Green Campus Initiatives

"Going green" means to pursue knowledge and practices that can lead to more environmental friendly and ecologically responsible decisions and lifestyles, which can help to protect the environment and sustain its natural resources for current and future generations. **Going green** saves us from toxic products and environmental pollution. This helps us to live a healthier lifestyle which eventually increases our productivity both at the workplace and at home.

Green Campus is something that merely means a "campus with low environmental impact". It is all about sweeping away wasteful inefficiencies and using conventional sources of energies for its daily power needs, correct disposal handling, purchase of environment friendly supplies and effective recycling program.

Initiatives taken in the Department

- Students are motivated to

    1. Take part in paper presentation on green practices.
    2. Select the projects on waste management.

- Department is adhered to the following

    1. Send documents and invitations electronically.
    2. Edit, spell, and grammar check on screen.
    3. Design document/shrink images to minimize paper consumption (e.g. set default margins to .75" on all sides (or less!).
    4. Think before printing, "is it really necessary?"
    5. Always print double - sided.
    6. Save one - sided leftovers for scrap, or to print drafts on.
    7. Turn off monitors when away from the computer.
    8. Always turn off lights and fans when not in use.
    9. Turn off unnecessary lights and use daylight instead.
    10. Take the stairs instead of an elevator.
    11. Usage of dust bins in classrooms and laboratories to keep department clean.

Bapuji Educational Association (Regd.)
BAPUJI INSTITUTE OF ENGINEERING & TECHNOLOGY, DAVANGERE-577004
Department of Electronics and communication Engineering

Papers Presented by Students

SOLAR TREE CONCEPT

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Now a day's oil supply is decreasing therefore energy sources are becoming limited throughout the world. The technology of using Bio fuel is an alternate solution of energy sources, but if we think that all the world's vehicles will be powercd by bio fuels then the amount of land used for farming must be doubled. Abundant power is produced by Nuclear energy, but many fears from the emission of catastrophes from such sources. In all these Solar Tree proves to be most beneficial source of energy. The installation of large solar collectors requires a very big space which is the main problem associated with tapping solar energy .This problem can be avoided by installing a Solar Tree requiring less space instead of a number of solar panels. This paper presents Solar Tree implementation as alternate source of energy in urban cities. A new idea of a solar tree design using nano wire solar cell is presented. Nano wires possess high physical light absorption properties which can be improved tremendously Hence we can say that it is a revolutionary urban lighting concept and these technologies lead to the development of high   efficiency   solar   energy.

IoT Based Vehicle Emission Monitoring System

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The main source of atmospheric taint happens due to automobiles. Using empirical scrutiny, ritual mechanized air monitoring system has high rigor, but unecononmical and single datum class ake it unfeasible for large-scale furnishing. In order to eject the issues in ritual systems we have introduced Internet of Things (IoT) into the field of environmental barrier. This paper is to introduce vehicle emission monitoring system using Internet of Things (IoT) which is a green thumb for tracking down vehicle causing taint on the city roads and measures multifarious genres of toxic wastes, and its level in air. This paper puts forward a kind of real-time air pollution monitoring system at any time anywhere using CO, Hydrogen gas sensor. The measured data is shared to vehicle proprietor via text message, and agencies of national environment in addition a buzzer is used for drivers notice.This assay shows that the system runs abiding, an economical and can be controlled tractably, it can smell out the vehicle exhaust in real-time, and can improve the detecting level and accuracy of the exhaust monitoring system. This system provides good outcomes in monitoring the air pollution exclusively in the urban areas.

SOLAR TRAIN
Power on Wheels

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For the huge amount of power needs to run the trains, it can also be made possible with the solar energy rather than using the existing diesel. The time has arrived where there is a lot of scarcity of the fuel and in 5 to 10 more decades there would be no fuel available. So one of the most fuels being consumed in public transport system includes trains and thus mastering it the idea of making the trains to be equipped with the solar would perfectly help to reduce the scarcity of the fuel and even the use of non-exhaustible and eco-friendly energy.

DISEASE DETECTION IN PADDY USING
IMAGE PROCESSING

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India is predominantly an agrarian economy with more than 75 percent of its population living in villages and depending on agriculture and allied activities for their livelihood. Land has traditionally been the basic income-yielding assets of Indian farmers. Whilst most farmers are familiar with conventional farming practices, they are often ill positioned to promptly deal with diseases and plant infestations affecting their crops. Current advisory systems tend to be generic and are not tailored to specific plots or farms. Our paper comprises an agriculture advisory model to provide a prototype of paddy disease detection system. The image of diseased/infected paddy crop is also captured using the device. Ideally, the images would be processed in such a way as to provide a visual representation of the affected crops that reflects the true nature of the scene. A digital image is further analyzed by taking diseased feature of that image and then classified. That classified inmformation can be used for precision farming by farmer for decision support system.

Projects carried out by Students

ROBOT FOR DRY AND WET CLEANING

The advancements made in technology for robotics have made life of mankind very much easier and comfortable. This technology describes a smart floor cleaning robot that allows cleaning the floor by giving instructions to the robot. This robot makes floor cleaning process easy and fast utilizing a wireless robotic cleaning system. This wireless system consists of transmitter application that runs on android app which allows the robot to follow commands given by the user through transmitter app. The proposed robot consists of Arduino Mega controller which has 54 digital I/O pins, roller brushes. The Arduino Mega, on receiving the commands from android device through Bluetooth receiver, decodes the given commands and controls the motor to achieve the floor desired path and direction.

INTEGRATED SYSTEMS FOR FOREST FIRE EARLY DETECTION & MANAGEMENT

Natural disasters have always been mankind's constant companion since time immemorial. Forest fire is one such disaster which when occurs at large scale not only destroys the flora, fauna,vegetation of the forest but also puts the life of human being and animals at a very high risk and creates environmental pollution. Forest fires are a universal problem that both confronts and confounds many countries. When ever a fire occurs, this system automatically senses and alerts the user by sending an alert to an app installed on web page accessible through internet. Apart from the above, an alarm circuit has been made just to facilitate the fire security team to locate the vulnerable part as soon as possible.This fire alarm circuit will give alarm only when the levels of the temperature will cross the pre-set value. The system uses a telecommunication network to link several components for cooperative detection.The perception system is based on a network of sensorial stations and central stations.The sensorial stations collect data including infared and visual images and meteorlogical information.The central stations exchange data to perform distributed analysis.

LEAF DISEASE IDENTIFICATION AND REMEDY RECOMMENDATION

Agriculture is one field which has a high impact on life and economic status of human beings. Improper management leads to loss in agricultural products. Farmers lack the knowledge of disease and hence they produce less production. Kisan call centers are available but do not offer service 24*7 and some times communication too fail. Farmers are unable to explain disease properly on call need to analyse the image of affected area of disease.Though, images and videos of crops provide better view and agro scientists can provide a better solution to resolve the issues related to healthy crop. Due to the improvement and development in technology where devices are smart enough to recognize and detect plant diseases. Recognizing illness can prompt faster treatment in order to lessen the negative impacts on harvest. In this project we are going to propose the system which can identify the disease in various types of leaf with the help of MATLAB and Artificial Neural Network. It informs the farmers about affected leaf and suggests a remedy for the infected leaf.

SWATCH ABHIYAN DOOR TO DOOR PICK UP OF HOUSEHOLD HAZARDOUS WASTE

The world today faces a major garbage crisis- the product of rapid economic growth, overcrowding, poor urban planning, corrosive corruption, and political dysfunction. The present tried and tested methods of garbage collection have so far been proven ineffective. And the world today is looking at smarter ways of overcoming the garbage collection problem. As municipal solid waste workers expose to too many work-related health hazards and safety risks, notably allergic and other diseases of the respiratory system. Hence to overcome this major problem of waste collection the Autonomous Garbage Collection robot is developed.

AUTOMATED SOLAR ENERGY TRACKING AND SOLAR PANEL CLEANING SYSTEM
KSCST sponsored project: 43S_BE_1439

Solar energy is very important means of expanding renewable energy resources. Due to revolution of the earth,solar source i.e. sun does not face the panel continuously hence less electricity is produced. The energy panel should face the SUN till it is present in a day. The problem above can be solved by our system by automatic tracking the solar energy. A Solar Tracker is basically a device onto which solar panels are fitted which tracks the motion of the sun across the sky ensuring that the maximum amount of sunlight strikes the panels through out the day. It is completely automatic and keeps the panel in front of sun until that is visible. The cleaning of solar panel has been designed which cleans the solar panel by using wiper and by Arduino programming, to remove the dust on the PV modules and to improve the power efficiency.

AUTOMATIC SOLAR GRASS CUTTER

KSCST sponsored project

In the time where technology is merging with environmental awareness, consumers are looking for ways to contribute to the relief of their own carbon footprints. Pollution is man made and can be seen in our own daily lives, more specifically in our own homes. Solar powered automatic lawn mower will relieve the consumer from mowing their own lawns and will reduce the environmental and noise pollution. The past technology of grass cutting is manually operated by the use of hand devices like scissor, these results into more human effort and more time required accomplishing the work. Also in old methods lack of uniformity of the remaining grass. Also due to the use of engine powered machines increases the air and noise pollution also this grass cutter require maintenance. A Solar Grass Cutter is a machine that uses a revolving blade or blades to cut a lawn at an even height.

PREVENTION OF ILLEGAL CUTTING OF TREES USING WIRELESS SENSOR NETWORKS

Forest conservation is significant issue now-a-days on account of criminal behavior of people as forests incorporate the entirely important trees. But identifying these illegal activities is difficult in huge forests. Thus, this project proposes an idea to this problem, using microcontroller and sensors. It provides effective solution to the problem of illegal cutting of trees detection and for fast reaction when logging occurs and permanent monitoring of critical areas of forest. This is the medium to detect illegal logging and smuggling of trees. Continuous monitoring of the data obtained from sensors will help to know about where the illegality is happening in the forest. Using the LCD display exact position can be found about illegal activity. The sensors like vibration and fire will provide the information on the natural disasters in the forest.

SMART AGRI CROP PLANNER

Today India, ranks second worldwide in farm output. In India, 60-70 percent of rural population depended on agriculture and it contributes 14 percent of GDP (Gross Domestic Product) to Indian economy. In Indian scenario of agriculture, the farmers are dealing with the problems of delayed monsoon, suitable crop for particular NPK (Nitrogen. Phosphorous and Potassium) of soil values as per the season and soil type i... irrigated or unirrigated. In this work, we propose an intelligent crop planning system based on parameters like Nitrogen. Phosphorous, Potassium and type of soil. This system will assist the farmers on the type of crop selection for particular soil and season like Rabi or Kharif suitable for that crop.

DRAINAGE BLOCKAGE DETECTION AND CLEARING USING IMAGE PROCESSING AND EMBEDDED MATLAB

This project aims at detection of the blocked drainage, methods that have been developed and proposes a cost effective solution to identify blockages in the drainage and provide timely alerts to authorities to clear the blockages and automatically clearing the blocked places. Ultrasonic sensors are used to identify blockage in drainage and also to measure their depth and height respectively. The proposed system captures the geographical location coordinates of drainage and blocked place using GSM module. The sensed-data includes sewage blocked depth, height of blockage and geographic location, which is stored in the database. This serves as a valuable source of information to the Government authorities.

IoT BASED AIR AND SOUND POLLUTON MONITORING SYSTEM WITH DENSITY BASED TRAFFIC CONTROL

The main objective of this project is an effective implementation for Internet of Things is used for monitoring atmospheric conditions of environment like air pollution and sound pollution. This project presents a conceptual architecture for a versatile, flexible and cost efficient for monitoring the air and sound quality of a particular site. In the description about this integrated network architecture and the connected mechanisms for reliable and accurate measurement of parameters by sensors and transfer of information or data is done with the help of internet. This system is able to provide a mechanism for the operations of the devices to do better in monitoring stage. This monitored data can be obtained from remote location without actually visiting it due to the access of internet. The framework of this monitoring system is based on combination or collaboration of affective distributed sensing units and information system for data composition. The role of loT is the new concept used in air and sound pollution measurement, which allows data access from remote locations.

The aim of Density based traffic controller is to reduce the problem of traffic congestion which is becoming a very severe problem now-a-days. As we all know that the present traffic light system consists of a predefined hardware which has a fixed time for green light and red light. To optimize this problem we have made a framework for an intelligent traffic control system. Generally we have seen that the conventional traffic light system is not depends upon the density of the traffic. So we proposed a scheme in which the time period of green light and red light is assigned on the basis of the density of the traffic present at that time. This can be done by using IR sensors. Once the density is calculated, the glowing time of green light is assigned by the help of the Arduino. The sensors which are present on either sides of the road will detect the presence of the vehicles and sends the information to the Arduino. On the basis of those informations, Arduino will make a decision and then assign the glowing time of green light and red light. It means that the timing of the traffic lights is set according to the density of the vehicles. This is

going to be very helpful in the reduction of the traffic congestion and it has a scope for further expansion in future

MINING SAFETY- DETECTION OF TOXIC GASES USING ZIGBEE CONTROLLED ROBOTIC ELECTRONIC NOSE

Mining means extraction of valuable minerals or other geographical materials from the catch. An odor is composed of molecules, cash of which has a specific size and shape Each of these molecules has a correspondingly sized and shaped receptor in the human nose. When a specific receptor receives a molecule, it sends a signal to the brain and the brain identifies the smell associated with that particular molecule. Electronic noses based on the biological model work in a similar manner, albeit substituting sensors for the receptors, and transmitting the signal to a control Circuit rather than to the brain. This project uses three sensors like smoke sensor, Methane sensor, vibration sensor. These sensors with audible buzzer is provided for alert signal When a robot is moving on a surface, then system produces a beep sound when it detects dangerous gases. Implementation of GSM modem technology is a function to improve the security system by sending alert message to user as they are away from that compound area.

PREVENTION OF THEFT OF VALUABLE TREES USING GSM TECHNOLOGY

The main objective of our project is to detect and alert near by people regarding the theft of valuable trees and forest fire.A Smart automated unit has been thus devised to taclkle these issues.The combination of latest wireless communication systems and embedded solutions offer us such modules.The module is intended to operate in a particular area and this module consists of sensors like ADXL and fire,8051 microcontroller, GSM and GPS module and batttery.The abundance of solar energy in the forest area can be harnessed by having a small solar panel and boost the circuitary which can charge the battery.The presence of above said parts will send the present condition of th tree to the base station,using GSM and GPS module.The GSM sends message to the concerned members giving the information regarding location using GPS.The microcontroller will analyze to check whether the tree is safe or being puledaway.However the controller should continuosly monitor and update about the present condition of trees and emergency situations need to be attended by the forest authorities.For example,if the tree is fallen the ADXL value will be changed which is sensed by the controller and sends the message regarding the same.

Seminars Presented by Students

SMART NOTE TAKER

The Smart Note Taker is such a helpful product that satisfies the needs of the people in today's technologic and fast life. This product can be used in many ways. The Smart Note Taker provides taking fast and easy notes to people who are busy one's self with something. With the help of Smart Note Taker, people will be able to write notes on the air, while being busy with their work. The written note will be stored on the memory chip of the pen, and will be able to read in digital medium after the job has done. This will save time and facilitate life. There will be an additional feature of the product which will monitor the notes, which were taken before, on the application program used in the computer. This application program can be a word document or an image file.

SOLAR POWER SATELLITE

In outer space there is an uninterrupted availability of huge amount of solarenergy in the form of light and heat. So the use of satellites primarily aimed atcollecting the solar energy and beam it back to the earth is being considered. Ingeosynchronous orbit, i.e. 36,000 km (22,369 miles), a Solar Power Satellite (SPS)would be able to face the sun over 99% of the time.Research has been carried out to look into thepossibility of building a power station in space to transmit electricity to Earth by way ofradio waves-the Solar Power Satellites. Solar PowerSatellites(SPS) converts solar energy in to micro waves and sends that microwaves in to a beam to a receiving antenna on the Earth for conversion to ordinary electricity. SPS is a clean, large-scale, stable electric power source.

MOBILE VOTING SYSTEM USING IRIS RECOGNITION AND CRYPTOGRAPHY TECHNIQUES

With the advancement of electronics and computer science, mobile communication technology leads us to a fast moving entirely different world. In this scenario, we have lot of responsibilities, one of it is voting for our country. The importance of voting is lost amongst the hustle and bustle of city life. While there are some who genuinely cast their vote, but their vote might not be useful to our nation, because of the fake voles and cheating process which tends to happen during the election. This problem can be rectified by using "Mobile Voting System". It will reduce the major issues in voting process which are security, standing in a queue and time. The mobile voting system uses the coefficient Techniques, iris recognition and cryptography for the secured voting process. The iris recognition and cryptography techniques can help in avoiding the fake votes and cheating process. The election commission spends a lot of money for cash clection which will be minimized if we use this system. This system enables the voter to cast their vote to the nation from their place itself.

DIGITAL SIGNATURE

There are different types of encryption techniques are being used to ensure the privacy of data transmitted over internet. Digital Signature is a mathematical scheme which ensures the privacy of conversation, integrity of data, authenticity of digital message/sender and nonrepudiation of sender.Digital Signature is embedded in some hardware device or also exits as a file on a storage device. Digital Signature are signed by third party some certifying authority. This report describe the different key factor of digital signature with the working of digital signature, through various methods and procedures involved in signing the data or message by using digital signature. It introduces algorithms used in digital signatures.

CARBON BREATHING BATTERIES

Balancing the increasing world energy demand with the need to economically reduce carbon dioxide emissions is one of the most defining challenges of our time . Most world energyforecasts show that fossil fuels will continue to play a major role in meeting worldwideenergy demands for the foreseeable future, particularly in the transportation and powergeneration sectors. To capitalize on the exceptional, high energy density of fossil fuels, theincorporation of carbon capture, utilization, and sequestration (CCUS) technologies isessential to reduce global CO_2 emissions. Large-scale adoption of classical CCUStechnologies (for example, absorption, adsorption, and membrane separation) is currentlylimited by the additional energy requirements associated with CO_2 capture, resulting inhigher cost of energy and difficulties in transporting and sequestering the captured CO_2 .Recently, CO_2 capture has been demonstrated for mobile sources, capitalizing on the wasteenergy of combustion engines. Conversion of CO_2 to useful chemicals and fuels isunderstood to be a requirement for the commercial success of any CCUS process.

AQUILA (THE SOLAR POWERED DRONE)

Today out of 7.7 billion people only 3.9 billion are accessing Internet around the world. In order to survive, they cannot think that there is no Internet because it is inevitable part of their life, where everyone and everything is connected to the Internet. To achieve this goal, Communication is one of the main objectives. Internet is growing day by day, and at the same time the Facebook took an initiative called Aquila as the solar powered drones. This focuses on the mechanism that drone is to provide the amount of Internet services available. The project is managed by Facebook and Internet.org as Aquila (The Solar Powered Drone). The idea is to provide internet service to areas of the world where people have less or no access to the Internet. This method of online services through an extensive drone, which has a wingspan of a Boeing 737 wing with less weight than a car. This will operate at the height of 60,000 to 90,000 ft. in the air, and can run for three months with the Internet speeds of 10 gigabits per second.

ENERGY HARVESTING IN IoT DEVICES

The IoT devices are powered by the batteries. A major limitation of devices powered by battery is finite battery capacity because when loT devices communicate with each other, large amount of energy is consumed due to which devices operate for limited duration only, as long as battery lasts. One of the solutions of this problem is to use replaceable batteries. This solution of replacing battery may be effective for small loT system but for large loT systems, this solution is not effective because of the cost of maintaining and replacing billions of batteries are very high. A promising solution to this problem is energy harvesting. Energy harvesting is the process of taking energy from one or more environmental (solar, wind, radio frequency, ctc.) or other energy sources, accumulating them and converting them into usable electrical energy. This harvested electrical energy powers the IoT devices and increase the lifetime of the loT system.

ELECTRONIC PAPER TECHNOLOGY

Electronic paper (E-paper) is a portable Reusable storage and display medium that looks like paper but can be repeatedly written on (refreshed) by electronic means, thousands or millions of times E-paper will be used for applications such as e-books, electronic newspaper, portable signs, and foldable rollable displays. Information to be displayed is downloaded through a connection to a computer or a cell phone. Or created with mechanical tools such as an electronic pencil. The electronic paper display is reflective and can be easily read in bright sunlight or dimly lit environments while being able to be seen at virtually any angle just like paper. Its black and white ink-on-paper look gives an appearance similar to that of the most widely read material on the planet newspaper.The unique technology results in a compact and lightweight from factor allowing it to be ideal for highly portable applications. This seminar aims to throw light on the different technological approaches working towards the complete realization of E-paper concept.