

PO-2: Problem analysis: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

PO-3: Design/development of solutions: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

PO-4: Conduct investigations of complex problems:Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide validconclusions.

PO-5: Modern tool usage: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineeringactivities with an understanding of the limitations.

PO-6: The engineer and society: Applyreasoning informed by the contextual knowledge to assess societal,health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

PO-7: Environmentand sustainability: Understand the impact of the professional engineering solutionsin societal and environmental contexts, and demonstrate the knowledge of, and needfor sustainable development.

PO-8: Ethics: Apply ethicalprinciples and committo professional ethics and responsibilities and norms of the engineering practice.

PO-9: Individual and team work: Function effectively as an individual, and as a member or leader in diverse teams, and in multi disciplinary settings.

PO-10: Communication: Communicate effectively on complex engineering activities with the engineering community and withsociety at large,such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and giveand receive clearinstructions.

PO-11: Project management and finance: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multi disciplinary environments.

PO-12: Life-longlearning: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadestcontext of technological change.

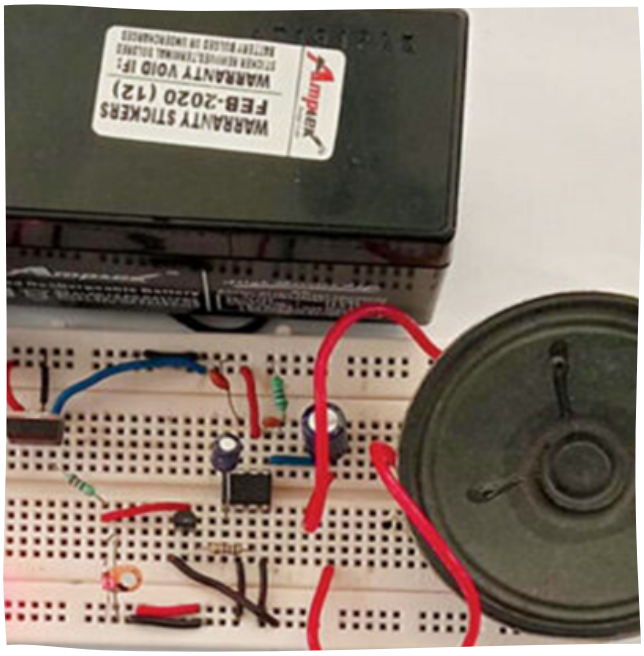
Professor Desk

The ECE Department's mission is to carry out advanced research and development in various areas of Electronics & Communication Engineering with different application domains,and to train and educate, at undergraduate levels , engineers of outstanding ability who can become innovators and new product creators.

As a discipline, ECE focuses on the design of underlying hardware systems. Our curriculum is directed to applications in major areas such as telecommunications, energy and electronics sectors, while encouraging development of necessary skills for integration of hardware and software components. We believe that many creative opportunities exist at the boundaries of traditional ECE, and have accordingly planned for cross-training of students across disciplinary boundaries.

A Simple But Versatile Musical Horn

This simple musical horn can be used in a car, scooter, cycle, or motorbike, or even as a call-bell. It uses melody generator IC UM66 that generates a musical tone, which is amplified by IC LM386.The tone of the horn cannot, however, be changed as no potentiometer has been used to keep the circuit simple. The circuit comprises a bridge rectifier (BR1), 9V voltage regulator 7809 (IC1), melody generator UM66 (IC2),low-power audio amplifier LM386 (IC3), and a few other components. Capacitors connected across the supply terminals are used to minimize any noise signals. Heart of the circuit is melody generator IC UM66. The IC has an inbuilt beat and tone generator. It has three legs like a transistor and is available in many versions that produce different melodies. The UM66 series of ICs is meant for use in call bells, cell phones, and toys. IC UM66 has a built-in ROM program for music and consumes very low power. The melody signal is generated at pin 3 of UM66 and it is amplified by LM386 to drive the loudspeaker. The circuit can generate music even without audio amplifier LM386, but the volume will be very low.Heart of the circuit is melody generator IC UM66. The IC has an inbuilt beat and tone generator. It has three legs like a transistor and is available in many versions that produce different melodies. The UM66 series of ICs is meant for use in call bells, cell phones, and toys.IC UM66 has a built-in ROM program for music and consumes very low power. The melody signal is generated at pin 3 of UM66 and it is amplified by LM386 to drive the loudspeaker. The circuit can generate music even without audio amplifier LM386, but the volume will be very low.



ALAGUNTA MEGHANA
18F11A0402

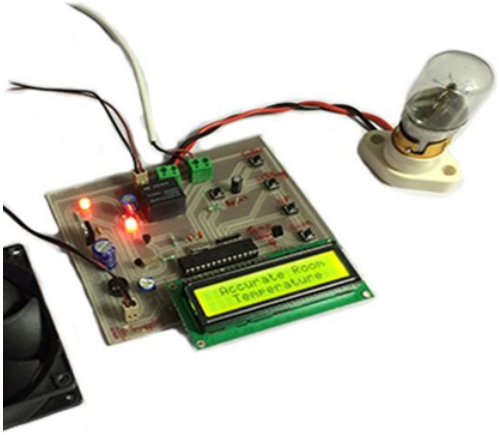
Accurate Room Temperature Controller Project

The main purpose of this Digital Temperature Controller is to control the temperature of any device like AC or any other electronic devices whose temperature keeps fluctuating and thus requires a constant watch on the device. The use of this system eliminates constant watching on the device by self controlling the temperature of the system. Our proposed project consists of digital temperature sensors for more accurate temperature control in various industries. Our system overcomes the disadvantages of thermostat/analog systems in terms of accuracy. This system can be used in any firm or organization where it is very important to maintain precise temperatures. LCD display is used to display the temperature and when the temperature exceeds the set limit, the lamp is switched off in order to control the temperature. The heater is demonstrated with the help of a lamp. After the heater is switched off, the AC is switched ON. Here AC is demonstrated with the help of small fan.

After the AC is switched ON, it remains ON until the temperature reaches below the exceed limit. Thus the system keeps on switching ON/OFF the heater or the AC for automatically controlling the temperature of the system. The system uses a digital temperature sensor in order to detect temperature and pass on the data to the microcontroller. The 8051 microcontroller processes data and sends the temperature to be displayed on LCD screen.

The display consists of 7 segment display unit to display up to 4 numbers.

It consists of 4 push buttons for setting the high and low temperatures. Pressing set button allows user to increment and decrement high and low temperatures. After that the system detects temperature and switches the load when it goes beyond set limits.

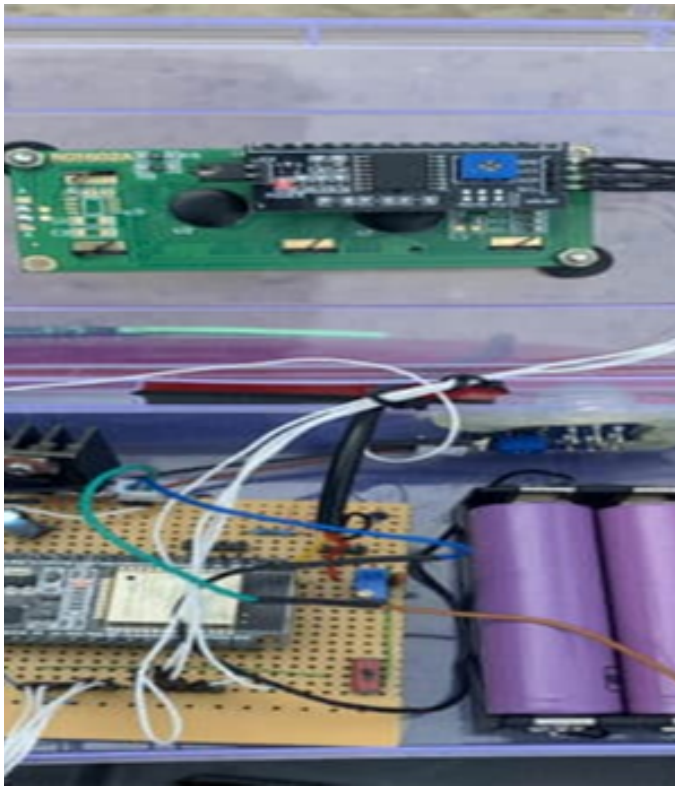


BIRUDARAJA NYMISHA
18F11A0411

Thermal Management Systems For Electric Vehicle

Nowadays electric vehicles have increased over the past decade as consumers demand more eco-friendly solutions to combat climate change. Recently Some Electric bikes caught fire due to the failure of the battery Management system, and bad battery design.Due to the Absence of a Thermal Management system Notification Alert (Battery Temperature), some people has lost their life.Unfortunately, this feature is not available in most of the existing Electric vehicles. So here the project is to Monitor the Battery Temperature & Smoke Detection to Alert the Electric Vehicle user's via Smartphone Notification, Alarm the Buzzer and also to Auto Cut off the Electric Vehicle to Avoid Further Damages.Electric Vehicle unexpected Battery Fire Accident cause loss of human life, Damaging of Electric vehicles happens when Electric Vehicle user are not alerted immediately.

When this problem is analysed and immediate alert will be sent to Electric Vehicle user's this will help in avoiding loss of human life and Electric vehicle damages. The objectives and the points that we achieved due to the developed system are shown below.Monitoring the Battery Temperature and smoke to alerting users via buzzer and smartphone notification all the time.Auto cut-off the battery power from the Electric Vehicle to avoid further damages.



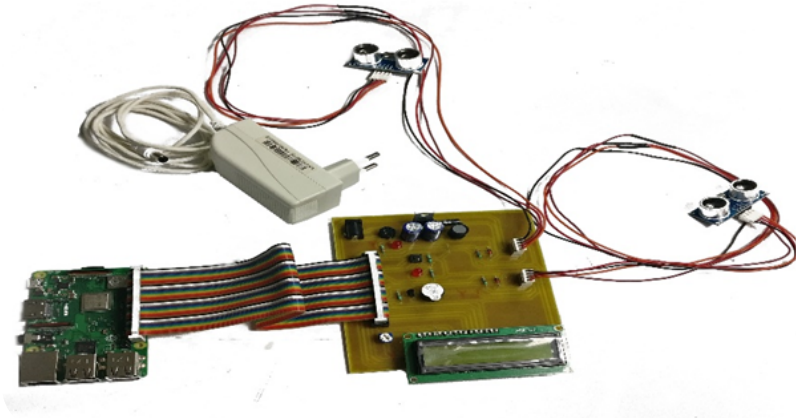
GANUGAPENTA MADHURI
18F11A0428

IOT Garbage Monitoring Using Raspberry Pi

The IOT Garbage Monitoring System is designed by ease the problems people or organisation face while managing their waste.The system allow the user to keep watch on the garbage bins by utilising buzzer and IoT service.The system has a buzzer on it which sets off an alarm on fulfillment of the garbage bin, other than this the user can also watch over the bins from anywhere using IoT service.The system is constructed using a Model B of Raspberry Pi 3, which works as the brain of the system.

It is packed with many features like, a quicker 64-bit 1.4GHz quad core chip, 1GB of RAM, quicker dual-band 802.11 b/g/n/ac wireless LAN, Bluetooth 4.2, and much quicker 300 Mbit/s ethernet. It has Improved thermals on the Pi 3 B+ means that the CPU on the BCM2837 SoC can now run at 1.4GHz. To keep watch on level of garbage in the bins, the system consists of a couple of HC-SR04 Ultrasonic Range Finder Distance Sensor Module. The Ultrasonic sensor works on the principle of SONAR and is designed to measure the distanceusing ultrasonic wave to determine the distance of an object from the sensor. The sensor helps the system to sense the level of garbage in the bins.The Raspberry Pi is equipped with WiFi connectivity, thus making it suitable to watch the system using IoT, from anywhere. As so the system works towards ease the garbage management.

The real-time garbage fill level of each bin is displayed on an LCD display. In addition to that, the data is also transmitted to a remote server by means of IOT protocols. An IOT platform like ThingSpeak is used to receive, store, and visualize this data. A graphical user interface is built using the ThingSpeak IOT platform, which visualizes the sensor data with respect to time, in the form of a graph.

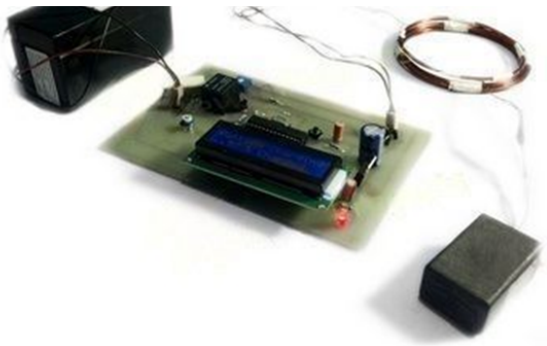


GUNDALA VENKATARAMANAIAH
18F11A0436

Smart Wireless Battery Charging With Charge Monitor Project

In This article it is a device to transfer power wirelessly instead of using conventional copper cables and current carrying wires and also measure battery charge.It also charges the battery using wireless power transfer concept till it reaches 100% capacity. The concept of wireless power transfer was introduced by Nikolas TeslaThis power is made to be transferred within a small range only for example charging rechargeable batteries etc.For demonstration purposes we have a battery that operates by using wireless power. This requires an electronic circuit for conversion of AC 230V 50Hz to AC 12V, high frequency and this is then fed to a primary coil of an air core transformer. The secondary coil of the transformer develops 12V high frequency.

The system also measures the charge in the battery and charges it until it reaches a 00% capacity. For this purpose we use an Avr family microcontroller that constantly measures battery charges and charges battery automatically until it reaches 100% capacity and stops charging the battery as soon as the charge reaches 100%. Therefore by this way the power gets transferred through primary coil to secondary coil that are separated by certain distance around 4cm. The range may be increased by increasing coil size accordingly. Here the primary coil acts as transmitter and secondary coil receives the power to run a load. This project can be used to charge batteries of a various devices and applications such as battery charged scooters and vehicles without plugging in as well as measure their charge.

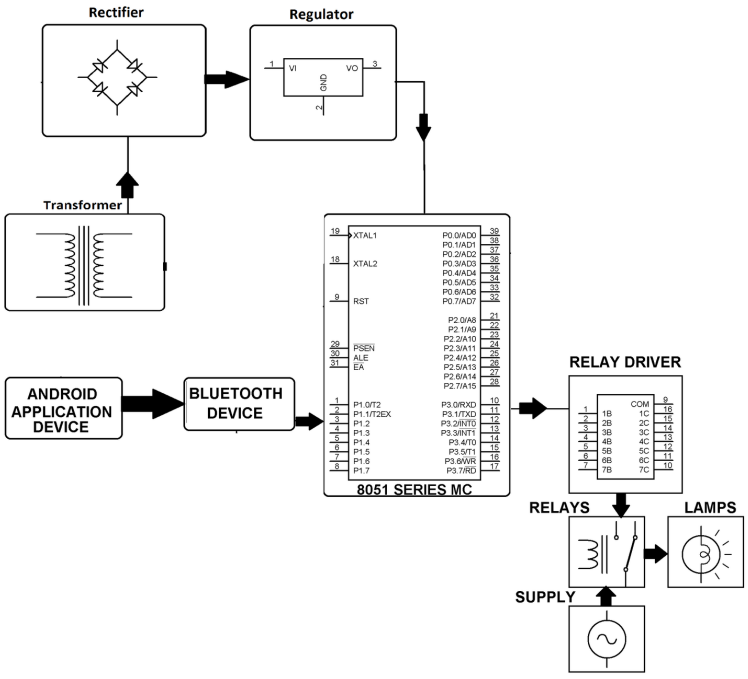


KATTHI SRILEKHA
18F11A0445

Home Automation Using Android

This article helps to control the electrical loads with the help of android application. The electrical loads are controlled based on Bluetooth input signal. This input signal is received from the android device. Many times it becomes too tiring to operate the electrical switches manually every now and then. This is a big problem especially in case of aged or handicapped people.This system solves the issue by interfacing a unit with home appliances that switches these loads based on the input received from android device.

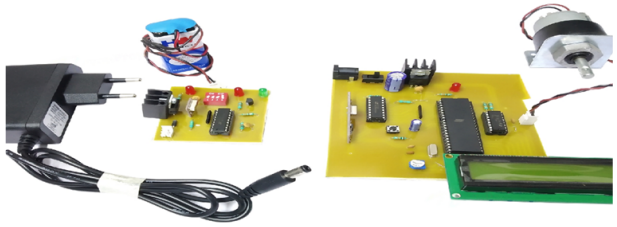
The android device may be any android based phone or tab having an android OS. The app also provides an effective GUI for providing this functionality.An 8051 microcontroller is used in this system. The Bluetooth receiver is interfaced with microcontroller in order to accept the commands and then react accordingly. It operates the loads through a set of relays using a relay driver IC. Relays are used between loads and the control unit.This system proves to be very beneficial for controlling various domestic applications and in industrial setups. The power supply setup of the system contains a step down transformer of 230/12V, used to step down the voltage to 12VAC. To convert it to DC, a bridge rectifier is used. In order to remove the ripples, a capacitive filter is used and it makes use of 7805 voltage regulator to regulate it to +5V that will be needed for microcontroller and other components operation.

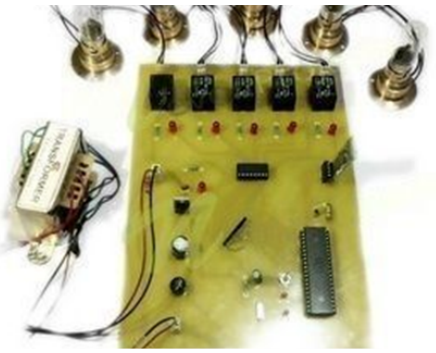


Our solar air purifier consists of a heavy duty suction fan that pulls air from the bottom of the purifier through a layer of HEPA and Carbon filters for elimination of PM 10 PM 2.5 pollutants as well as gases.

The purifier uses 2 layer purification, the first one being HEPA layer and second and active carbon filter. The combination of these 2 filters leads to dual filtration using a centrifugal air force to suck large amount of air and purify it of dust particles. Now this suction fan is used to suck out air using high power centrifugal force and blowing out fresh air from the top. The system also includes an air quality sensor and display to display the current air quality. We now use a solar panel for the power supply. The panel is used to supply electricity to battery which in turn powers the motor to run the suction fan.The machine is mounted with 4 castor wheels and a handle for easy movement. This makes the air purifier portable so it can be easily moved to school play areas, parks, residential areas,public places for efficient and instant pollution control.

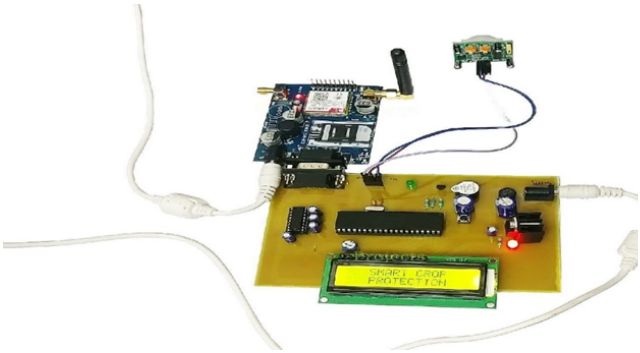
KONDURU YASWANTHI
18F11A0447





Smart Crop Protection System From Animals PIC

Crops in farms are many times ravaged by local animals like buffaloes, cows, goats, birds etc. This leads to huge losses for the farmers. It is not possible for farmers to barricade entire fields or stay on field 24 hours and guard it. So here we propose automatic crop protection system from animals. This is a microcontroller based system using PIC family microcontroller. This system uses a motion sensor to detect wild animals approaching near the field. In such a case the sensor signals the microcontroller to take action. The microcontroller now sounds an alarm to woo the animals away from the field as well as sends sms to the farmer so that he may know about the issue and come to the spot in case the animals don't turn away by the alarm. This ensures complete safety of crops from animals thus protecting the farmers loss.



NANDIMANDALAM JAYASRI
18F11A0467

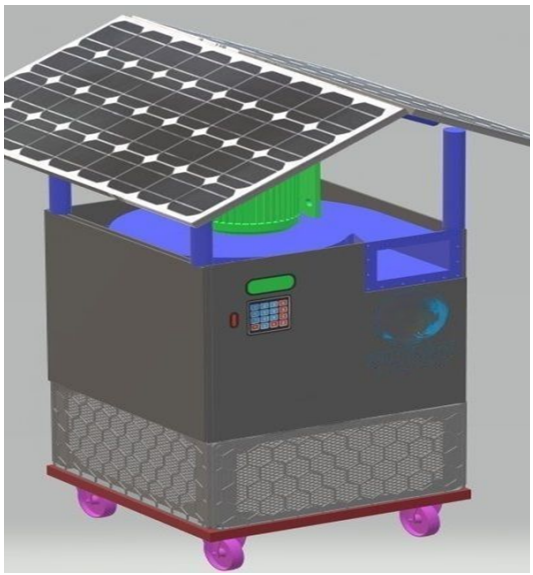
Solar Outdoor Air Purifier With Air Quality Monitor

Pollution has rocked the world with skyrocketing pollution levels. Though the long term solution to the pollution problem lies in finding and minimizing pollution sources,we need to bring the current pollution levels under control by the time.

The best way of controlling pollution is by using air purifiers. But regular indoor air purifiers are small low power devices that don't posses enough purifying capability needed for outdoor spaces. Along with this there is also an issue of power supply in outdoor machines.So here we design a heavy duty outdoor air purifier that is made for outdoor purification along and powered by solar panels so it is energy independent.

Our solar air purifier consists of a heavy duty suction fan that pulls air from the bottom of the purifier through a layer of HEPA and Carbon filters for elimination of PM 10 PM 2.5 pollutants as well as gases.

The purifier uses 2 layer purification, the first one being HEPA layer and second and active carbon filter. The combination of these 2 filters leads to dual filtration using a centrifugal air force to suck large amount of air and purify it of dust particles. Now this suction fan is used to suck out air using high power centrifugal force and blowing out fresh air from the top. The system also includes an air quality sensor and display to display the current air quality. We now use a solar panel for the power supply. The panel is used to supply electricity to battery which in turn powers the motor to run the suction fan.The machine is mounted with 4 castor wheels and a handle for easy movement. This makes the air purifier portable so it can be easily moved to school play areas, parks, residential areas,public places for efficient and instant pollution control.



PESALA AKSHITHA
18F11A0480

Crowd Detection Camera To Prevent COVID-19

The rapid spread of severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) has led to the coronavirus disease 2019 (COVID-19) worldwide pandemic. This unprecedented situation has garnered worldwide attention. An effective strategy for controlling the COVID-19 pandemic is to develop highly accurate methods for the rapid identification and isolation of SARS-CoV-2 infected patients. Many companies and institutes are therefore striving to develop effective methods for the rapid detection of SARS-CoV-2 ribonucleic acid (RNA), antibodies, antigens, and the virus. In this review, we summarize the structure of the SARS-CoV-2 virus, its genome and gene expression characteristics, and the current progression of SARS-CoV-2 RNA, antibodies, antigens, and virus detection. Further, we discuss the reasons for the observed false-negative and false-positive RNA and antibody detection results in practical clinical applications. Finally, we provide a review of the biosensors which hold promising potential for point-of-care detection of COVID-19 patients. This review thereby provides general guidelines for both scientists in the biosensing research community and for those in the biosensor industry to develop a highly sensitive and accurate point-of-care COVID-19 detection system, which would be of enormous benefit for controlling the current COVID-19 pandemic.

Coronavirus has shaken the whole world after being first observed in China. Its symptoms comprise shortness of breath, fever, chills, loss of taste and smell, body aches, and cough. Coronavirus is primarily spread by physical contact. Its first case was discovered in Wuhan, China, in December 2019.

VENUMBAKA
PHANEENDRANATH
18F11A04B3

BRAIN TWISTER

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