

NEW ELECTRONIC PAPER DISPLAYS BRILLIANT COLOURS



Imagine sitting out in the sun, reading a digital screen as thin as paper, but seeing the same image quality as if we were indoors. A new type of reflective screen sometimes described as 'electronic paper' offers optimal colour display, while using ambient light to keep energy consumption to a minimum. The inversion of the design represents a great step forward. They placed the component which makes the material electrically conductive underneath the pixelated nanostructure that reproduces the colours instead of above it, as was previously the case. This new design means you look directly at the pixelated surface, therefore seeing the colours much more clearly. In addition to the minimal energy consumption, reflective screens have other advantages. For example, they are much less tiring for the eyes compared to looking at a regular screen. To make these reflective screens, certain rare metals are required such as the gold and platinum but because the final product is so thin, the amounts needed are very small. The possibility of actively controlling structural colours has recently attracted a lot of attention, in particular for new types of reflective displays (electronic paper). However, it has proven challenging to achieve good image quality in such devices, mainly because many subpixels are necessary and the semi-transparent counter electrodes lower the total reflectance. Here we present an inorganic electrochromic nanostructure based on tungsten trioxide, gold, and a thin platinum mirror. The platinum reflector provides a wide color range and makes it possible to "reverse" the device design so that electrolyte and counter electrode can be placed behind the nanostructures with respect to the viewer. Importantly, this makes it possible to maintain high reflectance regardless of how the electrochemical cell is constructed. We show that our nanostructures clearly outperform the latest commercial colour e-reader in terms of both colour range and brightness.

For more details: <https://pubs.acs.org/doi/abs/10.1021/acs.nanolett.1c00904>

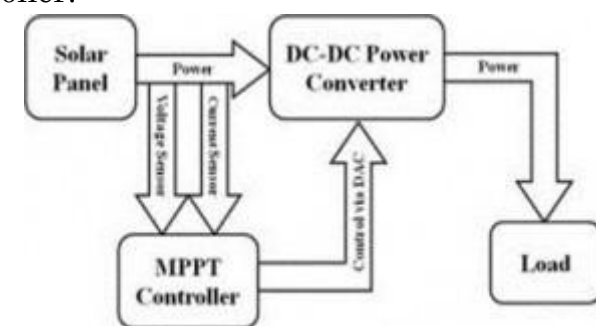
SMART GADGET Nolii Set Battery



According to London-based brand Nolii, this is the world's first modular plug and power bank system which is to say, it strips back the need for separate charging wires altogether. The silicone plug attaches magnetically to the power bank, which itself has a built in lightning cable (as well as a USB-A port for non-iPhone related emergencies.) It's a smart idea! How often have you picked up a power bank in a mad dash out of the door, only to find that it has run out of juice? Doesn't hurt that Nolii create some of the most tastefully design phone accessories in the game, too.

PHOTOVOLTAIC SOLAR POWER GENERATION WITH MAXIMUM POWER POINT TRACKING

This system considerably minimizes the number of panels required to generate the electric power so that it reduces the photovoltaic array system cost. As the sun is not constant in one place, and by fixing the solar array at one fixed place, maximum power generation is not possible. Therefore, this system locates the maximum power generating point with the MPPT controller.

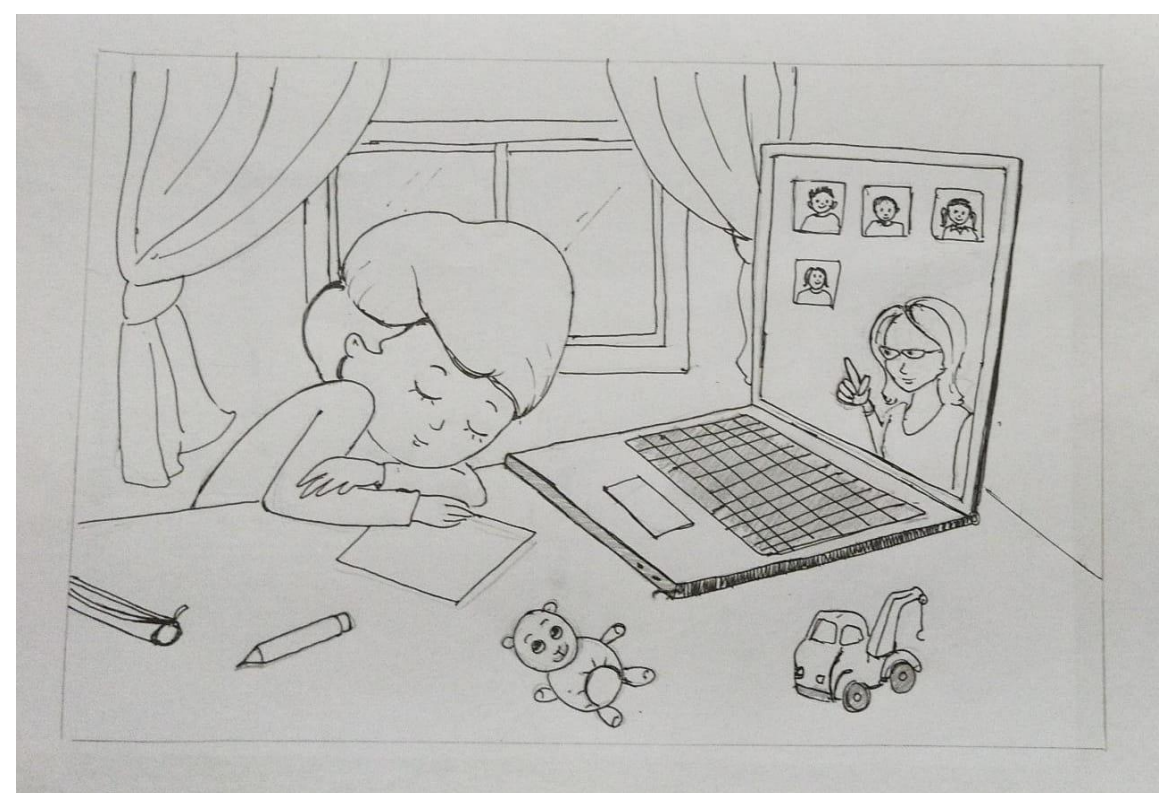


This system uses a quadratic equation based algorithm that calculates the quadratic function corresponding to the maximum PowerPoint. Program based software executes algorithm and correspondingly controls the DC converter to adjust the output voltage. A control strategy based on an improved INC technique was developed in order to regulate the power output of a solar system, which comprises photovoltaic generation, a boost DC-DC converter that is able to step-up the load voltage. The solar energy has many advantages compared with fossil fuel energy. It is inexhaustible, free of charge, naturalness, clean, no ecological pollution, and with modular character, which allows construction of the solar array at different power levels. On the other hand, it has an important disadvantage, which is the low efficiency of conversion of light to electrical energy. Moreover, the power harvested by a PV generator depends on a number of factors, such as the luminosity, the temperature, and the load in that it is connected. In each operating condition, there is just one and unique particular point that makes the PV array in functioning at its maximum power. In most PV applications (stand-alone system, hybrid system and public grid connected system), it is very important to exploit the peak power provided by the photovoltaic generator.

For more details:

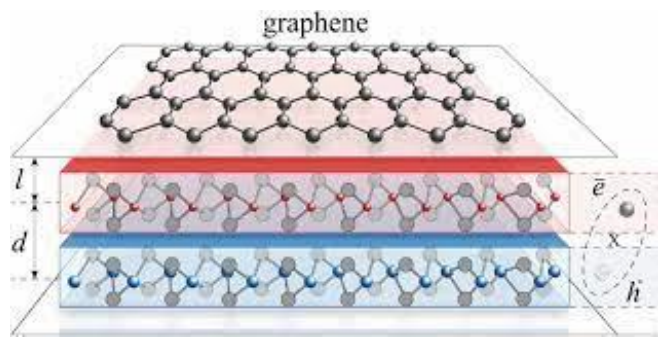
https://www.researchgate.net/publication/305830025_Photovoltaiic_maximum_power_point_tracking_under_fast_varying_of_solar_radiation

CARTOON CORNER



Harigovind, S2 ECE

NEW MECHANISM OF SUPERCONDUCTIVITY DISCOVERED IN GRAPHENE



Superconductivity is a physical phenomenon where the electrical resistance of a material drops to zero under a certain critical temperature. Bardeen-Cooper-Schrieffer (BCS) theory is a well-established explanation that describes superconductivity in most materials. It turns out that bogolon pair mediated interaction allows us to surpass the long standing problem of the vanishing density of states of particles with a linear spectrum. It states that Cooper pairs of electrons are formed in the lattice under sufficiently low temperature and that BCS superconductivity arises from their condensation. While graphene itself is an excellent conductor of electricity, it does not exhibit BCS superconductivity due to the suppression of electron phonon interactions. This is also the reason that most 'good' conductors such as gold and copper are 'bad' superconductors. A new mechanism of superconductivity in graphene, which arises due to interactions between electrons and "bogolons," rather than phonons as in typical BCS systems. Bogolons, or Bogoliubov quasiparticles, are excitation within BEC which has some characteristics of a particle. In certain ranges of parameters, this mechanism permits the critical temperature for superconductivity up to 70 Kelvin within graphene. The researchers also developed a new microscopic BCS theory which focuses specifically on the novel hybrid grapheme based system. Their proposed model also predicts that superconducting properties can be enhanced with temperature, resulting in the non-monotonous temperature dependence of the superconducting gap. This work sheds light on an alternative way to achieve high-temperature superconductivity. Meanwhile, by controlling the properties of a condensate, we can tune the superconductivity of graphene. By controlling the properties of the condensate, the superconductivity of graphene can be adjusted. This suggests another channel for controlling superconducting devices in the future

For more details : <https://iopscience.iop.org/article/10.1088/2053-1583/ac0b49>

ZIGBEE BASED SOLAR POWERED FOREST FIRE DETECTION AND CONTROL SYSTEM

This project is to detect and prevent the forest fire remotely by using Zigbee communication. The entire transmitter circuit is located in the forest with different sensors like smoke and fire detectors, which are powered with a solar panel system. The embedded circuitry in the transmitter circuit collects processes the data and sends the data to a remote PC through the Zigbee communication module. On the receiver side, a Zigbee-transceiver-based PC receives these signals and correspondingly alerts the fire engines and also actuates the fire protection equipment in the forest remotely. The two main modules present in the project are the Monitoring Area Module and the Forest Area Module. All these together are split into five sub-modules for step by step development and implementation. Those include Sensors' Module, Serial Communication Module using Zigbee, Optimized Solar Energy Harvester using Maximum Power Point Tracking (MPPT), PC-based Web Server and Mechanical Modelling. An advanced system for Forest Fire Detection was developed which overcomes the demerits of the Existing technologies of Forest Fire Detection. It can be ensured that the system developed can be implemented on a large scale due to its promising results. Mechanical modelling for accessible and inaccessible areas helps in the easy implementation of the Forest Area modules. The system can also be upgraded with low-power elements, higher versions of Zigbee and a novel, high-efficiency MPPT Algorithm in order to make the system run for longer periods with increased efficiency

<https://www.ijser.org/researchpaper/Forest-Fire-Detection-Using-Optimized-Solar-Powered-Zigbee-Wireless-Sensor-Networks.pdf>

ENERGY METER BILLING WITH LOAD CONTROL OVER GSM WITH USER PROGRAMMABLE NUMBER FEATURES



Now a day the electricity department hiring employees every month to take meter readings in every home, this is a very expensive and time consuming job. Thus, this system provides a convenient and efficient method to avoid this problem. This project is used to receive the monthly energy consumption from a remote area straight to an electrical department as well as to the consumers and also to control the loads through SMS using GSM technology. The electricity office can take the readings of consumers using GSM at their place. The desired number is auto saved on the microcontroller over a missed call. The main objective of the project is to develop a wireless based energy meter reading system. Also the loads can be controlled GSM using this project. The microcontroller takes the reading from the energy meter and displays the reading on the LCD. The reading of the energy meter is also sent to the control room by a message via GSM modem. The energy meter is interfaced to a microcontroller of 8051 family. The energy meter readings are also read by the microcontroller and displayed on an LCD Screen, this data is also sent via sms through a gsm modem interfaced to the microcontroller. The Gsm modem also has sms receiving capability. On receiving particular user request it sends required signal to the microcontroller in order to do counting for required operation. It can switch loads On/Off as desired. This power meter billing plus load control using GSM system could be installed within domestic and commercial building for power meter billing and load control. This system is less costly, more reliable and more efficient as compared to other systems. a time efficient, reliable, and accurate system analysis can be obtained which is indeed economical and user friendly.

For more details: <https://youtu.be/Su97JLExmHE>



Google's First Tweet was in binary.

Motorola produced the first handheld mobile phone

Over 90% if the world's currency is digital.

Every iPhone advertisement has the time set to 9:41.

The first television broadcast took place in 1925

The first alarm clock could only ring at one time.

Computer Security Day is celebrated on November 30th.

The first word to ever be auto corrected was "teh" for "the".

The first cell phone call was in New York City.

The Apple Lisa was the first commercial computer with a Graphical User Interface (GUI) and a mouse.

In 1956, 5 megabytes (5MB) of data weighed a ton

Over 6,000 new computer viruses are created and released every month. 90% of emails contain some form of malware!