

Udoji Maratha Boarding Campus, Near Pumping Station, Gangapur Road, Nashik-13. <u>RSM POLY</u> Affiliated to MSBTE Mumbai, Approved by AICTE New Delhi, DTE Mumbai & Govt. of Maharashtra, Mumbai.

### **Newsletter Published Monthly**

Vol: II, Issue: 11

# **RSM POLY NEWSLETTER – DEC 2020**

### **ABOUT MVP SAMAJ**

The **Maratha Vidya Prasarak Samaj** is one of the most prestigious centers of learning in the State of Maharashtra. It manages 485 educational units and is one of the premier educational hub in the Nashik district.

At present, more than 2 lakhs of students are pursuing education. Over past 106 years, the institute has stood the test of time to become legend of unparalleled stature. History says that the credit for the birth of M.V.P. Samaj goes to the young, enthusiastic & devoted team of social workers and educationists who were inspired by the lives of Mahatma Jyotiba Phule, Savitribai Phule and Rajarshi Shahu Maharaj of Kolhapur. These young leading lights include Karmaveer Raosaheb Thorat, Bhausaheb Hire, Kakasaheb Wagh, Annasaheb Murkute, Ganpat Dada More, D. R. Bhonsale, Kirtiwanrao Nimbalkar and Vithoba Patil Khandalaskar, who laid the foundation of the Samaj. They were the men who envisioned the culture and knowledge centric society. The great visionaries of MVP Samaj rightly laid the "Well being and happiness of masses" as the motto for the Samaj.

### ABOUT RSM POLYTECHNIC

The **Rajarshi Shahu Maharaj Polytechnic** has been established in the year 2008, at the central place in Nashik. It is affiliated to MSBTE, Mumbai and approved by Government of Maharashtra, DTE Mumbai and the AICTE, New Delhi. The Polytechnic is in the process of Accreditation and Gradation. The Polytechnic has well-equipped and well-furnished laboratories, workshop and hostel facilities. Every department has separate computational facilities along with LAN, Wi-Fi and necessary software. At present the RSM Polytechnic provides three-year courses leading to Diploma in Engineering of MSBTE, Mumbai in the five disciplines: Mechanical Engineering, Computer Technology, Electronics and Telecommunication Engineering, Information Technology and Electrical Engineering.

# VISION AND MISSION

### VISION:

• To Empower the Common Masses by providing Quality Technical Education.

### **MISSION:**

- To create and implement innovative best practices to achieve academic excellence.
- To enhance the overall development of students by imparting essential skills.
- To inculcate principles of professional activities by promoting industry institute interaction and entrepreneurial skills.
  - To create an environment awareness for sustainable development.

Maratha Vidya Prasarak Samaj's Rajarshi Shahu Maharaj Polytechnic, Nashik



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# Admissions Open for First Year and Direct Second Year Diploma Engineering



\* उच्च शिक्षित व अनुभवी प्राध्यापक वर्ग \* सर्व प्रकारच्या शासकिय स्कॉलरशिप योजना लागू \* नाशिक शहराच्या मध्यवर्ती ठिकाणी शिष्टये : \* सुसज प्रयोगशाळा व सुसज ग्रंथालय \* कॅम्पस इंटरव्ह्यद्वारा नोकरी मिळविण्याची संधी.

### **MVP RSM Polytechnic FC**

 MVPS's RSM Polytechnic has authorised Facilitation Center for First Year and Direct Second Year Diploma Engineering Admission





FC takes all precautions to avoid spread of Covid-19 with social distancing guided by DTE.



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### **MVP RSM Polytechnic**

 Smriti Din of Adv. Vitthalrao Hande (16<sup>th</sup> Dec 2020)



'Smriti Din' of Karmyeer Adv.Vitthalrao Hande was celebrated in the institute by faculties and supporting staff members.

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Maratha Vidya Prasarak Samaj's Rajarshi Shahu Maharaj Polytechnic, Nashik



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### **NEWSLETTER: DEC 2020**

Mechanical Engineering Department			Computer Technology Department			
Sr#	Activities	Date(s)	Sr #	Activities	Date(s)	
1.	Guest Lecture on Product	5 <sup>th</sup> Dec 2020		-		
	Design Development					
2.	Webinar on Intellectual	7 <sup>th</sup> Dec 2020				
	Property Rights					
3.	Webinar on Opportunities	11 <sup>th</sup> Dec 2020			1	
	in HVAC & R for Youth	1411				
	5			シッシ		
		A CON	1/2			
Electronics & Telecomm Department			Information Technology Department			
		- 7.00	1.	Guest Lecture on Digital	4 <sup>th</sup> Dec 2020	
		-	2	Techniques &		
			2	Skill Development	5 <sup>th</sup> Dec 2020	
			2.	Program on Toner	5 Dec 2020	
			5	Refilling		
			3.	Skill Development	5 <sup>th</sup> Dec 2020	
			1.1	of Cartridge Ribbon of		
				Printer		
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	9500		1	<u> </u>	य 🔪	
Elect	etrical Engineering Department			Science and Humanity Department		
-		-	1.	FDP on Antenna:	7 <sup>th</sup> Dec 2020 to	
				Design & Analysis	12 <sup>th</sup> Dec 2020	
	DCI					
				UI		



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### Mechanical Engg. Department

 Conducted Guest Lecture on Product Design Development (5<sup>th</sup> Dec 2020)



Online Guest Lecture on Product Design Development was organized by Mechanical Engg. Dept. for Second Year and Third Year students. It was delivered by Mr. Mahesh Dharamkar, Section Manager, Product Engineering, John Deere India Pvt. Ltd, Pune. The event was coordinated by Dr. Hredeya Mishra.



The Webinar on Intellectual Property Rights was organized by Mechanical Engg. Dept. for Second Year and Third Year students. The event was organized by ISHRAE RSMP Student Chapter and coordinated by Prof. K. V. Kushare.

### **Conducted Webinar on Opportunities in** HVAC & R for Youth (11<sup>th</sup> Dec 2020) INDIAN SOCIETY OF HEATING, ISHRAE VOU **REFRIGERATING &** ISHRAE AIR CONDITIONING ENGINEERS ISHRAE NASHIK CHAPTER feels ISHRAE pleasure in inviting you for the CELEBRATION OF **"ISHRAE WEEK" Opportunities in HVAC&R for youth** By Mr. Sanjay Nikam Friday, 11th December 2020, From 11.00 AM to 12.00 PM, Please Join Meeting From Your Computer, Tablet or Smartphone Meet https://meet.google.com/jev-mhrk-yua For more details please go on link : https://www.facebook.com/ISHRAENasik/ ISHRAE Week Coordinators Mr. Vilas Ashteka 9860271584 Sonal Nikam Harshwardhan Ghongade

The Webinar on Opportunities in HVAC & R for Youth was organized by Mechanical Engg. Dept. for Second Year and Third Year students. The event was organized by ISHRAE RSMP Student Chapter and coordinated by Prof. K. V. Kushare.





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### **Information Technology Department**

 Conducted Guest Lecture on Digital Techniques & Microprocessor (4<sup>th</sup> Dec 2020)



Guest Lecture was organized on Digital Techniques & Microprocessor for Second Year students. It was delivered by Prof. Sujata Suryawanshi (Assistant Professor) MVPS's KBT COE, Nashik. It was Coordinated by Prof. R. S. More.

 Conducted Skill Development Program on Toner Refilling (5<sup>th</sup> Dec 2020)



Online Skill Development Program on Toner Refilling was organized for Second Year and Third Year Students. It was delivered and coordinated by Mrs. R. V. Shinde. Conducted Skill Development Program on Replacement of Cartridge Ribbon of Printer (5<sup>th</sup> Dec 2020)



Online Skill Development Program on Replacement of Cartridge Ribbon of Printer was organized for Second Year and Third Year Students. It was delivered and coordinated by Mrs. S. U. Shelke.

**Electrical Engineering Department** 



Online FDP on Antenna: Design & Analysis was attended by faculties of MVPS's RSM



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Polytechnic, Nashik. The event was Sponsored by AICTE-ISTE & organized by St. Xavier's Technical Institute, Mumbai and coordinated by Dr. Vijay R. Rathod.

### **Trending Technology:**

**Performance Prediction at Different Operating Conditions Of Centrifugal Pumps** 



Centrifugal pump is a most common pump used in industries, agriculture and domestic applications. Its impeller design demands a detailed understanding of the internal flow at rated and part load operating

conditions. For the cost-effective design of pumps it is very crucial to predict their performance in advance before manufacturing them, which requires understanding of the flow behavior in different parts of the pump. Experimental model testing is one of the solutions for prediction of performance but it is tedious, time consuming and costly. Conversely, theoretical approach merely gives a value; but it is unable to determine the root cause for the poor performance. In the recent years, CFD started to play a key role for the prediction of the flow through pumps and turbines having successfully contributed to the enhancement of their design

Normally, the CFD codes provide three calculation methods for the analysis of turbomachinery flows: the Multiple Reference Frame (MRF), the Mixing Plane and the Sliding Mesh. The first two methods are basically steady flow methods. In MRF method, the rotor is kept at a fixed position and the governing equations for rotor are solved in a rotating reference frame, including Coriolis and centrifugal forces, while for the stator are solved in an absolute reference frame.

#### **Performance** prediction

Centrifugal pumps are widely used in many applications, so the pump system may be required to operate over a wide flow range in different applications. The most previous numerical studies were focused on the design or near-design state of pumps. Few efforts were made to study the off-design performance of pumps, where the performance of pump deteriorates. With the aid of the CFD approach, the complex internal flows through the different components of pump can be studied at different operating conditions which help in improvement in the performance at off-design conditions.



b)

Fig.1: a) Three-dimensional computational model of centrifugal pump and (b) static pressure contours in the pump.

Mentzos simulated the flow through the impeller of centrifugal pump using finite-volume method along with a structured grid system for the solution of the discretized governing equations. The CFD technique was applied to predict the flow patterns, pressure distribution and head-capacity curve. It was reported that, although the grid size was not adequate to investigate the local boundary layer variables, global ones were well captured. The proposed approach was advocated for the basic understanding of the flow at various operating points.

#### Parametric study

CFD helps in prediction of flow behavior in different parts of the hydraulic machines before actually manufacturing them. In case of modification of existing systems, the modifications can be incorporated in numerical model and their effects can be predicted before implementing them. CFD analysis helps in studying the effects of various parameters, independently as well as by forming the nondimensional groups, on pump performance.

Bacharoudis analyzed the performance of pump by varying the outlet blade angles by keeping the same outlet diameter. The numerical simulation of 3-D, incompressible Navier-Stokes equations was carried out with a commercial CFD finite-volume code. At nominal capacity, when the outlet blade angle was increased from  $20^{\circ}$  to  $50^{\circ}$ , the head was increased by more than 6% but the hydraulic efficiency was reduced by 4.5%. However, at high flow rates, the increase of the outlet blade angle caused a significant improvement of the hydraulic efficiency.



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Patel and Ramakrishnan numerically studied the effects of changing hub curve profile and stator angle in mixed flow pump at duty point and at part load. The analysis concluded that: (i) the nature of head & power versus capacity curves obtained was similar to that of standard mixed flow pump (ii) pump efficiency was predicted within + 5% range at duty point. However, more variation was observed at off-design conditions and (iii) efficiency was improved by 1% after matching stator angle and changing hub curve profile. The efficiency versus capacity curves, actual and predicted by CFD analysis.

#### Investigations on interacting componenets

The relative movement between impeller and volute generates an unsteady interaction which affects not only the overall pump performance but is also responsible for pressure fluctuations. Pressure fluctuations interact with the volute casing and give rise to dynamic effects (mainly unsteady forces) over the mechanical parts, which are one of the most important sources of vibration and hydraulic noise.

### Prof. C. P. Gaikwad LME

#### **NASA's Robotic Glove**



Researchers at the NASA Johnson Space Center (JSC) in collaboration with General Motors (GM) have designed and developed Robo-Glove, a wearable human grasp assist device, to help reduce the grasping

force needed by an individual to operate tools for an extended time or when performing tasks having repetitive motion. Robo-Glove has the potential to help workers, such as construction workers, hazardous material workers, or assembly line operators, whose job requires continuous grasping and ungrasping motion. The Robo-Glove also has potential applications in prosthetic devices, rehabilitation aids, and people with impaired or limited arm and hand muscle strength.

### Benefits

- Wearable assist technology: a lightweight robotic glove that fits on your hand
- Small and compact design
- Human-safe robotics: pressure sensors give a sense of touch or haptic feedback
- Self-contained glove: actuators, pressure sensors, and synthetic tendons are embedded
- Ergonomic the system helps reduce muscle strain from repetitive motion tasks

### Applications

- Construction
- Hazardous material handling
- Medical
- Automotive Repair
- Manufacturing
- Repetitive motion work
- Oil and gas exploration

#### Advances in wearable technology for rehabilitation

Assessing the impact of rehabilitation interventions on the real life of individuals is a key element of the decision-making process required to choose a rehabilitation strategy. In the past, therapists and physicians inferred the effectiveness of a given rehabilitation approach from observations performed in a clinical setting and self-reports by patients. Recent developments in wearable technology have provided tools to complement the information gathered by rehabilitation personnel via patient's direct observation and via interviews and questionnaires. A new generation of wearable sensors and systems has emerged that allows clinicians to gather measures in the home and community settings that capture patients' activity level and exercise compliance, the effectiveness of pharmacological interventions, and the ability of patients to perform efficiently specific motor tasks. Available unobtrusive sensors allow clinical personnel to monitor patients' movement and physiological data



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such as heart rate, respiratory rate, and oxygen saturation.

### Miss. Vijayshri Dnyandev Shekokar Student, SYME

**Technology** is constantly updating at such a rapid pace



that it seems it is might be faster than light! A technology or a programming language that is making the rounds this week may be obsolete by the next few days! As more and more funds are

invested in research and development, computer scientists and professionals are constantly tweaking and improving existing technologies to get the most out of them.

As a result, a new programming language, library, patch, or plug-in gets released almost every hour. To keep up with this crazy pace of development, you have to keep learning the latest technology concepts. We will look at the most trending technologies that you must learn. Learn about the top hottest skills to learn to get a job.

### Latest Technology Trends of 2020

Learning and enhancing your skills are vital in this technological era. This helps you to prepare yourself for getting the highest paying jobs in the field of your choice. And if you are a professional already, learning new technologies and tools will take you an inch closer to the promotion you always dreamt of. Widening your arsenal of tools also enhances your value as a professional in your company. Here are some of the latest Here are some of the latest trending technologies that are sure to dominate the IT industry in 2020 and the upcoming years –

#### 1. Artificial Intelligence

Artificial intelligence (AI) is the technology used for equipping computer systems with the ability to make decisions like humans. Being one of the trending technologies, when AI programs are fed to systems, the aim is to mimic human intelligence for performing complex tasks such as pattern recognition, speech recognition, weather forecast and medical diagnosis.AI is used in navigation based applications like Uber, voice assistants like Siri, video streaming services like Netflix, IoT devices and in search engines like Google and Bing. AI helps in automating tasks such as traffic, scheduling trains, making business predictions and designing driverless cars! By 2030, AI automation is expected to create more than 70 million jobs. The sad fact is that AI might wipe out more than 23 million jobs by the same time frame. AI will create jobs in areas such as testing, support, maintenance, programming and data science. Software developers who know AI earn much more than developers who don't. So, learning AI will help you secure jobs such as -

A) Machine Learning Engineer

B) Data Scientist

C) Computer Vision Engineer

- D) Business Intelligence Developer
- E) Data Analyst

# Miss. Nikita Keshav Walke Student, SYCM

### Augmented Reality (AR)



Augmented reality (AR) technology adds digital elements onto a smartphone camera, creating an illusion that holographic content is a part of the physical world around you. In contrast with Virtual Reality (VR), you are not

immersed in the whole artificial environment. AR alters the surroundings a bit by adding 3D objects, sounds, videos, and graphics to it.

AR can be applied differently, so you can use it for making your face look like a cute kitten or find directions in shopping malls. Augmented reality allows you to virtually try on glasses or see how home appliances will look on your table. Such apps must differentiate between the physical and digital world to place virtual objects onto the right area. This is possible using computer vision algorithms that provide mobile apps with a high-level understanding of digital images or videos.

Globalization and the latest developments have made this AR accessible for the ordinary user. Mobile devices are the most available and best fit for AR mobile apps. You may opt for special AR devices like head-up displays or smart glasses.

To use AR all you need is your device's camera and an AR app. To use Google Play Services for AR, you need an Android device with a Google Account.



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#### HOW DOES AR WORKS?

To show the relevant content to the user AR uses computer vision, simultaneous localization, mapping and depth tracking (sensor data calculating the distance to the objects). This allows cameras to collect, send and process data in order to show digital content relevant to what the user is looking at. For instance, imagine that you are using AR navigation, like in the picture above. First, computer vision processes the location and objects captured by the camera and recognize it. Then, the program puts labels onto the surface. The process happens every time the user holds a phone camera in front of the location that has been previously mapped. This type of AR is marker less.

Another example is a soccer game. The app recognizes a person's foot, by setting virtual footprint on the actual foot and its motion, so the user could kick the virtual soccer ball down the alley on the screen and 'remember' the player's foot to keep scores for each session. Due to function of object recognition, the user's foot can be detected, allowing the program to identify each player and offer a new game for another user respectively.

#### WHY DOES AR NEED COMPUTER VISION?

For an augmented reality to start working cameras must see things be capable enough to figure out what they are seeing and further categorize it.

The whole process of computer seeing real world includes the machine representing colors by numbers, identifying a similar group of colors and then segmenting the image, searching for lines that meet at object angles and covering a specific part of the image, finding textures, and matching the image with those present in the database.

Augmented reality requires discerning objects around the user in terms of both semantics and 3D geometry. Semantics recognizes the object, while geometry figures out where the object is placed.

#### Mrs. V. K. Bhamare Computer Department

#### **Embedded Web Technology**



Embedded Web Technology (EWT) is regarded as the 'marriage' of Web technologies with embedded systems. In other words, the software developed for embedded systems is applied by making use of the Internet. Embedded

technology has been around for a long time and its use has gradually expanded into the PC market. Speed, accuracy, reliability were the reasons why embedded technology entered computers. With an great market size of billions in the next coming years, the future is embedded. Embedded systems contain processors, software, input sensors and output actuators, which work as the controls of a device and are subject to constraints. These Embedded systems may not have disk drives, keyboards, display devices and are typically restricted in terms of power, memory, GUIs and debugging interfaces. The central building blocks are microcontrollers, i.e. microprocessors integrated with memory units and specific peripherals for the observation and control of these embedded systems. On the other hand, Web technologies employ client-server models.

Web-enabled devices use the HTTP standard protocol to transmit Web pages from the embedded system to the Web browser, and to transmit HTML (Hyper Text Markup Languages) form the data from the browser back to the device. The devices require a network interface such as Ethernet, TCP/IP software, embedded Web server software, and the Web pages that make up devicespecific Graphic user interface. the The HTTP protocol engine takes the request from the Web browser and sends it on the TCP/IP. The HTTP protocol Engine parses the request and sends it to the embedded application for processing. After producing the results, the embedded application generates the HTML code and feeds it to the HTTP Engine, which sends it back to the client using TCP/IP.

Embedded Web Technology is an enabling, or platform, technology. This means that, it is relevant to a wide variety of applications, many of which have not yet been identified. We at NASA have promoted EWT through workshops, participation in shows, and one-to-one consultations with our partners.

The web browser displays the web page and also requests any additional resources from the embedded system. These resources may include images and an applet. When the applet gets sent to the browser, the browser starts up its Java TM Virtual Machine which starts up the applet. The applet establishes a connection back to the embedded system, utilizing a different TCP port form the one being used by Tempest, which is typically 80.

While the connection is being established, the applet also begins the user interface. Since Java TM supports multitasking, the applet should be designed so that the user interface screens run in a separate ask from the interface to the embedded system. This gives a smoother running interface and also makes it easier to recover from communication drops without locking the user out. By taking advantage of the CORBA®



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technology, more flexibility is added to the system. CORBA® provides an interface that is independent of the underlying hardware platform, operating system and implementing language. Future upgrades to the embedded system or the web browser will be easier to implement since the change will be transparent to the other end of the interface.

#### Prof. N. A. Gade LEJ

#### Li-Fi Technology



Li-Fi (short for light fidelity) is wireless communication technology which utilizes light to transmit data and position between devices. The term was first introduced by Harald

Haas during a 2011 TED Global talk in Edinburgh. In technical terms, Li-Fi is a light communication system that is capable of transmitting data at high speeds over the visible light, ultraviolet, and infrared spectrums. In its present state, only LED lamps can be used for the transmission of visible light. In terms of its end use, the technology is similar to Wi-Fi - the key technical difference being that Wi-Fi uses radio frequency to induce a voltage in an antenna to transmit data. Whereas, the modulation of light intensity is used to transmit data in Li-Fi. Li-Fi can theoretically transmit at speeds of up to 100 Gbit/s. Li-Fi's ability to safely function in areas otherwise susceptible to electromagnetic interference (e.g. aircraft cabins, hospitals, military) is an advantage. The technology is being developed by several organizations across the globe.

LiFi uses visible light as a medium for the transmission of data. As a type of VLC system, it requires two components: a photodiode and a light source. The photodiode acts as a transceiver that receives light signals and transmits them back. The light source transmits data using emitted light as the medium. In this case, light emitting diodes (LED) serve as the light source. They are outfitted with a chip that serves as the signal processing unit.

LED light bulbs are semiconductors. This means current supplied to the bulb can be modulated, which in turn, modulates the light they emit. This process occurs at extremely high speeds that are unperceivable to the human eye. Data is fed into the light bulb and sends the data at extremely high speeds to the photodiode. It converts the data received into a binary data stream perceivable by humans such as video and audio applications. Li-Fi is a mobile wireless technology that uses light rather than radio frequencies to transmit data. The technology is supported by a global ecosystem of companies driving the adoption of Li-Fi, the next generation of wireless that is ready for seamless integration into the 5G core.

To send data over light, LiFi systems require a strong, robust light source like LED bulbs. LEDs are different from halogen or filament bulbs as they do not need to warm up. As previously stated, they are semiconductors. They start up quickly and emit light according to the current passed through them.

Within the light, the intensity of the colors red, green, and blue (RGB) is finely modulated to embed data into the LED light. (Again, this process is undetectable to the naked eye.) This fine modulation of RGB can be better described as a form of code. Once the light is received by a photodiode, the light is demodulated. The information received is either relayed to a cloud server or transcribed by the receiver itself. Content is then displayed according to the code obtained.

#### Mast. Umair Ahmed Khan, Student TYEJ

#### Automation: The Future of Data Science



Practically any article you read about how automation will influence our future can be divided into one of two stories. The first is that it will lead to a superior future, as it always had since the industrial revolution. Obviously, a

few people will lose their jobs, yet as history appears, new openings will be made. Furthermore, not just new openings, however better jobs. The other story is that this time is extraordinary. The robots are ending up increasingly smart and fit. Also, the number of jobs and enterprises they'll crush will far surpass the number of occupations they make. Obviously, it's difficult to tell which of the two stories will turn into a reality. What we can tell is that these stories share comparative initiation: an ever-increasing number of parts of our jobs and lives are being automated.

Data scientists help organizations figure out how to extricate valuable insights from an ocean of data to help examine and streamline their companies based on the discoveries. Data scientists focus on analyzing data, asking information-driven questions and applying statistics and mathematics so as to discover important outcomes.

Data scientists have foundations in advanced math and statistics, advanced analytics and progressively in AI and ML. For organizations who are hoping to run an AI



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project, having a data scientist in the group is advantageous to benefit from their data, modify algorithms and say something regarding data-driven choices.

In any case, extracting data from big data sets can be costly. To actualize any kind of big data project, an organization must form a data infrastructure first. Consider it various pieces of innovation that can run every one of the tools a data scientist needs. The issue is that for a long time building such a framework resembled assembling a vehicle just from parts. Conceivable, yet you required individuals with exceptionally specific skills and it took a great deal of money and time. Luckily, this is evolving. What we have found in previous couple of years is the presence of platforms that automate this procedure. Take for instance different cloud-based platforms that make it a lot simpler to create and maintain big data infrastructures, from my very own group to others in the market like Amazon Web Services (AWS), Google, Microsoft, and Anaconda.

#### Mrs. M. B. Patil LIF

### Harmonics Cancellation in Distribution Systems by Using a Hybrid Power Filter



The hybrid filter is presented in this paper, the limitation of the active and the passive power filter is overcome by developing the hybrid power filter . In the hybrid power filter the resonant cell is combining with voltage source inverter and this

together combination is act as a hybrid power filter. and the rating of voltage source inverter can be increased with increased in dc-link voltage and hence the capability of harmonic mitigation can be increased with dc link voltage . The reactive power control and the improvement in power quality is also presented in this paper. the quality factor is responsible for selecting the frequency of tuning circuit. The MATLAB simulation design give the harmonic reduction in distribution grid or distribution system and in three-phase four-wire system, this system is most economical.

#### Introduction:

Current harmonics in distribution networks or in distribution grid or in the transition system represent the importance of the problem originated by current harmonics in terms of power quality reliability, and continuity of supply, steady state stability of the system mainly. Current harmonics or the voltage harmonic in distribution grids mostly arises due to use of nonlinear loads. such as personal computer Discharge lamps that is the mercury vapour lamp or the sodium vapour lamp generally used for the street lightning and power electronics based equipments semiconductor devices are the some frequent examples of nonlinear lo ads in residential, commercial, and industrial facilities. Currents harmonics also have a dominant effect on medium-voltage and Low Voltage networks due to the presence of loads such as furnaces, ovens and rectifiers .Three-phase loads generate positive or negative sequence current harmonics in the distribution grid . as a result of this there is generation of resonance condition voltage distortion, overheating of equipment, and increase in transmission and distribution losses, premature ageing of electrical equipment's, etc.

whereas the Single-phase loads load generate the zero sequence current harmonic ,generally the single phase load is connected between the phase and neutral conductors, and the 3rd, 9th, and 15th harmonic order. is generated in the neutral conductor. Harmonics with order of multiple of three is produced from the several single-phase nonlinear loads and are considered up in the neutral conductor, as a result of this the harmonic current in the neutral conductor is higher than in the phase conductor.



Figure 1: The block diagram of the shunt connected active power filter

These hybrid filters act as high impedance blocks to the third-harmonic current. This high impedance limits current, which is flowing through the neutral conductor but reduces the phase to neutral voltage. The Active power filter and hybrid power filters are based on power converters, sometimes particular transformer configurations is also used in the active power filter and hybrid power filter. Power converters allows the effective controlling of the filtering characteristic, making this active and hybrid filter very suitable to efficiently cancel out zero sequence current harmonics.



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This paper represents an interesting method for filtering current harmonics in three-phase four-wire networks or in distribution network or in distribution grid. The proposed filter that is hybrid filters based on a special topology and characterized by a particular connection of the single-phase inductors and capacitors ,without using any additional controlling device.. The resonant cells are designed to mitigate the 5th-, 7th-, 11th-, and 13th-order harmonics in addition with the mitigation of zero sequence component harmonics that is 3rd, 9th,and 15th current harmonics . me analyzed and evaluated by both Simulation in MATLAB and experiments.

### Prof. P. R. Gangurde LEE

### **Renewable Energy Resources**



True renewable energy sources are energy supplies that are refilled by natural processes at least as fast as we use them. All renewable energy comes, ultimately, from the sun. We can use the sun directly as in solar

heating systems or indirectly as in hydroelectric power, wind power, and power from biomass fuels. Renewable energy supplies can become exhausted if we use them faster than they become replenished: most of England's forests were cut down for fuel before the English started using coal. If used wisely, however, renewable energy supplies can last forever

#### Introduction:

There are other alternatives to our typical energy sources that are not renewable. Although these are "alternative energy" rather than "renewable energy", they use the energy we have more efficiently than older technologies. In doing this, they help us make our existing energy supplies last longer and give us more time before we run out of stored fossil and atomic fuels The use of renewable and alternative energy sources can save us money, assure that our grandchildren and great grandchildren will have enough energy, and free us from the uncertainties of depending on energy supplies outside the United StatesBiomass is second to hydropower as a leader in renewable energy production. Biomass has an existing capacity of over 7,000 MW. Biomass as a fuel consists of organic matter such as industrial waste, agricultural waste, wood, and bark. Biomass can be burned directly in specially designed power plants, or used to replace up to15% of coal as a fuel in ordinary power plants. Biomass burns cleaner than coal because it has less sulfur, which means less sulfur dioxide will be emitted into the atmosphere. Biomass can also be used indirectly, since it produces

methane gas as it decays or through a modern process called gasification. Methane can produce power by burning in a boiler to create steam to drive steam turbines or through internal combustion in gas turbines and reciprocating enginesSolar technologies use the sun's energy directly to generate energy for industrial processes, buildings, and transportation as well as electricity for general consumption in all three of these end-use sectors. Given the large size of the solar resource, these technologies are not constrained by feedstock requirements but rather by costs and "institutional" obstacles such as performance (e.g., intermittent operation), perceived risks, and siting issuesPhotovoltaic (PV) devices convert the energy contained in sunlight directly into electricityusing modules composed of multiple PV cells. Two broad categories of PV devices exist: flat-plate and concentrating. Concentrator systems uses lenses to focus radiation onto just a few, highly efficient PV cells and only use direct beam sunlight, while flat-plates utilize the whole of the incident solar radiation, including diffuse (scattered) and direct insolationWind technologies convert the energy of moving air masses at the earth's surface to rotating shaft power that can be directly used for mechanical energy needs e.g., milling or water pumping) or converted to electric power in a generator. Two major types of turbines exist and are defined based on the axis of blade rotation: horizontalaxis which currently dominate commercial markets and vertical-axis turbines. Wind energy has proven the most cost-competitive renewable electricity technology for the bulk power market to date; however, its use is also very well-suited to remote and distributed applications. Hybrid applications, in which a wind turbine is coupled with another renewable energy source (e.g., PV) and/or a conventional back-up unit (e.g., diesel generator), are attracting much interest in the remote power market. For example, the fishing village of Xcalac in Mexico uses a hybrid system composed of six 10 kW wind turbines, an 11.2 kW PV array, and a diesel backup generator to provide 100% of its power. As of 1994, there were over 1700 MW of installed wind turbines in the world, the majority of which are located in California in the U.S. Most of these are in the 50-150 kW size range and are providing power to the electric utilities in that state. Newer turbines being installed today for bulk power are closer to the 150-300 kW range, and systems in the future are expected to be much larger, reaching sizes over 500 kW.

> Ms. Tupe Neha Vinay SYEE



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### Vedic Mathematics



Vedic Mathematics is a collection of Techniques/Sutras to solve mathematical arithmetic in easy and faster way. It consists of 16 Sutras (Formulae) and 13 sub-sutras (Sub Formulae) which can be used for problems involved in

arithmetic, algebra, geometry, calculus, conics. Veda is a Sanskrit word which means 'Knowledge'.

Using regular mathematical steps, solving problems sometimes are complex and time consuming. But using Vedic Mathematics General Techniques (applicable to all sets of given data) and Specific Techniques (applicable to specific sets of given data), numerical calculations can be done very fast.



#### Father of Vedic Mathematics: -Bharati Krishna Tirthaji

Vedic Mathematics is a system of mathematics which was discovered by Indian mathematician **Jagadguru Shri Bharathi Krishna Tirthaji** in the period between A.D. 1911 and 1918 and published his findings in a Vedic Mathematics Book by Tirthaji Maharaj **Advantages of Vedic Mathematics** 

- Vedic Math is simpler yet more interesting than regular Math.
- Vedic Mathematics enriches knowledge and understanding of Mathematics, which shows clear links and continuity between different branches of Mathematics.
- Vedic Mathematics methods come as a boon for all competitive exams (such as Management, Banking, Engineering etc.) as mathematic problems can be solved with amazing accuracy and speed.

- Vedic Mathematics being a most natural way of working can be learnt and mastered with ease and in a very short time.
- Leads to improvement in mental ability, sharpness, creativity and intelligence.
- > Reduces dependence on calculators.
- Improve concentrations

### **Importance of Vedic Maths tricks**

- Time managing
- Easy to calculate Problems
- Calculations without errors
- It generates the interest of children towards mathematics and science
- Improves memory and boosts self confidence

### Vedic Maths Tricks

- Squaring of a number whose unit digit is 5.
- $\succ$  Multiply a number by 5.
- Subtraction from 1000, 10000, 100000.
- Multiplication of any 2-digit numbers (11 - 19)
- Dividing a large number by 5

### Prof. Varsha R. Patil LSH

#### The Rise of AI



Well, we all have dreamt about things that first seemed impossible, but yet came into existence due to continuous efforts and deliberate creation done by all humans. And one field which almost makes all those dreams possible is **Artificial Intelligence** better

known as AI. Artificial intelligence (AI) is truly a revolutionary field of computer science, set to become a core component of all modern software over the coming years and decades. This presents a threat but also an opportunity. AI will be deployed to augment both defensive and offensive cyber operations. Artificial Intelligence is one of the emerging technologies which try to simulate human reasoning in AI systems. **John McCarthy** invented the term Artificial Intelligence in the year 1950. This at first seemed impossible to make machine learn human languages and form of abstraction but that's the place where AI came into creation. Each and everything can be considered as evidence of AI if



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machine does things that humans normally do. Now talking about it further due to the enormous advantages of AI it has been accepted worldwide and now let's see some of its base advantages **Advantages of AI: -**

FITTEST BUT BE SURVIVAL OF THE SMARTEST'.

-Ms. Srushty Borkar Computer Department

- Reduction in Human Error
- Takes risks instead of Human
- > Available 24x7
- Daily Applications



Disadvantages of AI: -

- High Costs of Creation
- Lacking Out of Box Thinking
- Making Humans Lazy
- > No Emotions



More importantly it will lead to human unemployment. Rich business man would love to hire machines that are more precise and accurate which will leave us with a jobless society. One thing to be noticed is that great people like Stephen Hawking and Elon Musk have always doubted the very rise of AI. But there is a need to strongly emphasize on creating ethical codes and policies to ensure that the risks associated with AI are mitigated to the minimum. Because with the growing world it won't be like 'SURVIVAL OF THE





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Happy Indian Navy Day, World Soil Day, Vijay Diwas, National Mathematics Day, Farmer's Day And Merry Christmas to All Readers on the behalf of Principal, Faculty, Supporting Staff and Students.

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