RAJIVGANDHI UNIVERSITY OF KNOWLEDGE TECHNOLOGIES

(Established under Act 18 of 2008)

Basar, Nirmal, Telangana State –504107

A REPORT BY THE DEPARTEMENT OF ELECTRICAL ENGINEERING

as a part of   ANTAHPRAGNYA – 2020

Head of the Department:

Mr. N. Rakesh

Faculty coordinators: **Student coordinators:**

Mr. B. Bhavsingh   Mr. K. Santhosh

Mr. V. Vinaykumar   Ms. Y. Sindhuja

HOD's MESSAGE

As per the culture of Rajiv Gandhi University of knowledge technology, Basar, every academic year Department of Electrical Engineering organizes a technical fest with a very high competitive spirit to participant and with the strong determination to include their achievements & accomplishments to their resumes.

This fest is organized every year with the objective to provide platform for the students to showcase their talent with a competitive spirit. The event was successful enough to attract officials and the jury. Students are actively participated in all the events and presented their work. The fest executed with a total of 10 events planned and organized at its best of quality. Focusing on the types of events to include in the fest was decided by fest coordinators keeping the interest and need of the engineering student into consideration, with little emphasis on the fun full events behind the scene.

The events like paper presentation, poster presentation, project expo, workshop, Guest talks by officials and many more events were equally planned, executed and have managed to gather maximum response. A total of nearly 20 innovative projects, and around 10 paper and poster presentations were exhibited during the 3 day techfest.

Apart from these many fun events like Escape room, E-Wizard, Electro spot, etc. has been organized. The winners were encouraged with awards and rewards for all the events. Department feels proud to organize such a successful event and would like to convey thanks to faculty coordinators and student coordinators for their timely advice and cooperation for organizing successful Fest.

Not to forget Lab staff, Organizers, Volunteers and all the people who contributed including the students, deserve thanks for their complete effort and participation for making departmental techfest as a part of "ANTAHPRAGNYA 2020" a grand success.

Mr. N. Rakesh
HoD/EE

List of faculty:

S.no	Names of the faculty
1.	Mr. Laxman Muthyam
2.	Mr. N. Rakesh
3.	Mr. B. Bhavsingh
4.	Mr. V. Vinay Kumar
5.	Mrs. U. Malavya
6.	Ms. D. Sushma
7.	Mrs. Jyothi
8.	Mr. A. Saikrishna
9.	Mr. V. Krupakar

List of lab staff:

S.no	Names of the Lab Staff
1.	Mr.S. Tulasi Ram
2.	Mr. K. Ravi Kumar
3.	Ms. K. Swetha
4.	Mr. O. Praveen
5.	Ms. K. Mounika
6.	Mr.R. Sravan Kumar
7.	Mr.Rajashekar
8.	Mr.D. Rahul

List of organizers

S.no	Name of the organizer	Designation
1.	J.Yashwanth kumar	Documentation
2.	B.Nagamadhavi	Documentation
3.	T.Harinath	Finance
4.	B.Hema Satish Kumar	Procurement
5.	M.Praveen	Procurement
6.	T.Sai sri	Content writing
7.	B. Saikrupa	Content writing
8.	P.Harish	Designing
9.	J.Manasa	Publicity
10.	G.Pavan kumar	Publicity
11.	S.Kireeti	Event organiser
12.	B.Ranadeep	Event organizer
13.	K.Vikas	Event organizer
14.	N.Abhinav	Event organizer

List of volunteers

S.no	Name of the Volunteer
1.	M.Sandeep
2.	B.Pavan
3.	Praveen
4.	Ch.Deepika
5.	Manasa
6.	Venkatalakshmi
7.	R.Rachana
8.	P.Nitya Sri
9.	V.Mohan rao
10.	Pallavi
11.	T.Bhargavi

LIST OF TECHNICAL EVENTS:

1. DEVICE DEBUGGING:
It is the concept of circuit building based on specified inputs and outputs.

2. WITRICITY:
It is the concept of wireless power transfer between two coils using principle of induction.

3. PAPER AND POSTER PRESENTATIONS:
It provides an extra vagant platform to showcase and share your technical expertise and master your discipline.

4. WORKSHOP:

An interactive environment for numerical computation, visualization and programming.

5. WORKING MODELS:
A representation of an idea, object or even a system that is used to describe the phenomena. Category:
EV, Renewable energy, Solar.

6. GUEST TALKS:

An overview of technical related concepts by guest lecturers.

7. TECHNICAL QUIZ:

Conducting quiz based on the technical topics related to EE which mainly focuses on students approach about the problems within the time limit.

8. TECHIE's ESCAPE ROOM:

It is a event where a person would try to escape from a room by performing some technical tasks.

LIST OF NON TECHNICAL EVENTS:

1. EYE FEST

2. PIC AND CLICK

ON DAY EVENTS:

S.NO	NAME OF THE EVENT	DAY 1	DAY 2	DAY 3
1.	Working models	10:00 AM-4:00 PM	10:00 AM-4:00 PM	10:00 AM-4:00 PM
2.	Paper Presentation	2:00 PM-4:00 PM	2:00 PM-4:00 PM	-
3.	Poster Presentation	10:00 AM-12:00 PM	10:00 AM-12:00 PM	-
4.	Witricity	4:00 PM-5:30 PM	-	-
5.	Device Debugging	-	4:00 PM-5:30 PM	-
6.	Escape Room	9:30 AM-6:00 PM	9:30 AM-6:00 PM	9:30 AM-6:00 PM
7.	Solar Home	11:00 AM-5:00 PM	11:00 AM-5:00 PM	11:00 AM-5:00 PM
8.	Electro Spot	-	-	-
9.	E-Wizard	-	2:00 PM-4:00 PM	-
10.	Electro Jam	2:00 PM-4:00 PM	-	-
11.	Circuitrix	-	-	2:00 PM-4:00 PM
12.	E-Jigsaw	3:00 PM-4:00 PM	-	-
13.	Fetch-em	-	3:00 PM-4:00 PM	-

GUEST TALKS:

S.No.	Details of the Speaker	Topic of Guest Talk	Time /Venue
1.	**Dr. Naveen Kumar Marati,** Senior Hardware Engineer-Power Electronics at Valeo Chennai.	**Current and Future Aspects of Electrification in Automotive & IEEE student branch requirements and its benefits** **(Target Group: All the Departments)** **Deliverables:** • **IoT in Automotive** • **Current status, future scope and advancements in Electric vehicles.** • **IEEE Students branch requirements and its benefits** • **Initiation to start IEEE students chapter in our campus** • **Internship opportunities**	25-01-2020 (2:00 PM - 6:00 PM) ABI Auditorium
2.	**Mr. Bhasker Gurram,** Manager (Design), Aircraft Upgrade Research and Design Centre (AURDC), Hindustan Aeronautics Limited (HAL), Nasik, Maharstra	**Career guidance in Aerospace: Flight Control systems various electrical & software integration techniques of missile & bombs fighter aircraft** **(Target Group: EEE, ECE & CSE)** **Deliverables:** • **Career opportunities in Aerospace** • **Current technology usage in Aerospace** • **Internship opportunities**	30-01-2020 (3:00 PM - 5:00 PM) ABI Auditorium

1. E-bicycle

Objective:

The bicycle has gone from being an old fashioned recreational product to a less polluting means of transport and a compact, ultra light personal mobility tool. This is how electrical bicycles will be used as the pillar that could support individual public transport in large cities worldwide. The objective of this manuscript is to detect how worldwide research on the electric bicycle is being developed, and, especially, around which scientific domains is it clustered, to finally identify the main trends in the field. This study has been carried out based on the scopus database, where all the publications related to the topic of the electric bicycle have been analyzed up to the year 2017. Therefore, research on the global research trends of this topic was conducted. Its evolution over time shows that since 2008 the growth of publications is much higher than in the previous period. The main countries are china and the USA, and it can be inferred that there are two major trend countries with high environmental awareness, which also have a large population and that the electric bicycle is a suitable and sustainable form of transport. Among the main scientific fields, engineering leads in research. The keyword analysis shows that the central theme is electric, and then battery and motor stand out. Community detection was applied to detect the six main clusters of this research, largely dedicated to the following topics: Transportation-Environment, Electrical engineering, Safety, Batteries, Sporting Goods-Urban planning and mechanical Engineering. This manuscript shows the global research trends about the electric bicycle are increasing, and that it should be considered a means of sustainable urban transport and will therefore contribute to energy saving and sustainable energy.

Working principle:

Bicycle runs either by pedaling action or power supply provided by battery. Whenever pedaling action takes place it also charges battery. Battery can also be charged by manually by connecting to single phase supply. Whenever Throttle switch is on battery supplies the power to motor and motor runs either the rear wheel which in turns runs the bicycle. Cycle speed is controlled by motor controller which is adjusted by Throttle.

Key parts:

Batteries: Battery is one of the most important components of any e-bike and also the most expensive. It depends on the battery how much the bike can be used without recharging, how long it will work, how much it weighs…, In general, when you choose an electric bike, the battery is the component that you must pay attention to.

E-bikes use rechargeable batteries, electric motors and some form of the control. Battery systems in use include sealed lead-acid(SLA),nickel-Cadmium(Nicad), Nickel-metal hydride(NiMH) or Lithium-ion polymer(Li-on).Batteries vary according to voltage, total charge capacity(amp hours), weight, the number of charging cycles before performance degrades, and ability to handle over-voltage charging conditions. The energy costs of operating e-bikes are small, but there can be considerable battery replacement costs. The lifespan of a battery pack varies depending on the type of usage. Shallow discharge/ recharge cycles will help extend the overall battery life.

Range in a key consideration with e-bikes, and is affected by the factors such as motor efficiency, battery capacity, efficiency of the driving electronics, aerodynamics, hills and weight of the bike and rider. Some manufacturers, such as the Canadian Bionx or American vintage Electric bikes, have the option of using regenerative braking, the motor acts as a generator to slow the bike down prior to the brake pads engaging. This is useful for extending the range and the life of brake pads and wheel rims.
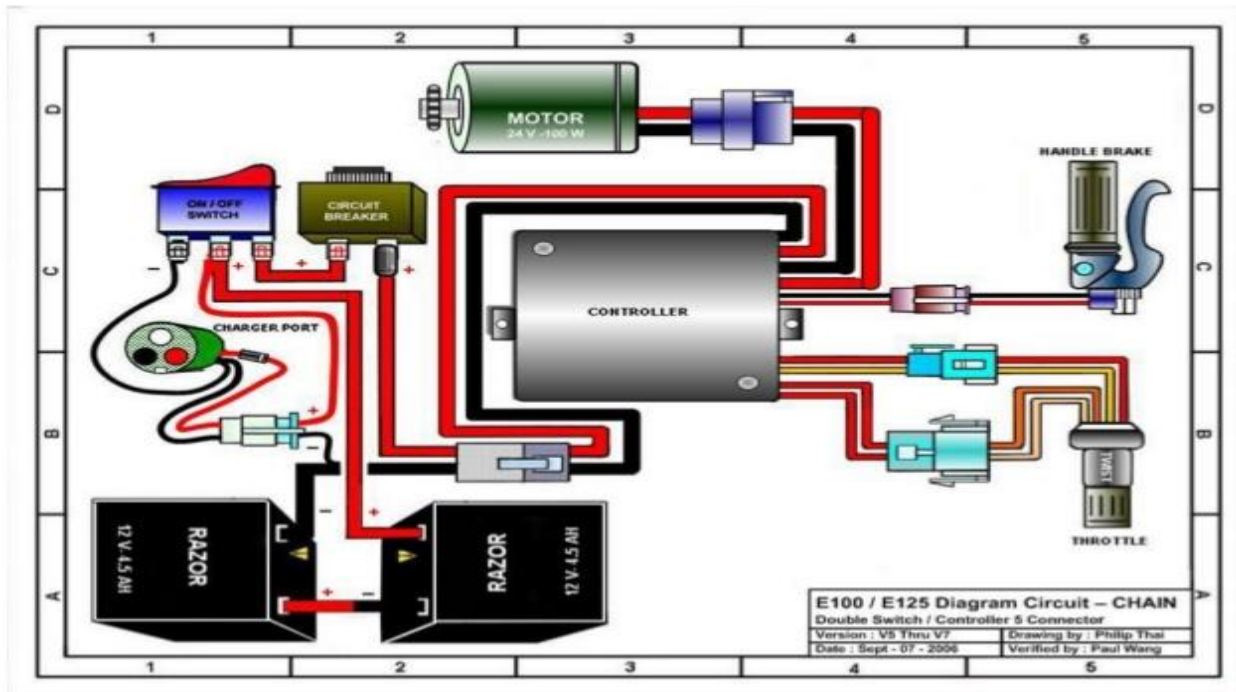
Motor:

Geared hub motors: Geared hub motors operates like direct drive hub motors, expect that within the hub, there's an electric motor that spins at a much higher speed. That motor's shaft connects to a series of planetary gears that connect to the hub, spinning the hub at a lower speed. This method generates more torque, but less top-end speed. Geared hub motors tend to be smaller in diameter than the direct-drive motors because they do not need as large of a motor to generate the same amount of torque on the wheel, but the planetary gears also make the hubs wider. The motors also include a freewheel: That means there is no potential for regenerative braking, but they will cost freely instead of creating minor drag when they are not under power, which makes geared hub motor equipped e-bikes ride more like traditional bicycles.

Controllers:

E-bikes require high initial torque and therefore models that use geared hub motors typically have hall sensor communication for speed and angel measurement. An electronic controller provides assistance as a function of the sensor inputs, the vehicle speed and the required force. The controllers generally allow input by means of potentiometer or Hall Effect twist grip, closed loop speed control for precise speed regulation, protection logic for over voltage, over current and thermal protection. Bikes with a pedal assist function typically have a disc on the crank shaft featuring a ring of magnets coupled with a hall sensor giving rise to a series of pulses, the frequency of which is proportional to pedaling speed. The controller uses pulse width modulation to regulate the power to the motor. Sometimes support is provided for regenerative braking but infrequent braking and the low mass of the bicycles limits recovered energy. An implementation is one of application.

Block diagram:

E100 / E125 Diagram Circuit – CHAIN
Double Switch / Controller 5 Connector
Version : V5 Thru V7   Drawing by : Philip Thai
Date : Sept - 07 - 2006   Verified by : Paul Wang

Features:

1. Pocket friendly: E-bikes have come as a great rescue. They have a great mileage per charge and when compared with their petrol-driven vehicles. They are certainly less costly. Moreover, If one charges the battery with green solar power, It is simply the case of "100% savings".

2. Environmentally friendly: There is no carbon emission. By using e-bike, we can make our small contribution towards mother earth. Further, as these are exhaust- free, there is no need to get "pollution control" certificate everytime from authorities.

3. No sound pollution: E-bikes do not emit any kind of sound.

4. Easy to maintain, less hassle: E-bikes use less machinery as compared to motor wires, easier to maintain

5. No more or little insurance premiums: As e-bikes do not come under the category of motor vehicles due somewhat less powerful motors and speed regulation.

Applications:

1. For travelling in urban areas and also extensively useful for 20-30 km work place.

2. Generated energy can be used to glow bulbs in remote areas where electricity is not reached yet.

Future scope:

1. E-bike leads to pollution free India

2. Accessible by the common man economically.

Working model photos:

Conclusion:

As there is synchronization between the electric motor and ICE propulsions, less petrol consumption can be seen with less charging cycle of batteries (Long life for charge). If one vehicle can save about average of 30% of petrol fuel can be conserved by using this type of cycle. Electric bill can be saved.

"Purchase Electric Bike- Save our Mother Earth."

Done by:

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A.Lavan   : B141639

T.Kushal   : B141941

Manusha   : B141479

B.Hema Satish kumar   **:** B151550

2. ARDUINO BASED UNDERGROUND FAULT DETECTION

Objective:

The objective of this project is to determine the distance of underground cable fault from base station in kilometers using arduino board. The underground cabling system in a common practice followed in many urban areas. There are many electrical, telephone and other signal cables are laid underground.

Many time faults occur due to construction works and other reasons. At that time it is difficult to dig out cable due to not knowing the exact location of the cable fault.

Short circuit fault:

Short circuit can be determined by measuring resistance between two cables at one end. The value of resistances tells us the exact location of short circuit.

Finding the fault in the cable (Normal process)

1. Finding the type of a fault in underground cables using a megger should not be a difficult task.

2. Cable tumping for locating underground cable faults. To find the location of cable using the tumping method; a tumper is set to tump repeatedly and then walking along the cable route to hear the tumping sound.

3. Time domain reflectometer (TDR):

A Time Domain Reflectometer sends a short-duration low energy signal at a high repetition rate into the cable. This signal reflects back from the point of change in impedance in the cable.

TDR works on the similar principles as that of RADAR. A TDR measures the time taken by the signal to reflect back from the point of change impedance.

Operating principle:

For Underground cables (UC) fault detection, we use the concept of Ohm's law. Underground cables have many types and it has different resistance that depends on the length of the cable.

The low DC voltage is applied all the feeder end through series resistor (cable lines), the current would be vary depending upon the location of fault in the cable when, there is short circuit (line to ground), the voltage across the series resistor change accordingly, which is then fed to in build ADC of Arduino to develop precise digital the set of resistors representing cable length in meters and fault is created by the set of suitable switches and every instant in meters.

Working principle:

1. In this project, the fault in cables by switching the buttons.

2. The project uses 4 sets of resistances in series representing cables

R phase: R1 and R2

Y phase: R3 and R4

B phase: R5 and R6

Ground: R7, R8, R9

3. Each series resistors represent the resistance of underground cable for specific distance (100m)

4. 3 relays are used to common point of their contacts are grounded while the points of input resistance R1, R3 and R5 to 3 phase as input.

5.The common point of R7 and R9 is connected to pin of Ao which is ADC(Analog to digital) pin in arduino while any of the 6 switches are operated they impose to create fault on respective phases.

6. The program while executed continuously scans by operating the 3 relays in sequence of 1sec interval.

7.Thus, any point while driven to GND through the common contact point of the relay, thus the current flows and if any of the fault switched is pressed the fault is occurs, depending on the created fault.

8. Thus, the voltage drop at the analog to digital pin varies depending on the current flow which is inversely proportional to the resistance value representing the length of cable in meters. This varying voltage is fed to ADC to develop 8 bit data to the micro controller analog port. Program while executed displays an output to the LCD display depend upon the distance of the fault occurring in meters.

9. Whenever no fault occurs display shows NO FAULT

10. Whenever fault occurs on any of the phase

R phase: R phase

      Dist: 100m

Y phase: R phase

      Dist: 200m

B phase: B phase

      Dist: 100m

Block diagram:
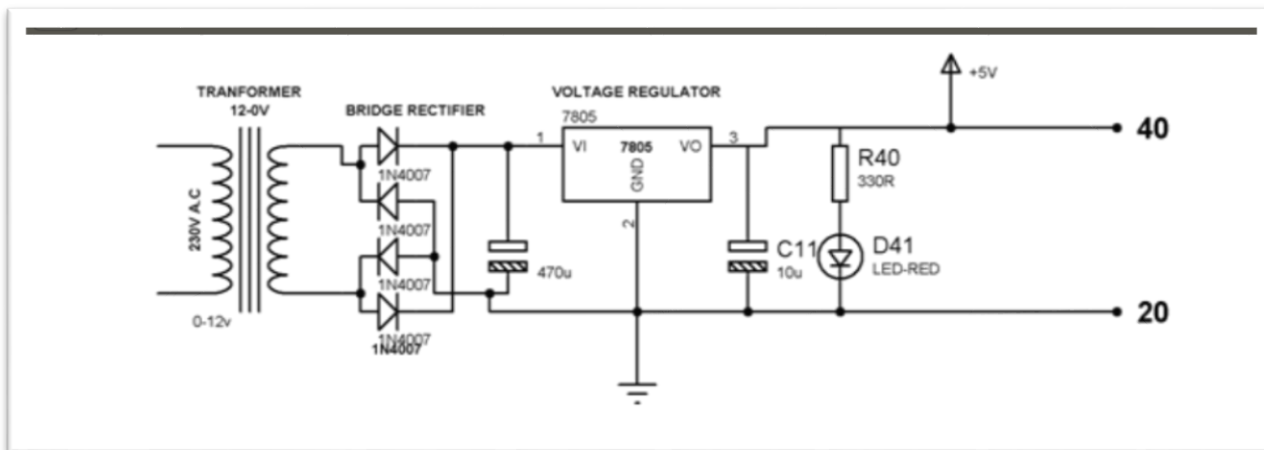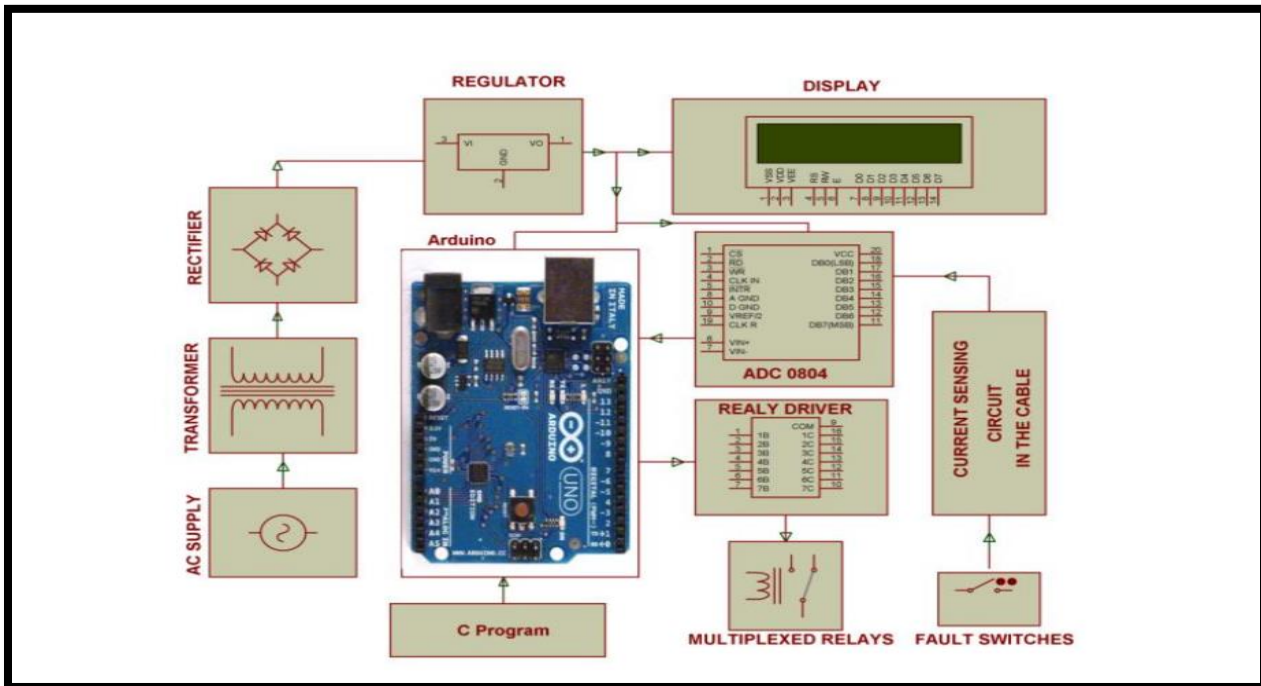
Features:

1. Low maintenance of project.

2. Improved public safety

3. Less consumption of power.

4. Easy to handle.

Applications:

1. In the rural and urban areas where underground transmission system is used.

2. So fault can easily locate and extinguish.

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Future scope:

Advancement in the underground supply and its protection will be developed.

Working models photos:

Done by:

Bhavitha   : B151112

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M.S.Lavanya : B151045

3. <u>SOLAR TRACKING SYSTEM</u>

Objective:

The objective of this project is to control the position of a solar panel in accordance with the motion of the sun.

Operating principle:

Light dependent materials (LDR'S) are used as sensors .The difference in output is used to generate error signals. In these systems for instance, when the outputs of eastern and western LDR'S become equal, the east to west tracking ends. A computer or a processor calculate the sun's position from formulae (or) algorithms using its time/date and geographical information to send signals to the motor orient the apparatus in such direction where illumination of sensors become equal and balanced.

Working:

LDR'S are used as the main light sensors. Two servo motors are fixed to the structure that holds the solar panel. The program for Arduino is uploaded to the microcontroller. The working of the project is as follows. LDR'S sense the amount of sunlight falling on them. Four LDR'S are divided into top, bottom, left and right.

For east-west tracking, the analog values from two top LDR'S are compared and if the top set of LDR'S receive more light, the vertical servo will move in that direction. If the bottom LDR'S receiving more light, the servo moves in that direction.

For analog deflection of the solar panel, the analog values from two left LDR'S and two right LDR'S are compared. If the left set of LDR'S receiving more light than the right set, the horizontal servo will move in that direction.

If the right set of LDR'S receiving more light, the servo moves in that direction.

Block diagram:
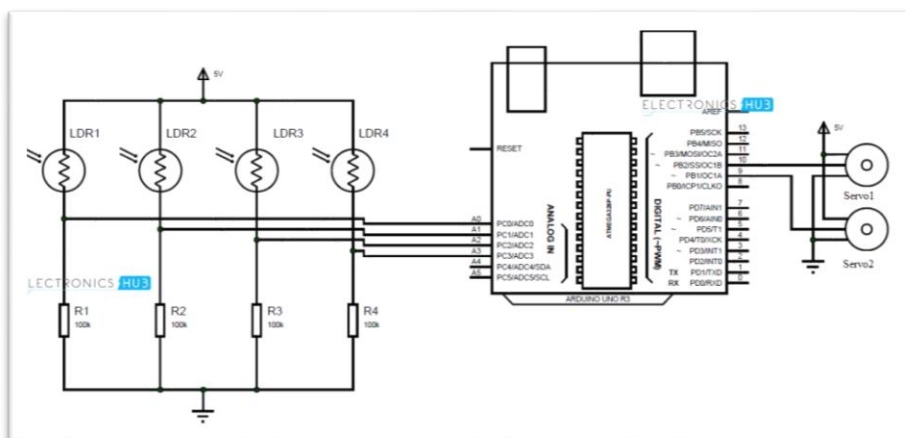
Features:

1. 360 degrees of dual axis tracking to maximize power production up to 45% over fixed systems.

2. Compatibility with 20 or 24 of most commercially available 60 cell or 72 cell modules.

3. An individually tested pre-engineered system.

4. A modular approach, easily scalable for projects that are large and small.

Applications:

1. Street light applications without using normal power supplies.

2. Used for small and medium scale power generation.

3. For domestic backup power system.

4. In remote areas implementing a small power systems unit at each home.

Future scope:

We can use solar tracker for efficient charging of battery from solar energy. It also helps to generate more power by means of solar. If we want to increase the load this will be one of the most efficient method.

In future, the conventional energy is not sufficient for use. So there will be a need of using non conventional energy sources.

Working models photos:

Done by:

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Telse Vikas   : B161916

Penagari Sagar : B161532

4. SOLAR ENERGY MEASURING SYSTEM

Objective:

This project aims to develop a measurement of solar energy using Arduino board technology. In this project, three parameters that been measured are temperature, voltage and light intensity.

Working principle:

There are power stations for maintaining or monitoring the power circuits or parameters related to solar panel. Parameters like temperature light intensity and voltage, which are important to monitor.

In this circuit all the parameters are in the analog form. We need to only convert them into digital form and display these digital values on the LCD (Liquid crystal display). Some additional circuit is also required for proper measurement.

The project uses a solar panel to monitor sunlight and Arduino board which has ATmega family microcontroller attached to it. The project requires on LDR (Light dependent Resistor) sensor, for measuring light intensity, a voltage divider or voltage sensor to measure voltage and a temperature sensor (LM35) used to measure temperature. These measurements are then displayed by the microcontroller to a LCD screen. Thus this system allows user to effectively monitor solar parameters using this system.

Block diagram:

Circuit diagram:

Principle:

The project is based on Arduino programming and sensors like LDR, LM35 and voltage sensors.

Voltage measurement: Voltage measurement of the solar panel is very easy which is up to 5Volts but if we want to measure more than 5 Volts then we have to use some additional circuitry like voltage divider. This circuitry changes according to voltage, which means how much voltage we have to measure.

For measuring voltage we have to follow the given formula.

Voltage = (Analog value/resistor factor)*reference voltage.

Where,

Analog value= Analog output of voltage divider

Resistor factor=1024.0/(R2/R2+R1)

Light Intensity measurement: Light intensity is also easy to execution in the project like the voltage measurement here we are using a resistor and a LDR connected with each other and middle points is used as output. As light falls on LDR, resistance of LDR decreases.

Temperature measurement:

For measuring temperature here we have used LM35 that is gives 10mV for every 1 degree Celsius. Circuitry in simple for this. By using given formula we can calculate Temperature in degree Celsius;

Temperature=Analog value*(5.0/1024.0)*100;

Where 5 is reference voltage.

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Features:

1. In this project we can easily find out the parameters of solar panel.

Applications:

The monitoring of three parameters is also important in household purpose.

Future scope:

In the industrial applications and power stations we can easily find out the solar parameters.

Working models photos:
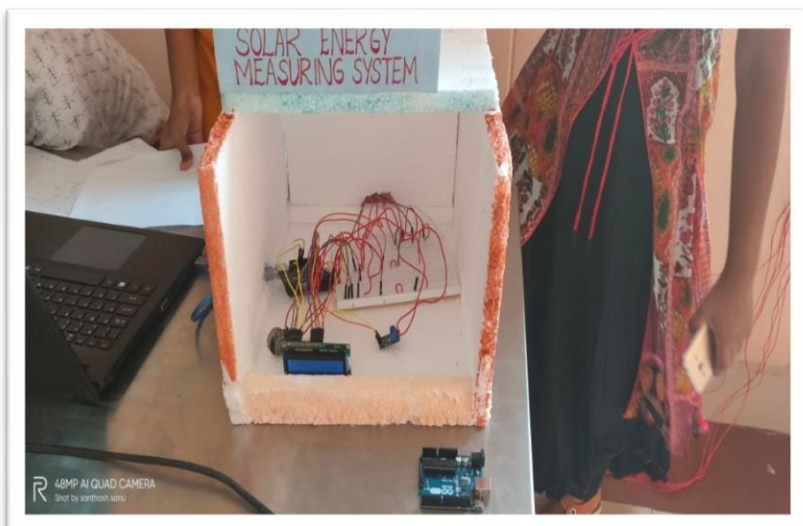
Conclusion:

We have presented work on design and development of solar parameter reading using arduino for environmental monitoring, the mode is enough to provide information about environment parameters such as temperature, voltage and light intensity.

Done by:

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R.Uma   : B151579

5. IOT BASED SMART ENERGY METER

Objective:

The IOT based smart energy meter mainly aims at the middle class and the lower middle class family to bring their electricity bill down with the help of power consumption alert system and monitoring system.

Operating principle:

We all know about electricity energy meters which are installed in everyone's house or offices to measure the electricity consumption. At last of every month, many of us get worried about the high electricity bill and we have to look at the energy meter once in a while, but what if we can monitor our electricity uses from anywhere in the world and get on SMS/E-mail when your energy consumption reaches to a threshold value. Here we are building an IOT based project of energy meter.

In this project we make a smart Electricity meter using arduino and "ESP8266" Wi-Fi module which can not only sends you a SMS or e-mail of your electricity bill but also you can monitor the energy uses anytime and anywhere in the world.

Here we have used blinks from calibrate LED from energy meter to measure the energy consumption. We have taken the help of IFTTT platform to link our wifi module to SMS or e-mail notifications.
We have used IFTTT app to monitor our energy uses, through triggering value and we also used MQIT dashboard android app to monitor the energy usage.

Working:

The watt-hour LED in the energy meter blinks 3200 times for every KWH. The LED indication is used to measure electricity that is being consumed. This LED blinks using the electricity is consumed. This impulse is given as input to the arduino from anode and cathode terminals of the LED to A1 and ground (GND) pins respectively with the help of a counter the no of impulses can be calculated and hence the amount of energy consumed.

The pulse from the meter is used to interface it with the arduino. We have taken the meter with 3200 pulses/KWh for which we have calculated the energy consumed per unit pulse.

Here 1 pulse= 0.000212 KWH [1/3200=0.000212]

We declared a variable count to count the number of pulses by using the following formulae we calculated units and cost.

Unit=count*pulse

Cost=unit*energy tariff

We have displayed these values on the LCD (Liquid crystal display) to monitor the energy usage in houses.

The ESP8266 wifi module is used to connect arduino with the wifi- network arduino sends the units and cost values to wifi module using serial communication.

To monitor our energy uses over the internet, we have to use MQTT broker. We will use MQTT broker as AdaFriut 10 platform and follow the below process to make this IOT energy meter.

1. Setting up an Ada Fruit account for storing electricity meter readings by creating dashboard which displays the date of the energy consumption and the cost.

2. Create applet in IFTTF for triggering SMS or e-mail for energy meter.

We have used an android app for monitoring the values through MQTT dashboard android app.

Circuit diagram:
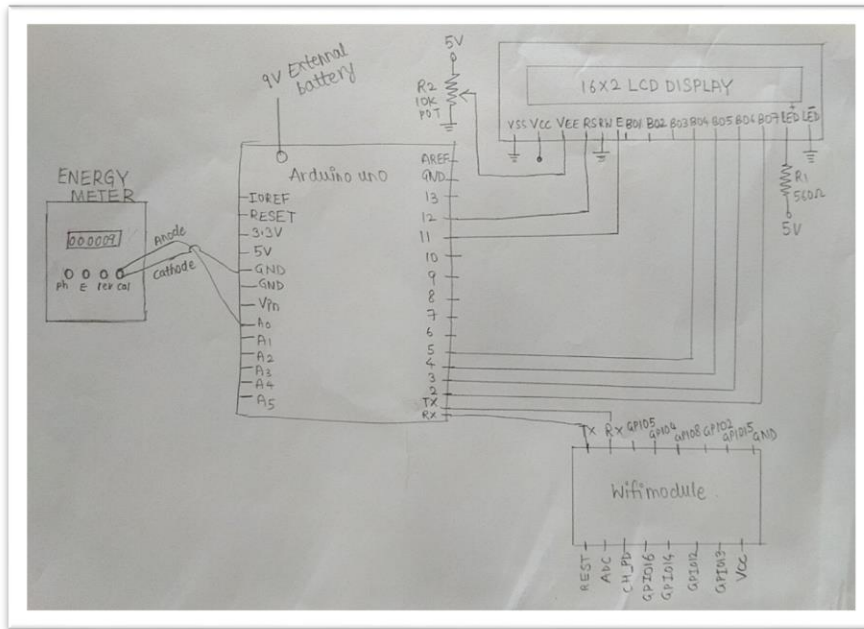
Features:

1. Continuous monitoring of energy usage
2. Triggering SMS or e-mail when the threshold value is reached.
3. Additionally we display electrical energy in terms of cost and units which is not present in meters.

Applications:

1. Monitoring the energy usage continuously.
2. Getting an alert message to reduce the energy consumption.

Future scope:

We can know the units consumed by each and every appliance in our home.

Working models photos:
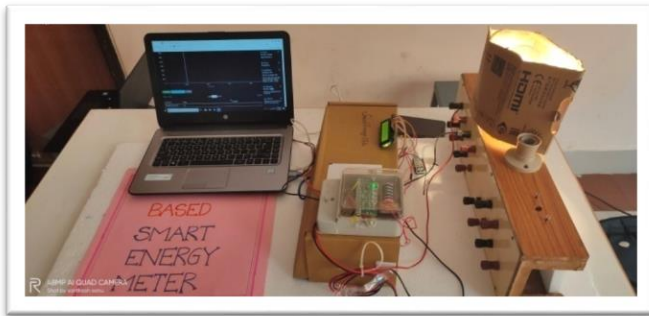
Conclusion:

The smart energy meter is designed to give continuous insights of the bill to the electricity energy consumers based on consumption of energy.

Done by:

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Pavan   : B161001

Sukanya   : B161122

Srisai   : B161235

6. SOLAR BASED CONVEYOR BELT

Objective:

This project is designed to carry the load from downstream to high stream or from one point other point for long duration and distance and to reduce labor cost which massively increases productivity, time and efficiency.

Working:

Generally conveyer belts are used to take the load from one place to another place which is laid on a straight path. But our solar conveyer belt is in a slant position which is used to take the load from lower level to higher level. We generally use this model to in constructions, factories, industries, where the goods on construction materials are needed to shift from lower stream to higher stream.

Coming to the construction of this is , the arrangement is made is such a way that the motor shaft is coupled with a rod is inserted in between the two 'H' shaped stands at the lower end and the three bearings are fixed to a iron rod in between the two stands at the higher end. A belt is being tightly fixed upon the lower and higher ends. The buckets are made in such a way that it takes the load by itself without automation. The supply to the motor is given by solar panel. We have connected the solar panel to a charge controller where it can regulate the fluctuations in the voltage to the battery and to the load. During day time the charge controller will charge the battery as well as it supplies power to load. And a switch is connected in between the motor and battery.

Whenever the switch is in "ON" position the solar panel will supply power to the motor from the battery, as soon as the motor shaft starts rotating the belt which is lied tightly upon it start moving the buckets will take the load in and moves along with belt as they are fixed upon the belt, at the higher the bearing are rotating and when the buckets reach from lower and the higher end it dumps the load and moves back to the lower end to take the load again.

We have arranged the buckets very specifically so that no interrupts will occur. And the shapes of buckets are different and no need of any sensors, automatic door opening to load the buckets. If we want we can implement it.

Thus the load is carried using this solar bucket based conveyor belt in an effective manner.

Principle:

It works on the principle of motors shaft mechanism.

Block diagram:
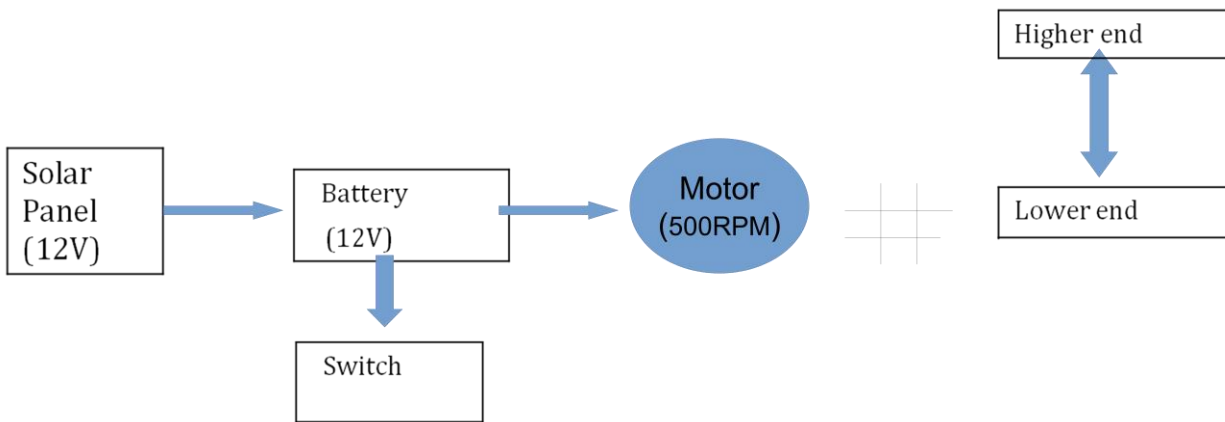
Features:

1.The main specification of this conveyor belt, is the bucket are manufactured in such a way that they can take the load by themselves without any automatic and it shift from lower end to higher end.

2. It is different from existing conveyer belts

3. By using solar energy it reduces the cost of electric supply.

4. It is pollution free.

5. It is also used in places where the load is abrasive, wet, dry, and sticky in nature.

6. It can be inclined, declined or combination of both.

7. Its maintenance is also less.

8. It does not harm the environment.

9. Its installation is little difficult compared to a straight path conveyor belt.

Applications:

1. Mining

2. Industries

3. Construction- Heavy building materials (bricks, rods etc..)

4. Factory production line

5. Agriculture

6. Shopping malls

Future scope:

This solar bucket based conveyor belt is further designed by automation which increases the scope of automatic control of conveyor belt.

Working models photos:

Done by:

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Sk.Tasleem Sulthana   : B151742

Ch.Shailaja   : B151742

7. SOLAR COOLER

Objective:

1. Saving power and electricity

2. Minimizing season wise servicing

3. Varying power consumption at various speeds

4. To enable people of those rural areas which do not have electricity supply to have cool air during summer.

5. Reduce the maintenance cost by replacing the concept of pump

Working principle:
our project "solar cooler" is based on the concept of harvesting solar energy. It is easily interpretable from the name of the project that is based on the solar energy for satisfying is need of power source. The functionality of solar cooler is dissimilar as that of traditional coolers. The solar energy is harvested and stored in the battery

The concept of solar cooler sounds good and economical. Hence almost every class of our society can bear its expenses. The best part is that, it can be used in rural areas where there will be no supply of electricity

Solar modules use light energy from the sun to generate electricity through the photovoltaic effect. The majority of modules are used water-based crystalline silicon cells (or) thin-film cells based on cadmium telluride (or) silicon. The structural member of a module can either be the top of the layer (or) the back layer. Cells must also be protected from mechanical damage and moisture. Most solar modules are rigid, but semi-flexible ones are available based on the thin-film coils.

Electricity is the flow of electrons through a circuit (or) conductive path like a wire batteries

In our project, we have used a DC motor, propeller, DC motor water pump, mesh, solar panel. Whenever the energy is supplied to DC motor, the motor also gets energizes such that it rotates. The motor shaft is connected to the propeller such that the propeller rotates and it gives the air. In our cooler, we have used the mesh whenever the DC motor ware pump is energized; the pump the pump circulates the water through pipes into the mesh. The mesh get wet, so whenever the propeller gets rotate, the cool air will come to outside.

Circuit diagram:
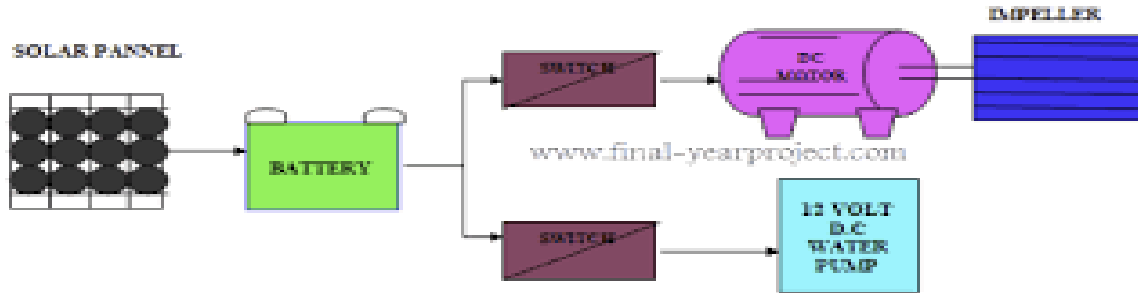
Features:

Instead of AC pump, we have used DC motor water pump. The solar cooler works at voltage of 9v DC and 12v DC water pumping. The solar panel gives 12v and 5W and gives 2.4A. We have made the cooler mostly from wastage like dustbin, grass. This is very easy to make in our home. It has less initial cost and zero running cost

Applications:

We can use solar cooler in

1. Home

2. Small industries

3. Offices

4. Schools

Future scope:

In traditional coolers, Chopper is used for reduction of speed whereas in our cooler, we have used 1500 rpm 12V dc motor. We can make this in our home. As solar is emerging technology in now a day we can install this with less initial cost.

Working models photos:

Done by:

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Jayanthi   : B151077

8. <u>SOLAR INDUCTION HEATING</u>

Objective:

The objective of this project is to melt a metal without pollution and without contact. It doesn't require any flame. It involves only the metal parts to be treated and it is highly efficient and has no power loss. It requires very less time when compared with other heating processes. It is human safe and the heating processes controllable. As the population is increasing, the power consumption is also increasing and the scope for renewable power supply is much more. So, here we use power in order to heat the metal etc. Solar power is taken as input

Principle:

It works on the principle of electromagnetic induction and joule heating. When the metal pieces to be heated (work piece) is placed near the work coil the eddy current induces on the work piece and flows against the resistance of the work piece and thus by the principle of joule heating, heat is generated and the metal is heated up.

Working:

The supply is taken from the solar panel and the battery is charged using Solar panel. The input is given to the circuit using a battery the given DC input is converted into high frequency AC current by the oscillating circuit which has been built with the combination of inductors and capacitors. The combination of inductors and capacitors convert the DC current into AC current and the MOSFET's increase (amplify) the frequency of the AC current. Here the MOSFET's are used in switching purpose when one MOSFET conducts the other MOSFET gets off. This switching occurs thousand times a second and thus high frequency is generated. When this high frequency AC current flows through the work coil, it produces alternating magnetic field across the coil. When a metal which is to be heated is placed in the work coil, eddy currents starts flowing in the coil against the resistivity of the metal and thus by the principle of Joule heating. Heat is generated in the metal and metal is heated up
Everywhere we see that eddy current are usually considered as losses but here it has become a source of heating.

Circuit diagram:
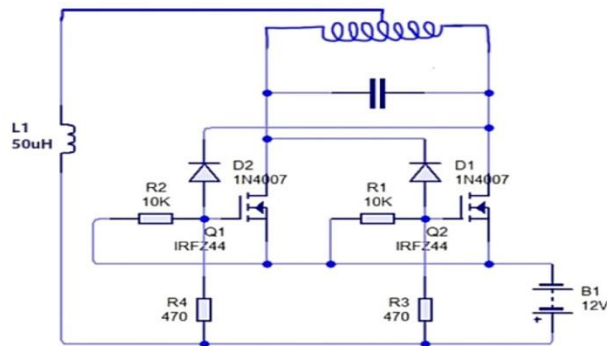
Applications:

1. Heat treatment of metals (Hardening, Annealing, tempering)
2. Soldering, Brazing, Forging
3. Induction stove, Induction cooker, etc works on the same principle
4. Induction furnace
5. Besides metals, heating of liquid conductors and gaseous conductors is also possible by induction heating

6. Solar induction heating can be used at places where there is no electricity
7. It can be used for welding of plastics which are doped with ferromagnetic ceramics

Advantages:

1. Solar is a renewable source with no pollution.
2. Less maintenance for solar supply.
3. It is a non contact process.
4. It is human safe as there is no contact.
5. It has no pollution.
6. It is efficient and takes much less time.
7. It can be controlled by the input supply.

Factors to be considered:

1. The induction heating process is used for metals and conductive materials.
2. While applied on magnetic materials, heat is generated by both eddy currents and hysteresis effect.
3. The metals to be heated should have more magnetic permeability and less resistance.
4. High the frequency of AC current, eddy current production is more.
5. The metal placed should be easily removable with flatter surface.

Future scope:

1. At power consumption is increasing; the scope for renewable sources is increasing. So we are using solar as the supply.
2. We can use this solar induction heater. The replacement for furnaces and for coal based machines as they produce more pollution.
3. We are using induction heating at only some places like making food using induction stores, but it has many more applications and can be used for various purposes as for welding, brazing, Annealing etc

Working models photos:
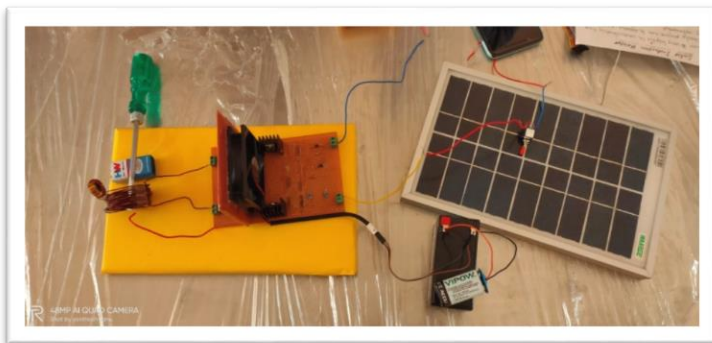
Done by: Bayi Vinay(B161476), E.Jayanth(B162093), K.Manisharan(B162166), G.Rohith(B161965).

9. SOLAR GSM BASED HOME AUTOMATION

Objective:

The main purpose of the project is to provide a smart way to access or control our home appliances by simply sending through mobile. Arduino UNO and GSM module interfaces with each other to control whole system. Solar power used here for controllation and usage of appliances which can reduce pollution and by freely available

Working:

1. Here GSM (global system for mobile communication) and arduino UNO communicates with each other and transmits and receives information through RX and TX (Transmitter and receiver pins)
2. GSM works as a mobile network connecting modem
3. Initially the code is dumped in the Arduino
4. SMS should be sending through mobile from user
5. Device to be ON/OFF to be decided
6. When we send SMS from GSM module by mobile then GSM receives the message and sends it to arduino UNO
7. Now arduino reads the SMS and extract main command from the received string and stores in a variable
8. After this, arduino compare the string with predefined string
9. If match occurred, then Arduino sends signal to relay
10. The relay acts according to the instructions given by arduino, it ON and OFF the home appliances
11. Relative result also prints on 16*2 LCD by using appropriate commands
12. If the received keyword doesn't match with the desired keyword then the whole operation stops there
13. Here in this project we are using 2 LED and 1 fan for demonstration.

Block diagram:
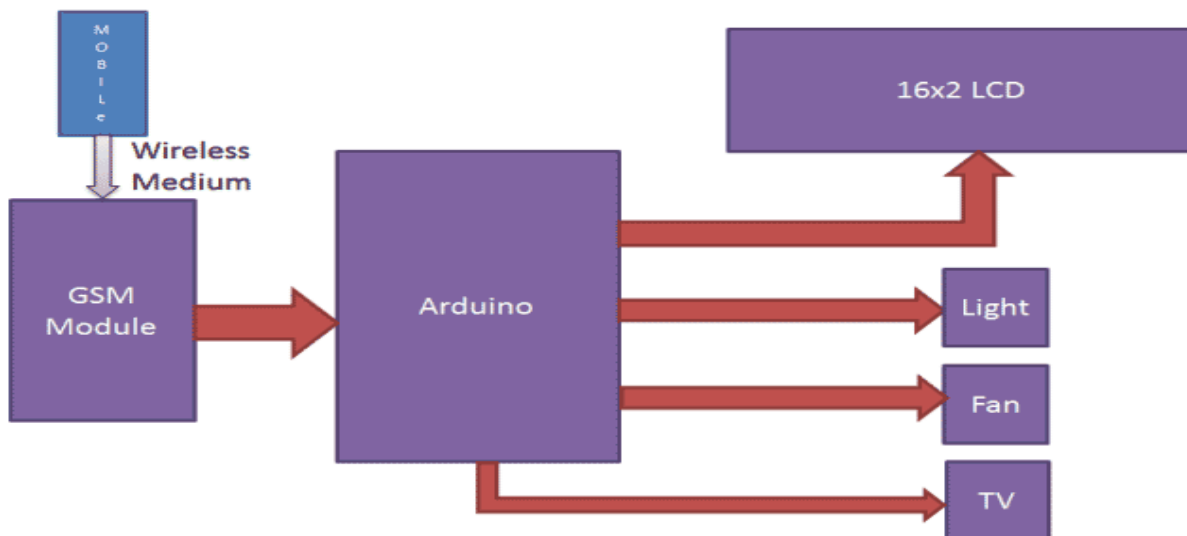
Features:
1. Accessible from anywhere and any place where mobile network is available
2. No requirement of internet
3. No requirement of smart phone. It can be accusable from small Nokia phones
4. One time installation and many years benefit
5. Simple accessibility

Advantages:

1. Simple and easy to access
2. Accessed from remote area
3. No requirement of internet
4. Low cost for controllation of home appliances
5. Reduction of electricity bill
6. High installation cost but used for many years
7. Applicable for any type of loads
8. Eco friendly and cost effective
9. More benefit for physical handicapped and senior citizens
10. makes the life simpler and comfortable
11. Used for security purposes
12. It saves electricity

Applications:

1. Home security system
2. Burglar alarms
3. Smoke detection

Future scope:

With the combination of arduino and GSM, this project is not only a modern approach to next generation home but also a very friendly and easy to use system. This project will give our daily life a new dimension. At the same time it will help us to save energy

Working models photos:
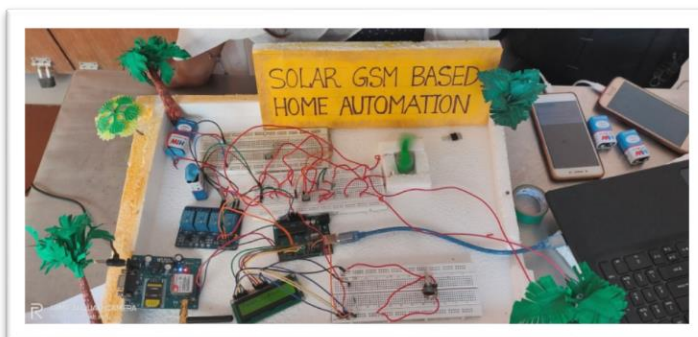
 Done by: M.Thukkubai(B151593)**,** K.Srilekha(B151398), K.E.Amrutha Varshini(B151885)

10. SOLAR WATER PUMP

Introduction:

Solar water pumping system is an important and popular application of solar photovoltaic modules. This is specially designed to lift water for irrigation and domestic uses.

Principle:

This system operates on power generated using solar PV system. The photovoltaic array converts the solar energy into electricity which is used for running the motor pump set. The pumping system draws water from the open well. The system requires a shadow free area for installation of the solar panel

Working:

Solar energy is a clean, inexpensive, renewable power source that is harness able nearly everywhere in the world any point where sunlight hits the surface of the earth is a potential location to generate solar power. Solar energy is captured in a variety of ways, the most common of which is with photovoltaic solar panels that converts the sun rays into usable electricity

Solar panel consists of a layer of silicon cells, a metal frame, a glass casing unit, and wiring to transfer electric current from the silicon. Silicon is a non metal with conductive properties that allow it to absorb and convert sunlight into usable electricity. When light hits a silicon cell, the light causes electrons in the silicon to be set in motion, initiating a flow of electric current

The generated electricity is given to pump which consists of a motor whose shaft is connected to an impeller. When impeller rotates, it creates partial vacuum (low pressure), due to which water is sucked into the pump and the rotator forces cause water to flow out of the pump

Block diagram:

Fig 4. Block Diagram of SDPS

35
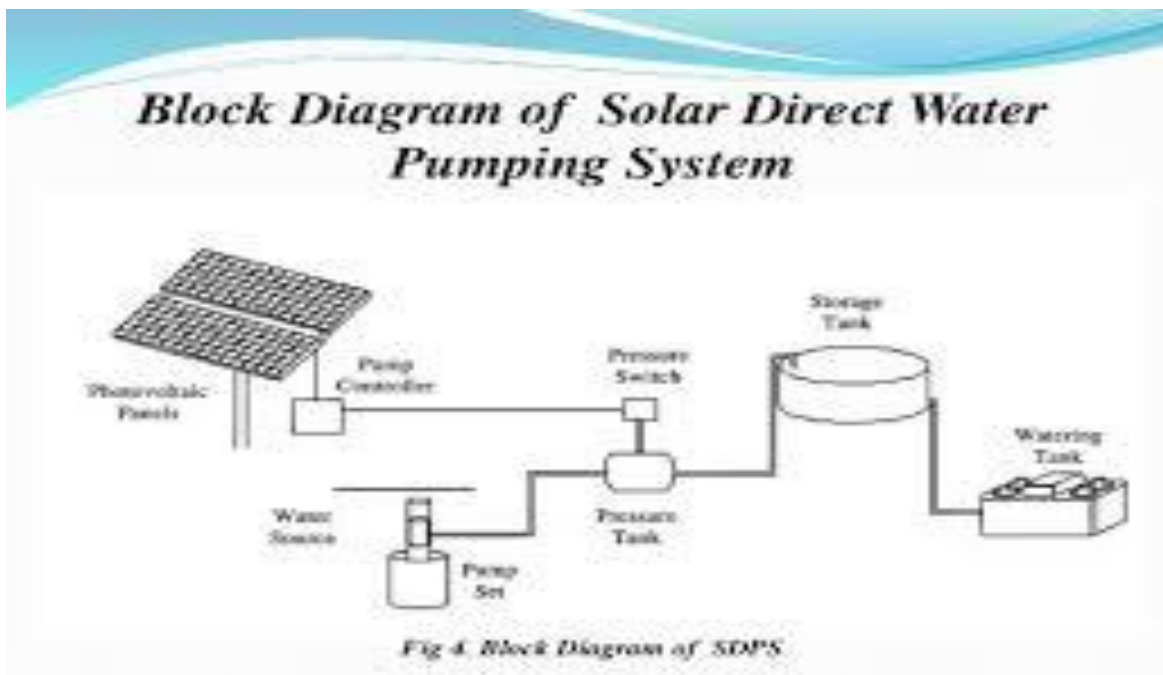
Advantages:

1. No fuel cost as it uses available free sunlight.
2. Long operating life.
3. Highly reliable and durable.
4. Eco friendly.

Future scope:

Solar pumps are economical owing to low maintenance cost and operating cost. It reduces the dependency on electricity and it is eco friendly.

Working models photos:

Conclusion:
Photovoltaic power for irrigation is costly comparative with traditional energy sources for small remote applications.

Done by:

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11. SOLAR MOBILE CHARGER

Introduction:

Solar charger is a charger that employs solar energy to supply electricity to devices or batteries. They are generally portable.

Working:

It can change lead acid/Ni-Cd battery. They can be used when no electricity supply is available. Either mains or for example, a vehicle battery and are sometimes suggested a way to charge phones without consuming mains supply. Unlike electrical cell phone charger some can be used as conventional chargers by plugging into an electrical outlet.

Voltage regulator:

Solar panel can produce a range of charging voltages depending on the sunlight intensity. So, a voltage regulator must be included in the charging circuit so as to not over current (over voltage) a device such as 12v car battery
A Solar charger works by supplying constant DC or pulsated DC power source to a battery being charged. A simple charger typically doesn't alter its output based on charging time or the charge on the battery.

Block diagram:
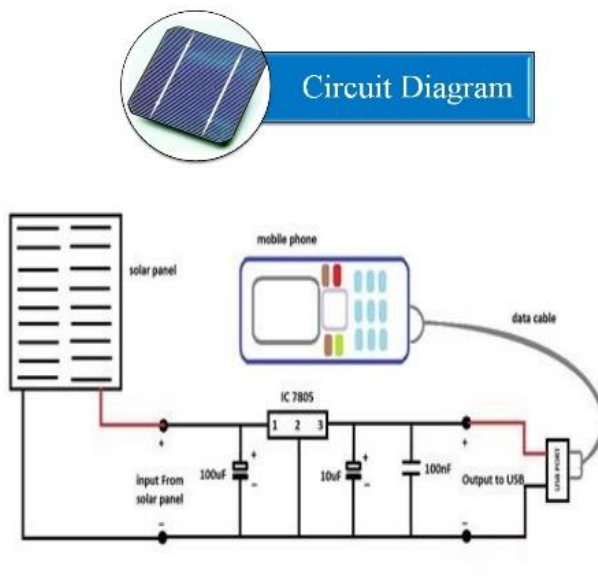
Advantages:

1. It can be used to store energy which can be used later when sun is not available
2. It is portable and can be carried easily to anywhere
3. We don't require an external power source to charge
4. Solar mobile charger ripples will not be there as we use DC power directly to charge the mobile

Working models photos:
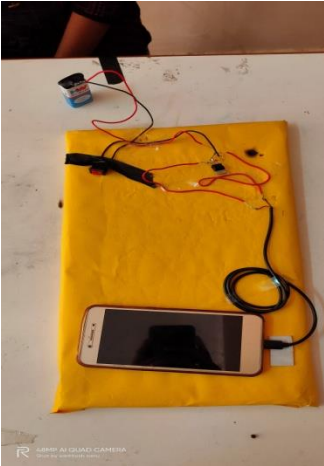
Conclusion:

The main goal is to deliver power from an array of solar panel to a battery. In order to change it, higher efficiency can be obtained.

Done by :

B.Naga Madhavi   : B151061

B.SaiKrupa   : B151389

12. POWER THEFT MONITORING SYSTEM AND WIRELESS COMMUNICATION

Abstract:

 Electricity theft is a major challenge that is experienced in our country. This has an adverse effect on a country's economy. This project discusses a system that detects electricity theft remotely, and a mechanism of curbing electricity theft. The approach used is that the electric current supplied from a distribution transformer is monitored at the distribution transformer side and at the consumer's side, as well. The difference in electrical current monitored from the distribution and consumer sides is used to establish whether electricity theft has occurred or not. The communication between the two monitoring units is based on the use of wireless technology.

INTRODUCTION:

There are many operational losses in the generation, transmission and distribution of electrical energy. The electrical losses at the generation side can be precisely defined. If the technical losses can be minimized, it will result in lower electricity and production costs with better economic growth prospects. Transmission and distribution electrical losses cannot be exactly measured by examining the sending end data. This shows only the connection of non-technical constraints at the transmission and distribution level of electricity. These losses can be projected from the variance of complete energy supplied to the clients. Electricity theft contributes immensely to the non-technical losses which cannot be forecasted.

NON-TECHNICAL LOSSES:

It includes bypassing and interference of electric meters, other physical methods to evade payment, non-payment, and fraud, pre-paid vouchers from stolen vending machines, illegal tapping of electricity from the feeder and tampering with the electricity meters Non-technical losses are caused by external factors to the power system. According to [3] an electric power system cannot be totally secure from electricity theft. Various forms of tampering attempts can be used. These attempts usually take place on electricity meters during shut-downs on the terminals of the meter/meter cables. Hypothetically, finding the illegal usage of electricity should be essentially possible.

BLOCK DIAGRAMS:
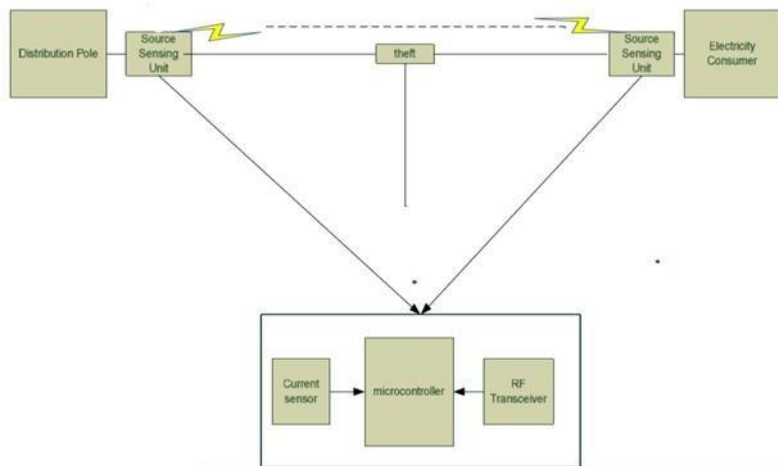
WORKING PRINCIPLE:

The principle used is that the electric current supplied from a distribution transformer is monitored using the current sensor which is interfaced with Arduino UNO board at the distribution transformer side and at the consumer's side, as well. The difference in electrical current monitored from the distribution and consumer sides is used to establish whether electricity theft has occurred or not.

OPERATION:

On the source (transformer side) the current is sensed using ACS712 HALL EFFECT SENSOR and it is interfaced with ARDUINO UNO which is interfaced with RF RECEIVER is on the consumer side the current is sensed by ACS712

HALL EFFECT SENSOR which is interfaced with ARDUINO UNO board and interfaced with RF TRANSMITTER MODULE

It is displayed in Serial Monitor.

• The current through the line is sent and received using RF TRANSCEIVER and then compared using Arduino.

• Under normal operating condition the current sent by transformer is exactly equal to the current consumed by user, so there is no difference in currents .It displays NO THEFT.

• When a unauthorized tampering is occurred on distribution line then there is difference of currents in sent by transformer and consumed by consumer. It displays THEFT DETECTED.

• Theft Detection Model/Algorithm

When the input current transit from the distributor to the consumer, at that time, when the total amount of power is not received by the receiver, then there is a possibility of electricity theft. This is modeled as:

Σ Csent = Σ Cconsumed + Loss $\rightarrow$ No Theft Eq. 1 Σ Csent $\neq$ Σ Cconsumed + Loss $\rightarrow$ Theft Eq. 2

Where:

Csent = the current measured at the distribution point.

Wireless Power Theft Monitoring System

40
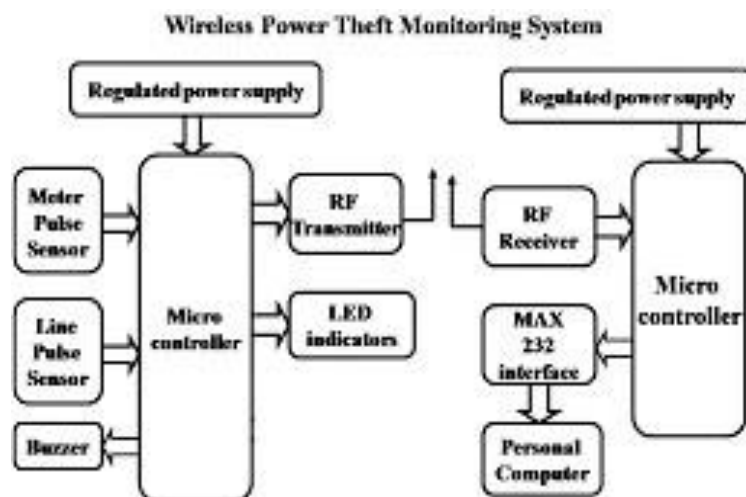
Cconsumed = the current measured by load or consumer side.

Algorithm:

- Define difference threshold

- Received current at consumer (consumed C)

- Measure current at distribution point (sent C)

- Compute the difference (diff = sent C - consumed C)

- If difference greater/equal to energy threshold.

- Theft detected

- Else

- No theft

FEATURES:

1. We can detect electricity theft instantaneously

2. Buzzer sounds till the electricity theft occurs and stops as soon as it is removed

3. We can also tell how much electricity is being theft

APPLICATIONS:

1.   Used in areas where electricity theft is frequent especially in rural areas and interior places.

FUTURE SCOPE:

1. We can send SMS to the monitoring person in the substation using GSM MODULE.

2. Trying to find the exact location of the theft.

WORKING MODELS PHOTOS:

CONCLUSION:

Using this project electricity theft can be controlled and it can save our country's economy and reduces electricity losses.

Done by:

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13. DYNAMIC WIRELESS CHARGING OF A ELECTRICAL VEHICLE

Objective:-

To charge the electric vehicle in static (car is in Stationary condition) and dynamic (Car is running condition) condition.

Working principle:

It works on the basic principle of inductive coupling like transformer.

Operation:

Wireless power transfer can be done by inductive coupling process. Inductive coupling can be done in both stationary and dynamic conditions EV .In this process primary coil (TRANSFER COIL) is fixed at the road side and secondary coil (RECEIVING COIL) is fixed at the vehicle side. Whenever primary coil excited with the high frequency ac voltage magnetic flux will be created and it will be coupled with the secondary coil and EMF will be induced in it which is like transformer action. The induced AC EMF is converted into DC by using rectifier and power will be stored in battery which is used to run the EV.

Circuit diagram:
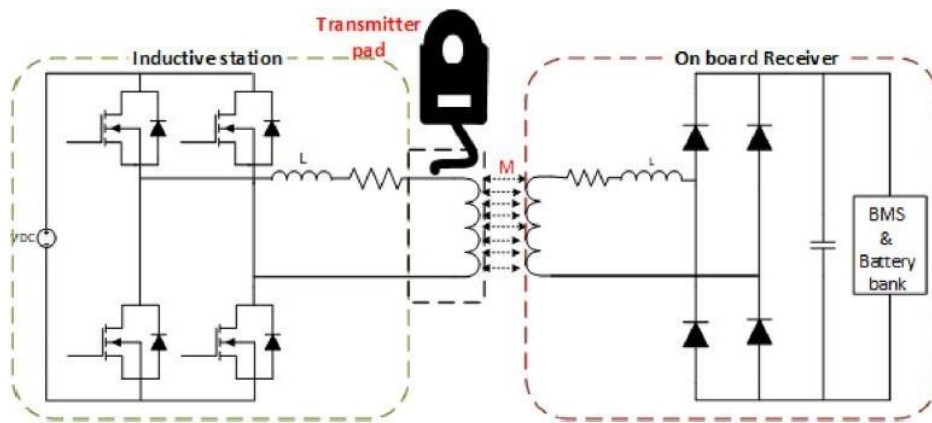
Block diagram:
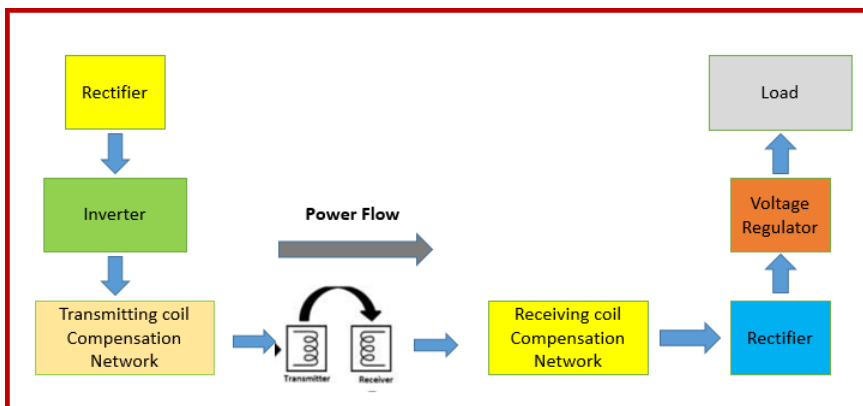
Systematic view of the project:
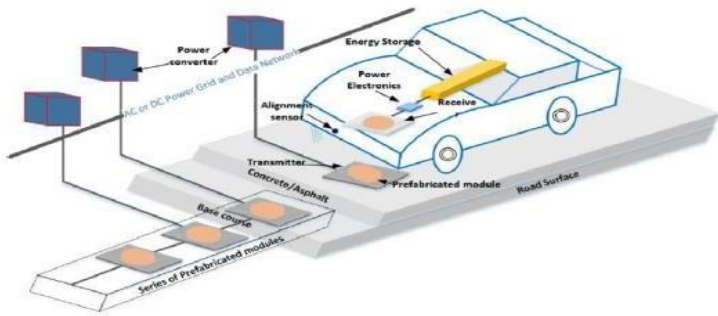
Features:

1. More space is available in the car due to the wireless charging technique.

2. It can charge fastly.

Applications:

The electric vehicle can charge in the static (At place like traffic signal, bus stops and bus stations) and dynamic (moving) condition.

Advantages:

1. Full autonomy.

2. Charging station is not required.

3. User friendly.

4. More efficient.

5. Reduces the time to charge the battery (Consumer need not to wait ,he can charge the battery while he is in motion)

6. We can use smaller battery units which Decreases the weight of the vehicle and increases the space in the vehicle.

Future scope:

Wireless charging technique has good future scope because, by 2040 50% of the transportation system will be replaced by the electric vehicles and it leads to increase in the charging stations to charge the EV. So dynamic and static wireless charging of electric vehicle is one of the best methods to charge the electric vehicle which can be implemented in future.

Working models photos:
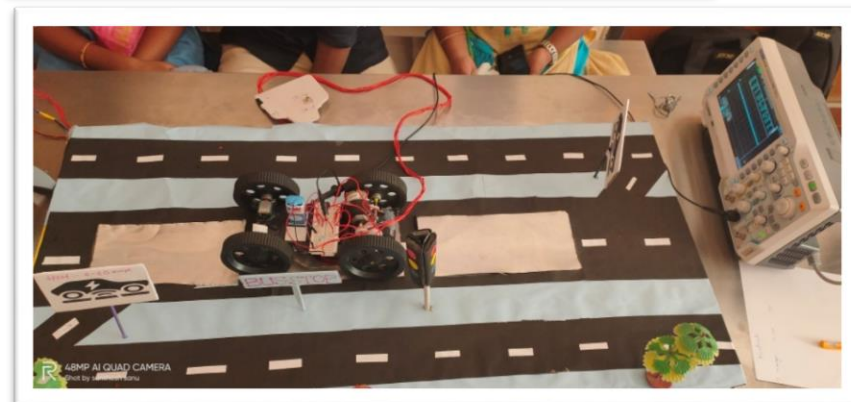
Done by:

Vikas Kota   : B151430
Sumanth Pothuraju   : B151382

14. SOLAR REFRIGERATOR USING PELTIER MODULE

INTRODUCTION:

Thermoelectric cooling uses the Peltier effect to create a heat flux between the junctions of two different types of materials. This effect is commonly used in camping and portable coolers and for Cooling electronic components and small instruments. Applying a DC voltage difference across the peltier module, an electric current will pass through the module and heat will be absorbed from one side and released at the opposite side. One module face, therefore, will be cooled while the opposite face simultaneously is heated.

On the other hand, maintaining a temperature difference between the two junctions of the module, a voltage difference will be generated across the module and an electrical power is delivered.

See Beck Effect:

In 1821, Thomas See beck found that an electric current would flow continuously in a closed circuit made up of two dissimilar metals, if the junctions of the metals were maintained at two different temperatures. Thermoelectric power supply generators are based on the See beck effect which is based on voltage generation along a conductor subjected to a gradient of temperature.

When a temperature gradient is applied to a conductor, an electromotive force is produced. The voltage difference generated is proportional to the temperature difference across the thermoelectric module between the two junctions, the hot and the cold one.

$\Delta V \propto \Delta T$

Peltier Effect:

In 1834, a French watchmaker and part time physicist, Jean Peltier found that an electrical current would produce a temperature gradient at the junction of two dissimilar metals. The Peltier effect is the main contributor to all thermoelectric cooling applications. It is responsible for heat removal and heat absorbance.

It states that when an electric current flows across two dissimilar conductors, the junction of the conductors will either absorb or emit heat depending on the flow of the electric current.

The heat absorbed or released at the junction is proportional to the input electric current. The constant of proportionality is called the Peltier coefficient.

Basic Principles:

When a p type semiconductor (doped with holes) is used instead, the holes move in a direction opposite the current flow. The heat is also transported in a direction opposite the current flow and in the direction of the holes. Essentially, the charge carriers dictate the direction of heat flow.
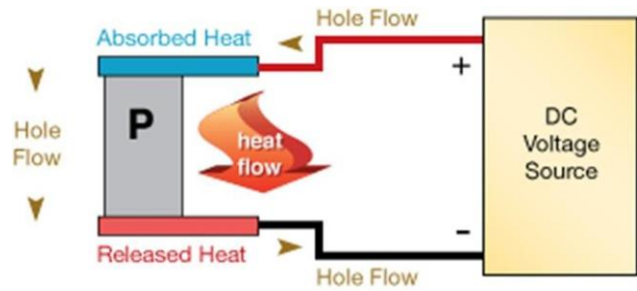
Circuit diagram:
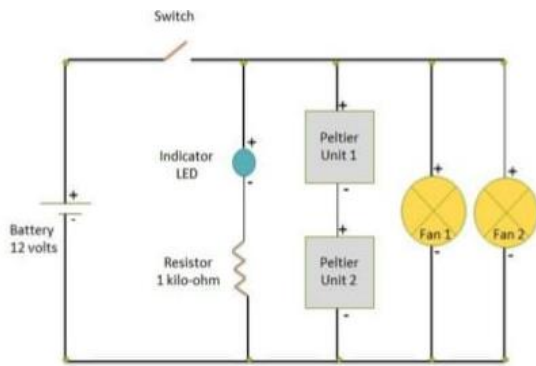
Fig. 20 Circuit Diagram

Major applications of electric cooler:

Include equipment used by military, medical, industrial, consumer, scientific/laboratory, and telecommunications organizations.

Uses range from simple food and beverage coolers for an afternoon picnic to extremely sophisticated temperature control systems in missiles and space vehicles.

Advantages of thermo electric cooling:

1. Small size and light weight.
2. Compact and reliable.
3. Steady-state operation.
4. No moving parts and fluids.
5. Durable and maintenance-free.
6. Very long operation life.
7. Effective in spot cooling.
8. Environmentally friendly.
9. No chlorofluorocarbons.
10. Ability to heat and cool.
11. Work in any orientation.
12. Generate no electrical noise
13. Can powered directly by PV cells

Future scope:

With recent development taking place in field of thermoelectric and nanoscience different thermoelectric material with high temperature difference to be explored this will further help to reduce the temperature, current below and can also perform better at higher ambient conditions. To improve the power retention in this thermoelectric Refrigerator sandwich heater needs to be explored with quick switching mechanism from thermoelectric c ell off state of heater to on state , so that temperature drop in thermoelectric cell can be reduced.

Working models photos:

Done by:

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Ch.Murali   : B151868

M.Aravind kumar   : B151923

15.BLUETOOTH GYRO/GRAVITY CONTROLLED SOLAR VEHICLE

Objective:

In this era of rapidly changing technological world, we have come up with a unique

Vehicle prototype that is versatile to its applications. Various challenges faced in vehicle parking, self

Accidents, pollution emission ,exploration, patrolling in cities are mainly dealt with this prototype.

Working principle:

A. Bluetooth controlled vehicle:

It has the BO gear motors which works on the principle of DC motor (Lorentz force) and controlled with the help of an android/IOS application REMOTE-XY which has two options Such as navigation and gyro/gravity button. We should select whatever wanted It has the user interface after connecting it to car via bluetooth, with the help of this user interface we can control the vehicle in any direction(fully controllable vehicle).On the other hand, the solar tracking system is automatically adjusted towards the high intensity of light with the help of LDR(Light Dependent Resistors) to charge low power batteries in vehicle.Obstacle detection are introduced in this prototype which is useful to prevent the accidents. We can also control by using with WiFi, IP module which ranges far distance. When any obstacle/vehicle comes in the direction of this vehicle ,it has a IR sensor it automatically detects and turns the vehicle backwards mostly used during parking.

B. Solar tracking:

It consists of 4 LDR's(LIGHT DEPENDENT RESISTORS) placed on Top, Bottom, Left, Right Consider it was ldr1, ldr2, ldr3, ldr4. When the sunlight falls with high intensity on the respective ldr Then that ldr's resistance is increased then the servo motor shift the solar panel towards that direction for each servo motor takes the 180 degree rotation. like this when the light falls vertical then the servo motor fitted on vertical position moves from top to bottom and servo motor fitted on the horizontal position moves from left to right. Then the maximum intensity of light absorbed and improve its efficiency. This improved efficiency is observed by gradual glowing of LED's.

MATERIALS DEFINATIONS AND THEIR SPECIFICATIONS:

 1.Arduino Uno:

        The Arduino Uno is a microcontroller board based on the ATmega328. It has 14 digital input/output pins (of which 6 can be used as PWM outputs), 6 analog inputs, a 16 MHz crystal oscillator, a USB connection, a power jack, an ICSP header, and a reset button. It contains everything needed to support the microcontroller; simply connect it to a computer with a USB cable or power it with a AC-to-DC adapter or battery to get started.
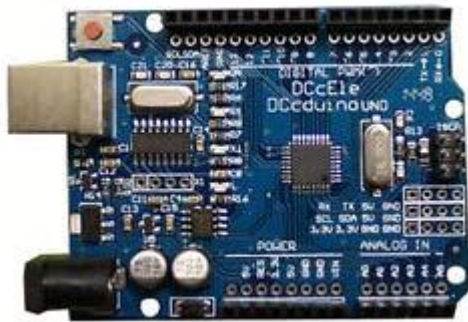
CURRENT CONSUMPTION OF THE ARDUINO UNO BOARD AT 9V

Arduino UNO Power and Voltage	
Part(s)	*Current (A)*
Arduino UNO	0.04
UNO and Wi-Fi camera	0.20 - 0.24
UNO and distance sensor	0.50
UNO, Wi-Fi camera, and distance sensor	0.65 - 0.70

2. Bluetooth HC 05 Module:

        The HC-05 module is a Bluetooth SPP (Serial Port Protocol) module, which means it communicates with the Arduino via the Serial Communication.

50
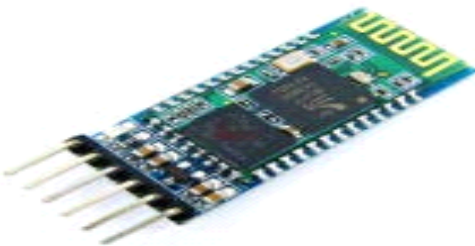
3. L298n Motor Driver Dual H Bridge:

      The L298N driver module , using ST's L298N chip can directly drive two 3-30V DC motor and provides a 5V output interface can 5V single chip circuitry to supply , support 3.3VMCU control, you can easily control the DC motor speed and direction.

4. IR sensors:

      Infrared obstacle avoidance sensor is designed to detect obstacles or the difference in reflective services. One application is to help a wheeled robot avoid obstacles with a sensor to react to adjustable distance setting.

S.No	Parameters	Range
1	Working voltage	DC 3.3 to 5v
2	Working current	≥ 20mA
3	Operating temperature	-10 °C - +50 °C
4	Detection distance	2 to 40cm
5	IO pins	5v Vcc, GND, Signal pin

5. Solar panel :

      It has photo diode which activates when photons of absorption of energy. Rating: 100mA,6V,dimensons: Rectangular shape(70mm x70mm x 03mm).

6. Servo motor :

      It is a motor which consists of gears which will adjusted to some angular position mostly it ranges from 0-180 degrees. It has three pins orange: It is signal pin, Red: It is supply 5v pin and brown: ground pin. Voltage ranges from Torque: 2.5kg/cm, Operating speed is 0.1s/60°,Weight of motor : 9gm .

BLOCK DIAGRAM:

    A. Block diagram of Bluetooth controlled vehicle:
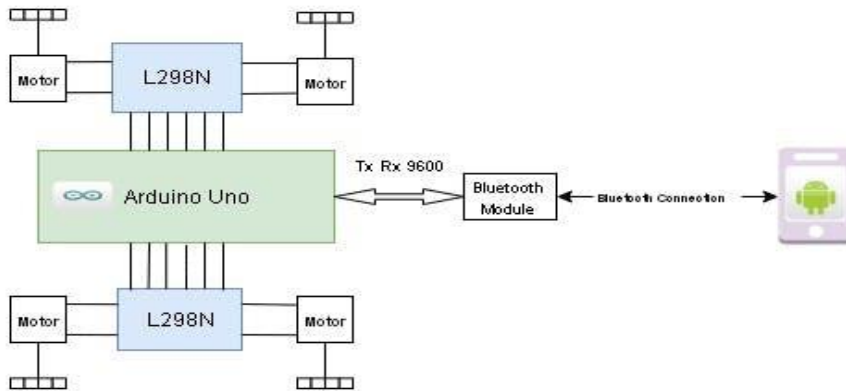
    B. Block diagram of automatic solar tracking:
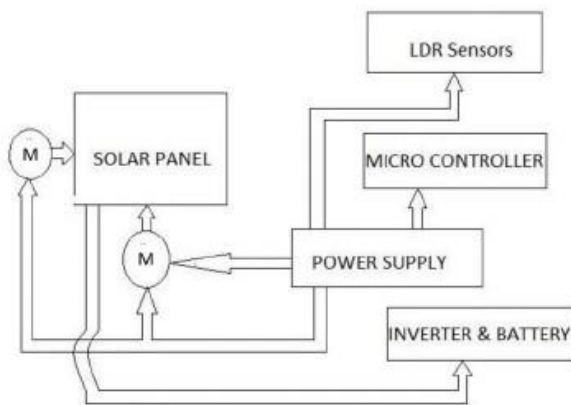
Circuit diagram:
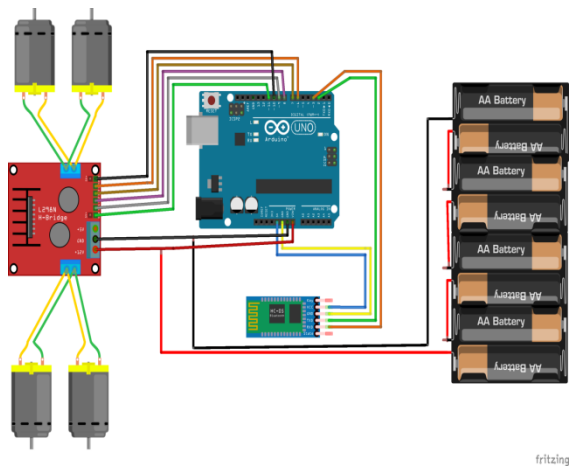
FEATURES:

• Human effort can be reduced.

• Time can be saved during parking.

• Improved efficiency of solar panel.

• Easy to operate and fully control.

• Easy to install and low cost.

APPLICATIONS:

• Bluetooth controlled driving and parking.

• Avoiding accidents subjected to self driving.

• Exploration of remote and danger prone areas.

• Uninterrupted surveillance in cities and power plants.

• Improved efficiency of solar tracking.

Working models photos:
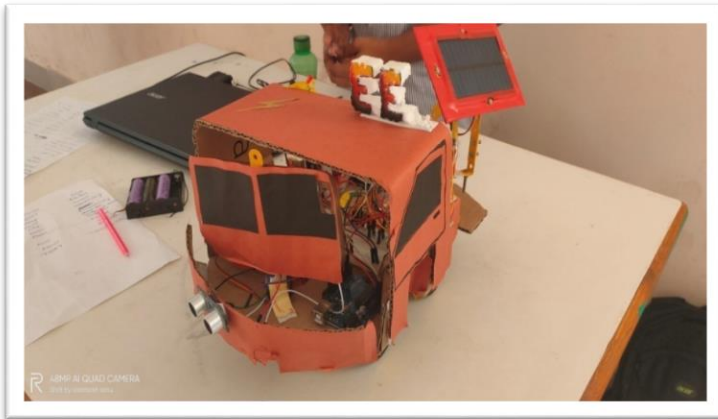
Done by:

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Mahendar Ellandula   : B151836

Balla Ranjith kumar   : B151978

Nakkaboina Tulasi Ram   : B151734

16. AUTUOMATIC POWER FACTOR CORRECTION

OBJECTIVE:

To improve the load power factor.

WORKING:

It works on the principle of "continuous monitoring of Load power factor and addition of REQUIRED CAPACITANCE ''.

OPERATION:

The system employs a CURRENT TRANSFORMER and POTENTIAL TRANSFORMER to sample load Current and Voltage respectively. The sampled Voltages and Currents and converted to SQUARE PULSES using a Comparator circuit. The square waveforms are given to an XOR gate. The output of XOR is given to ARDUINO to calculate POWER FACTOR and switches required amount of capacitance using RELAYs.

CIRCUIT DIAGRAM:

BLOCK DIAGRAM OF CIRCUIT
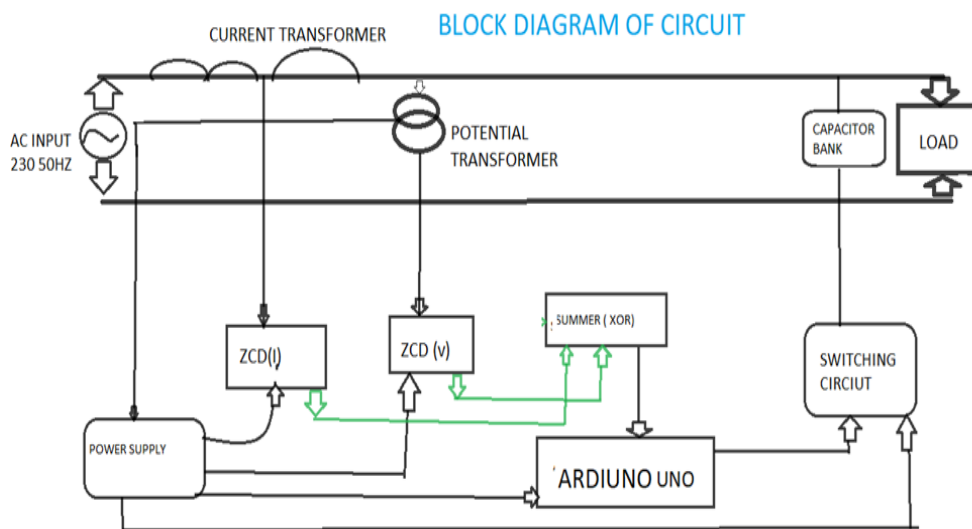
ADVANTAGES:

1. Accurate correction by preventing leading powerfactor.

2. Long service.

3. Continuous sense and monitoring load.

4. User-friendly.

FUTURE SCOPE:

It is envisaged to replace the switching circuit in the current system (i.e. relay circuit) with the controlled power electronics switches (SCR).

Usage of SCR makes system performance more accurate and effective with change in Voltage (firing angle).

WORKING MODELS PHOTOS:
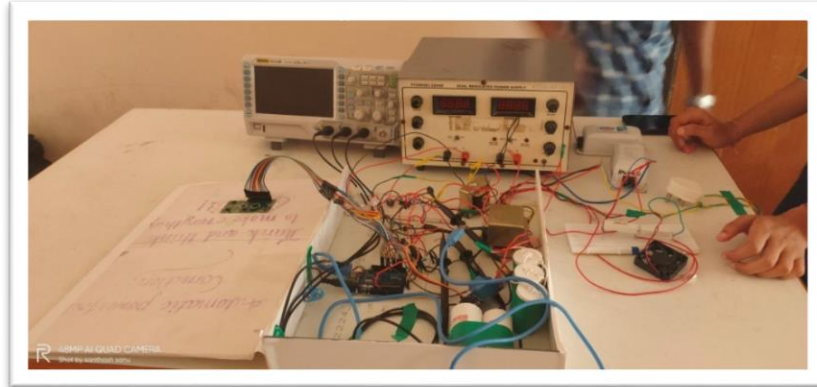
Done by:

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17.INDUSTRIAL PLANT AUTOMATION AND MONITORING SYSTEMS FROM REMOTE LOCATIONS

Objective:

To gather and analyze the real-time data to keep track, monitor and control the equipment in different types of industries from remote locations. This prototype discusses a model of an industrial system, which performs sequential operations using relays. The system shuts down automatically once it detects the set points. This model is implemented using an Arduino microcontroller as it proves to be the most viable alternative. Being an open source platform with the minimal cost it helps the prototype system with ease.

Working principle:

An industrial environment is created and sensors are kept near equipment which is to be monitored and automated. Here we have used the following sensors i.e. DHT11,SR-HC04,MQ3 respectively. Now we demonstrated a boiler in which the temperature sensor is placed in it likewise we used ultrasonic sensor near the machine and an alcohol sensor outside the control room. All the parameters like temperature, humidity alcohol and distance are monitored in the serial monitor. The sensors and relays and interface with each other with Arduino mega microcontroller.GSM 900A module is used for automation purpose. When the message is sent from the mobile from remote location the values will be declared as set values once the threshold temperature exceed the relay gets operated and shut downs the boiler. Likewise when some worker come near to the machine it gives warning further it turns the machine off. We also used alcohol sensor near the control room it triggers the servo motor which is kept as a door near the control room if the person who consumed alcohol enters the control room it doesn't allow him inside as the door is turned off. Thus all the sensors and relays are operated sequentially and triggers the relay when any faults are detected.

BLOCK DIAGRAM:
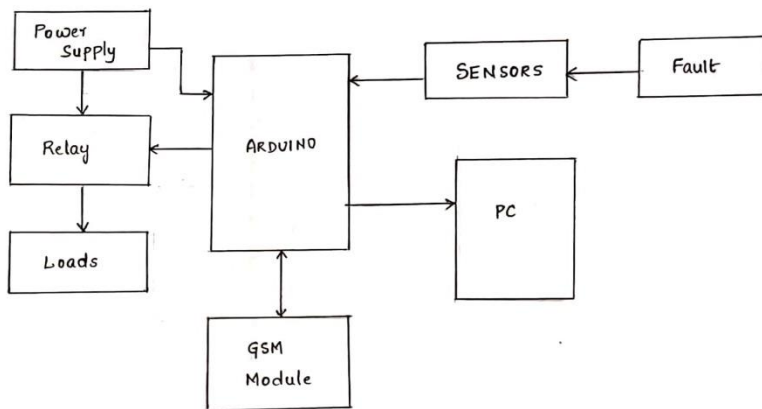
Features:

This system provides a good automation and monitoring for small and medium scale industries. It opens a window for controlling the industry from any place. It provides accurate monitoring system. It reduces the human effort. It improves the product quality, reduce the production cost and labor provides a high safety measures. It provides flexibility to the industry.

Applications:

1. This prototype provides a good window for automation in medium and small scale industries smoothly.
2. Using Arduino microcontroller can help in rectifying the errors and changing the parameters of the system.
3. It provides a good security and safety measures for the industry.
4. Avoids industrial damage.

Working models photos:
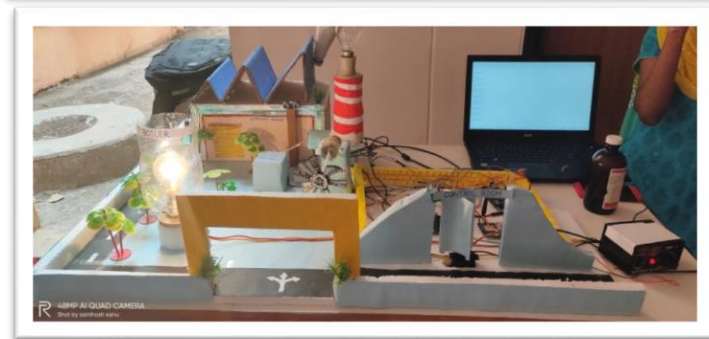
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POSTER PRESENTATIONS:

S.no	Name of the poster	Done by
1.	Prepaid energy meter	S.Kaveri - B161093 K.Ankitha - B161869
2.	Magnetic levitation	G. Sampath -B161190
3	Electromagnetic brakes	M.Kavya - B171311 B.Shravya - B171615
4.	Regenerative braking system	D.Nikitha - B171786 M.Sharanya -B171821
5	Space based solar power	B.Archana - B161912
6	Wireless power transmission	A.Anusha - B171430 D.Chithra - B171349
7	Piezoelectric effect	P.Sunitha - B161401 E.Rachana - B161406

PAPER PRESENTAIONS:

S.no	Name of the paper	Done by
1.	Graphene in Solar Technology	Sk. Taju –B161199 D.Rashmitha-B161157
2.	Gas insulated substation	S.Dharani –B161809
3.	Smart Grid	S.Supraja-B171453 B.Alekya-B171774

PHOTO GALLERY

GUEST TALK BY DR. NAVEEN KUMAR MARATI

GUEST TALK BY Mr.G.BHASKAR

INSPECTION: **Vice chancellor Sri A.Ashok IAS , visit to the department**

EVALUATION BY JURY:

ESCAPE ROOM:

WORKSHOP:

PUBLICITY:

SUCCESS MEET:

Acknowledgment:

We have been fortunate enough to be backed by a team of very motivated and dedicated faculties and lab staff who worked very hard equally with us. We are glad the efforts put in by everyone have barred us the fruits.

We extend our most sincere thanks to the entire RGUKT family for their incessant support, guidance for making Departmental fest as a part of ANTAHPRAGNYA 2020 a grand success.

We believe that this legacy would continue in the upcoming years and we double our efforts to make more wonders.

<p align="center">A heartful thanks to all.</p>

<p align="right">-Students of EEE</p>