

MAY 2022

TECHNICAL MAGAZINE

Department of Electronics & Telecommunication Engineering **Technical Magazine** (YASHOTECH-ELECTRONICS) 2021-22 [EVEN SEM]

YASHODA INSTITUTES, SATA



RTIFICIAL INTELLIGENCE & DATA SCIENCE COMPUTER SCIENCE & ENGINEERING

ELECTRICAL ENGINEERING **ELECTRONICS & TELECOMMUNICATION ENGINEERING** MECHANICAL ENGINEERING (B.Tech./M.Tech)

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INSTITUTE CODE: 6757 NAAC B+ ARCHITECTURE (B.Arch)6880

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Today's reader can be a tomorrow's leader !

President's Desk

i welcome you to YSPM's Yashoda Technical Campus, Satara, an Institution which inculcates true values while disseminating quality education for shaping the career of our students. All our institutes are approved by the concerned statutory bodies and fulfill all the norms and standards laid down by them. Our technical campus is located in a lush, green, pollution free, picturesque environment. Our institutes have well qualified, experienced and student caring faculty, well equipped laboratories, spacious lecture halls and tutorial rooms, well maintained rich library, e-library, Wi-Fi Campus, Computer with Internet Facility, and a play ground with sports facilities. We emphasize on overall personality development of our students. Our faculty pays attention to each students a platform to excel not only in academics but also in co-curricular and a multi disciplinary study culture. Amenities provided by our institutes include transport facility, hostel facility, reprographics facility, canteen, STD PCO, medical centre, sports centre etc.

We are committed to import value based quality education along with development of positive attitude, skills and abilities to apply knowledge in order to meet the challenges of future. I extend my best wishes for your bright and prosperous future.

> Prof. Dasharath Sagare Founder President YSPM - YSS, Satara



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OUTCOME-BASED EDUCATION (OBE)

OBE is a student-centric teaching and learning methodology in which the course delivery, assessment are planned to achieve stated objectives and outcomes. It focuses on measuring student performance i.e. outcomes at different levels. Some important aspects of the Outcome Based Education

1. Course is defined as a theory, practical or theory cum practical subject studiedin a semester. For Eg. Engineering Mathematics

2. Course Outcome (CO) Course outcomes are statements that describe significant and essential learning that learners have achieved, and can reliably demonstrate at the end of a course. Generally three or more course outcomes may be specified for each course based on its weightage.

3. Program is defined as the specialization or discipline of a Degree. It is the interconnected arrangement of courses, co-curricular and extracurricular activities to accomplish predetermined objectives leading to the awarding of a degree. For Example: B.E., Marine Engineering

4. Program Outcomes (POs) Program outcomes are narrower statements that describe what students are expected to be able to do by the time of graduation. POs are expected to be aligned closely with Graduate Attributes.

5. Program Educational Objectives (PEOs) The Program Educational Objectives of a program are the statements that describe the expected achievements of graduates in their career, and also in particular, what the graduates are expected to perform and achieve during the first few years after graduation.

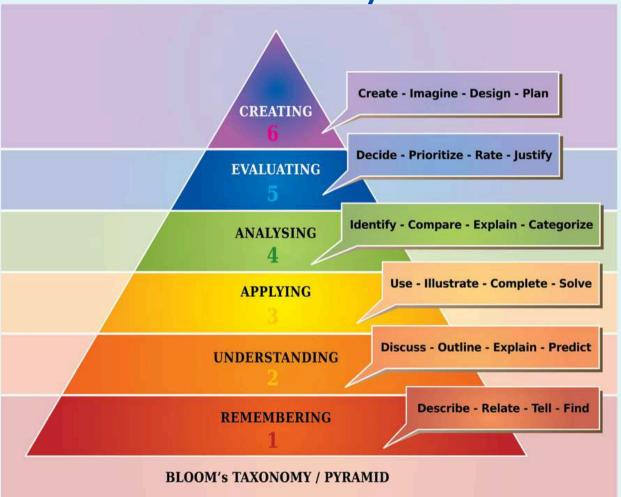




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Knowledge levels for assessment of Outcomes based on Blooms Taxonomy



TEJAL DNYANDEV DHAYGUDE, SY





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MEMS Technology Magic Means Micro

Micro-Electro-Mechanical Systems, or MEMS, is a technology that in its most general form can be defined as miniaturized mechanical and electro-mechanical elements that are made using the techniques of micro fabrication. The critical physical dimensions of MEMS devices can vary from well below one micron on the lower end of the dimensional spectrum, all the way to several millimeters. The term used to define MEMS varies in different parts of the the United States they world. In are predominantly called MEMS, while in some other parts of the world they are called "Microsystems Technology" or "Micro Machined Devices". While functional the elements of MEMS are miniaturized structures, sensors, actuators, and microelectronics, the most notable elements are the micro sensors and micro actuators. Micro sensors and micro actuators are appropriately categorized as "transducers", which are defined as devices that convert energy from one form to another. In the case of micro sensors, the device typically converts a measured mechanical signal into an electrical signal.



SNEHAL BABURAV BHADKE, SY

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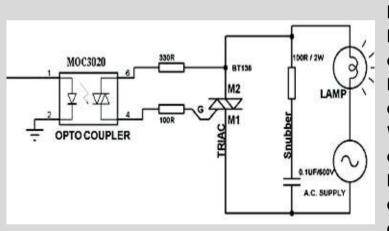


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When Signal Matters MOC3020 Opto-Coupler

Many electronic equipments these days are using opto-coupler in the circuit. An opto-coupler or opto-isolator allows two circuits to exchange signals yet remain electrically isolated. The standard opto-coupler circuit configuration utilizes an LED and a photo-transistor; usually it is an NPN transistor. Opto-couplers are also fabricated in few modules like SCRs, photodiodes, TRIACs and other semicon-ductor switches as an incandescent lamp or other light source. This article briefs about an opto-coupler MOC3020.



RAJE SAYALI TUKARAM, SY

To switch the AC current to the lamp, we have to use an opto-coupled TRIAC, lamp and a DIAC. A TRIAC is an AC controlled switch. It has three terminals M1, M2 and gate. A TRIAC, lamp load and a supply voltage are connected in series. When power is on, at positive cycle the current flows through lamp, resistors, DIAC, and gate and reaches the supply and the lamp glows for that half cycle directly through the M2 and M1 terminal of the TRIAC. In negative half cycle the process repeats. Thus the lamp glows in both the cycles in a controlled manner depending upon the triggering pulses at the opto isolator.



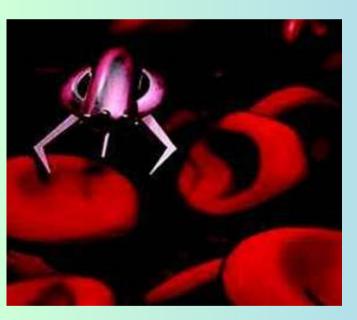


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Say Goodbye to Pills. Nano Robots Can Cure

Nano robots will be able to repair damaged or diseased tissues. The circulatory system is the natural path for these devices and the nano robots will pass through the blood stream to the area of defect. They attach themselves to specific cells, such as cancer cells and report the position and structure of these tissues. A creative methodology in the use of these devices to fight cancer involves using silicon nano machines with a thin coating of gold and light in the near infrared spectrum.



Light in the 700-1000 nanometer range will pass through the tissue and reaches the defec tive cell. When this infrared light strikes the particular type of nano robot, the device gets hot due to the oscillation of the metal's elec trons in response to the light. Using an MRI, the nano robot is specifically placed in the cancerous region, and then the light causes the devices to heat to 131 degrees Fahrenheit which destroys the cancerous cells but doesn't damage surrounding tissues. This is the new technology, without any draw-backs. These nano robots can cure any disease without affecting any other cells or tissues.

KENJALE ABHIRAJ DATTATRAY, TY





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Radio-Frequency Demystified

Radio-frequency identification (RFID) is the wireless use of electromagnetic fields to transfer data, for the purposes of automatically identifying and tracking tags attached to objects. The tags contain elec-tronically stored information.

Most RFID tags contain two parts.

- One is an integrated circuit for storing and processing information, modulating and de-modulating a radio frequency (RF) signal.
- The other is an antenna for receiving and transmitting the signal.
 There are generally two types of RFID tags:
- Active RFID tags, which contain a battery, and
- Passive RFID tags, which do not contain a battery.

RFID applications:

- In manufacturing and processing areas, RFID is used for inventory and production process monitoring and ware house order fulfilment.
- In supply chain management its uses include inventory tracking systems and logistics management.

TALEKAR AVINASH UCCHAPPA, TY





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No Defence Without Talon

TALON is a powerful, lightweight, versatile robot designed for missions ranging from reconnaissance to weapons delivery. Its large, quick release cargo bay accommodates a variety of sensor payloads. Built day/night and with all weather, amphibious capabilities standard TALON can operate under the most adverse conditions to overcome almost any terrain. The suitcase portable robot is controlled through a two-way RF/F/O line from a portable or Wearable Operator Control Unit (OCU) that provides continuous data and video feed-back for precise vehicle positioning. TALON payload and sensor include multiple cameras, a two stage arm, NBC sensors, radiation sensors, communication equipment. The TALON robot is used for bomb disposal. It is operated by radio frequency and equipped with four video cameras. The TALON began helping with military operations in Bos-nia in 2000. TALON robots had been used in about 20,000 missions in Iran and Iraq. Soldiers operate the swords by remote control from up to 1,000 meters away.



MANE MONALI NATHURAM, TY



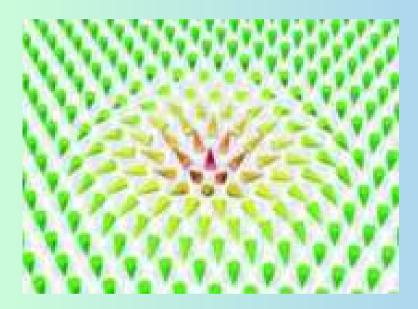


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"Skyrmions" For Data Storage

What Are Skyrmions? Skyrmions that consist of a small number of atoms were first identified about 80 years ago and have been the object of intensive research in recent years. They are named after a British particle Physicist, Tony Skyrme. This meant the existence or non existence of a skyrmion could be assigned the digital bit states "1" and "0", the basis for information technology.



KADAM YOGESH VIJAY, TY

n a Gist: In their experiment, the researchers used a two atomic layer thick film of palladium and iron on an iridium crystal. They observed the skyrmions, with a diameter of a few nanome-ters, with a scanning tunneling microscope. The skyrmions were then manipulated with a small spin polarized current from the tip of the micro-scope. The research team has demonstrated the feasibility of skyrmions in data storage. This new technology can also be introduced in computers, tablets and smart phones



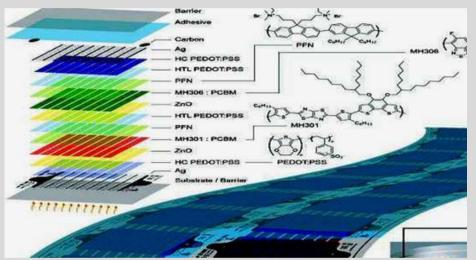


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Organic Solar Cell New Light on Sustainability

In an impressive feat of engineering, scientists in Denmark have devised a rapid, scalable and indus-trially viable way to manufacture large sheets of flexible organic tandem solar cells. Their successful application of roll-to-roll processing is a significant achievement for this emerging renewable technol-ogy. An Organic PhotoVoltaic(OPV) solar cell is a polymer-based thin film solar cell. OPV solar cells have been the focus of much research as they are lightweight, flexible, inexpensive, highly tuneable and potentially disposable. They are also unparalleled in the number of times that they can pay back the energy used in their manufacture.



RASAL POOJA PRAKASH, B.TECH

Frederik Krebs and his research team at the Technical University of Denmark are specialists in renew-able energy technologies, particularly OPVs. For the first time they have demonstrated the successful roll-to-roll manufacture of tandem OPV modules, each comprised of a stack of 14 discrete layers, which are rapidly printed, coated or deposited one on top of another by a machine reminiscent of a printing press. The experiment was carried out in simple conditions and is extremely fast, with a single solar cell module being printed onto blank foil each second.



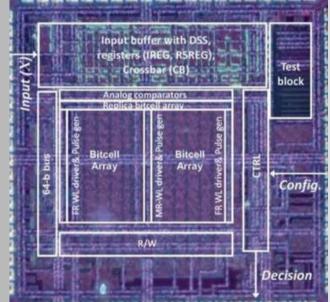


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Mixed Signals for Machine Learning

Multiple technological winters have stymied the development of machine learning. But now that smart speakers have invaded the home and Amazon has decided the time is ripe for a \$60 microwave that can take orders from Alexa, maybe AI-enabled systems are finally here to stay. The problem that continues to face embedded applications of AI is the cost of computation. Much of the work has to be performed using high-speed digital processors, often in the cloud because the battery will not sustain local processing. Developers are looking to methods to cut the energy bill. Processing in the analogue domain is one possibility. If you look at the gate count of a high-speed multiplier, a fundamental building block for most AI algorithms used today, it is easy to believe a simple analogue equivalent would be more energy efficient. At the SysML conference earlier this year, nVidia chief scientist Bill Dally talked of running SPICE simulations to work out whether analogue is a viable approach when it comes to performing machine learning. But he quickly saw problems emerge. One is the issue of matching analogue devices to the required level of accuracy though this is not the primary concern.



PAWAR SHIVANI VIVEK, B.TECH





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KHATAVKAR PRADNYA SHIRISH B.TECH





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Alumni Experience Hear it from the people who've been here and enjoyed the journey.

One of the most interesting stages in life that gives you an opportunity to explore is the 'college phase.' Life at college is the time when the teenage years end and we all dive deep into the ocean of new beginnings and possibilities. This golden period better equips you for all the challenges you'll face in life and creates a strong foundation of knowledge.

My experience at Yashoda Technical Campus, Satara has taught me one fundamental thing – life is unpredictable. It might be good, it might be bad, it might be weird, and it might not interest you, but expect anything to happen. For example, you might have a wonderful job this mo- ment, and be fired the very next moment. College life prepares you for all of this.

It is a perfect blend of joy and hardships. You meet different people, you interact with them, you learn about their cultures and grow as a person. You will understand how to talk to different people, how to judge their behavior, thus helping you with important life skills.

MULIK AVISHKAR SUNIL, B.TECH

