

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.

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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 "Wellbeing 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.



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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 इंटरव्ह्युद्वारा नोकरी मिळविण्याची संधी.

MVP RSM Polytechnic FC

 MVPS's RSM Polytechnic has otherized 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

 Karmveer Hande Birth Anniversary (1st Oct 2020)



The Birth Anniversary of karmveer Adv.Vitthalrao Hande was celebrated in the institute by faculty and supporting staff members with social distancing.

 Birth Anniversary of Mahatma Gandhi (2nd Oct 2020)



The Birth Anniversary of Mahatma Gandhi was celebrated in the institute by faculty and supporting staff members with social distancing.

Clean Campus Campaign (1st Oct 2020)



Clean Campus Campaign was organized on occasion of birth anniversary of Mahatma Gandhi in RSM Polytechnic.

Yogdaan Din Celebration (7th Oct 2020)



The 'Yogdaan Din' was celebrated on punyatithi of MVP Samaj's former Sarchitnis Dr. Vasantrao Pawar in the institute by faculty and supporting staff members.

 Guest Lecture on Why Join ISHRAE (12th Oct 2020)



The Guest Lecture on Why Join ISHRAE was organized by MVPS's RSM



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Polytechnic for Third Year students. Mr. Ashfaque Kagdi (Secretary, ISHRAE Nashik Chapter) was delivered lecture.

 Guest Lecture on Start-Ups and Intellectual Property Awareness Program (14th Oct 2020)



The Guest Lecture on Start-Ups and Intellectual Property Awareness Program was organized by MVPS's RSM Polytechnic for Third Year students. Mr. Abhijit Bhand, Founder and CEO of Kanadlab Institute of intellectual Property and Research gave brief Information about IPR.

 Birth Anniversary of Dr. A. P. J. Abdul Kalam (15th Oct 2020)



The Birth Anniversary of Dr. A. P. J. Abdul Kalam was celebrated as 'Vachan Prerna Din' in the institute by faculty and

supporting staff members with social distancing.

 Webinar on National Education Policy 2020 (15th Oct 2020)



The webinar on National Education Policy 2020 was attended by Prof. V. R. Patil, Prof. P. V. Patil, Prof. D. B. Mogal, Prof. S. P. Jagtap, Prof. A. A. Mogal, Prof. S. V. Malode, Mrs. K. B. Holkar. It was organized by NITTR, Bhopal.

Guest Lecture on Introduction about
ISTE Chapter (23rd Oct 2020)



The Guest Lecture on Introduction about ISTE Chapter was organized by MVPS's RSM Polytechnic for staff and students. Prof. B. N. Shinde (Asst. Prof., MVPS's KBTCOE, Nashik), Co-ordinator ISTE chapter gave brief Information about ISTE.



rof. N.S. Mogare Subject Teacher

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

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Mechanical Engg. Department

Virtual Visit To Access Cadd, Nashik (14th Oct 2020)



Prof. B. S. Deshmukł

HOD

Dr. D. B. Uphade

PRINCIPAL

Virtual Visit To Access Cadd was organized by Mechanical Engg. Dept. for Faculty and students. Mr. Sumant Borade and Mr. Pratik Kshirsagar, (Access Cadd, Nashik) was conducted the virtual visit on Solid Modeling.

Online Guest Lecture on Solid Modeling (15th Oct 2020)



Online Guest Lecture on Solid Modeling was organized by Mechanical Engg. Dept. for Faculty and students. Mr. Sumant Borade and Mr. Pratik Kshirsagar, (Access Cadd, Nashik) was delivered lecture on Solid Modeling.



Online Workshop on Solid Modeling was organized by Mechanical Engg. Dept. for Faculty and students. Mr. Sumant Borade and Mr. Pratik Kshirsagar. (Access Cadd. Nashik) was conducted workshop on Solid Modeling.

Khande Navami (24th Oct 2020)



On occasion of Khande Navami. Department had worshiped all tools and instruments in presence of Hon. Sabhapati Manikrao Boratse, Principal Dr. D. B. Uphade and Faculty and Staff.



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Online Guest Lecture on Nuclear Power Plant (24th Oct 2020)



Online Guest Lecture on Nuclear Power Plant was organized by Mechanical Engg. Dept. for Faculty and Students. Prof. Sushant Aher had conducted lecture on Nuclear Power Plant.

Computer Engg. Department

 Online Guest Lecture on Latest trends in Web Development (9th Oct 2020)



Online Guest Lecture on Latest trends in Web Development was organized by Prof. P. D. Boraste, Computer Dept. for Faculty and Students. It was conducted by Ms.Mayura Bhokardole, Technical Head, Caliber Infotech, Nashik.

 Online Guest Lecture on Software Testing (13th Oct 2020)



Online Guest Lecture on Software Testing was organized by Prof. P. N. Patil, Computer Dept. for Faculty and Students. It was delivered by Mr. Sunil Joshi, Nashik.

 Online Guest Lecture on Object Oriented Programming (17th Oct 2020)





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Online Guest Lecture on Object Oriented Programming was organized by Prof. S. V. Sarode, Computer Dept. for Faculty and Students. It was delivered by Prof. Bhawana Ahire, Assi. Prof., MVPS's KBTCOE, Nashik. Patil and Prof. R. S. Derle were speakers for workshop.

Information Techology Department
Khande Navami (24th Oct 2020)

Khande Navami (24th Oct 2020)



On occasion of Khande Navami, Department had worshiped all tools and instruments in presence of Hon. Sabhapati Manikrao Boratse, Principal Dr. D. B. Uphade and Faculty and Staff



Computer Department had organized Online Workshop on Networking for Faculty and staff members of RSM Polytechnic. Prof. P. D. Boraste, Prof. S. V. Sarode, Prof. G. N. Handge, Prof. P. N.



On occasion of Khande Navami, Department had worshiped all tools and instruments in presence of Hon. Sabhapati Manikrao Boraste, Principal Dr. D. B. Uphade and Faculty and Staff

 Online Workshop on RedHat Linux OS (26th Oct 2020)



Information Technology Department had organized Online Workshop on Red Hat Linux OS for Third Year Students. This session was delivered by Mr. Mayur More,Technical Consultant, Techno Kraft. It was organized by Prof. V. K. Khedkar.



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Electrical Engineering Department



On occasion of Khande Navami, Department had worshiped all tools and instruments in presence of Hon. Sabhapati Manikrao Boraste, Principal Dr. D. B. Uphade and Faculty and Staff

E & TC Engineering Department

 Online Industrial Visit at MK Research, Nashik (23th Oct 2020)



Prof. S. A. Suryawanshi of E & TC Engineering Department organized an industrial visit for Third year students at MK Research, Nashik due to lockdown situation. Online Guest Lecture on IOT (24th Oct 2020)



Online Guest Lecture on IOT was organized by E & TC Engg. department for second year and third year students. It was conducted by Prof. Parag Achaliya.

Khande Navami (24th Oct 2020)



On the occasion of Khande Navami, Department had worshiped all tools and instruments in presence of Hon. Sabhapati Manikrao Boratse, Principal Dr. D. B. Uphade and Faculty and Staff.

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Webinar on Advanced Technologies in Electronics (26th Oct 2020)



E & TC Department had organized webinar on Advanced Technologies for Faculty and staff members of RSM Polytechnic. Prof. S. N. Shelke, Prof. P. G. Deshmukh, Prof. N. A. Gade and Prof. S. A. Suryawanshi were speakers for webinar.

Trending Technology:

Self-Locking System:



Material handling equipments are used for the movement and storage of material within a facility or at a site. Classification of material handling equipments is as follows.

- Transport Equipment.
- Positioning Equipment.
- Unit Load Formation Equipment.
- Storage Equipment.
- Identification and Control Equipment.

Various types of accidents are happens during handling and storing of materials, improper handling and storing of materials can cause costly injuries, by using proper material handling equipment's we can avoid accidents. The term Self Locking System plays vital role in safety of working.

For self locking system worm gears are used, but they hardly ever exceed 45% efficiency, when made self locking. Thus we can conclude that if worm gear drives

when used for lifting applications with self locking as the main objective for safety considerations the drives are extremely in-efficient; hence there is a requirement of special purpose drive that will provide better transmission efficiency in self locking condition.

Problem Statement:

The term self-locking as applied to gear systems denotes a drive which gives the input gear the freedom to rotate the output gear in either directions but the output gear locks with input when an outside torque attempts to rotate the output in either direction. This characteristic is often sought after by designers who want to be sure that the loads on the output side of the system cannot affect the position of the gears. Worm gears are one of the few gear systems that can be made self-locking, but at the expense of efficiency, they seldom exceed 45% efficiency, when made self-locking. Past research and experiences had indicated that when conventional method uses for load lifting application introduces following disadvantages

- ➢ It gives 45% efficiency
- Large horse power motor required
- Increases production cost
- Also required large space



Fig.:Conventional Method using Worm Gear Box

Thus we can conclude that the if worm gear drives when used for lifting applications with self-locking as the primary objective for safety considerations the drives are extremely in- efficient hence there is a need of special purpose drive that will provide better transmission efficiency in self-locking condition so as to reduce power consume by the device .i.e. lowering the running cost.

Methodology:



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A screw will be self-lock if and only if its efficiency η is below 50%. Therefore the lead angle must take very small values in between 1° to 3° which causes the efficiency to drop to below 50%. The self-locking of screw depends on the pitch angle and the friction angle of the threads. It is possible to self lock of worm when lead angle is less than friction angle. The screw and nut arrangement when used in the conventional form will lead to lower efficiency thus there

is a need of an un-conventional approach to arrangement of screws that will lead to improved efficiency of transmission.

Construction and Working of Lifter Mechanism:

The set-up is an innovation over the conventional Worm gear box arrangement .The Zero slip worm drive is simply constructed. Two threaded elements are meshed together. Each worm is wound in a different direction and has a different pitch angle. For proper mesh, the worm axes are not parallel, but slightly skewed .But by selecting proper, and different, pitch angles, the drive will exhibit either self-locking, or a combination of selflocking and deceleration locking characteristics, as desired and drive efficiency can range up to 90%

Proposed system will be designed by developing twin worm system in form of external threaded worm and internal threaded ring with view to develop a zero slip winch system to be operated using 12 Volt DC PMDC motor for loading lifting application. For application in machine tool work loading for a vertical machining center.

Working of Zero Slip Lifter Mechanism

The power supply to the motor which is routed to the poles either to rotate motor clockwise to raise the load or counter clockwise to lower the load. The 2-pole 2-way switch controls the direction whereas the push button controls the position.

The input from the motor is given to the input right hand threaded shaft via spur gear pair. The pinion of mounted on the motor shaft whereas the gear mounted on the RH worm shaft. The RH worm shaft is held in ball bearings 6004 and 6003 zz respectively. The motion of the RH worm shaft is imparted to the threaded internal ring which there by rotates the load drum via the ring gear cage.

Advantages and Application

Advantages

1. Zero slip lifter system offers high transmission efficiency close to 90 %

efficiency

- 2. Lower power consumption
- 3. Zero slip in size
- 4. Low weight
- 5. Low production cost
- 6. Deceleration locking possible.

Applications

- 1. Hoists and lifts
- 2. Cranes
- 3. Propulsion lifts
- 4. Power winches

Prof. N. S. Mogare LME

Conceptual Design of

Analysis and Flying Cars - Are they Real



The idea of flying car has been with us for almost a century. This concept was first acknowledged by Glenn Curtiss, who was the prime rival of Wright brothers. When, Wright brothers came up with an exquisite

idea of aircrafts, he knew that he had to bring something extraordinary that can surpass the creation of the Wright's planes. The only misery about his concept of roadable aircraft was this flying car started to hop instead of flying. This definitely disappointed him and he could never figure out what went wrong with his flying car.

History:

Things changed in March 26, 1936 when Autogiro Company of America AC-35 started working on this concept. James G. Ray the chief pilot of the AC-35 had flown the test drive of the car. Initially, the car had simple configurations but with developing time, it was converted into a complete roadable car. However, this car was a huge success by apparently it was never launched in the market.

How will flying cars work?

Flying Car Understanding the concept of flying cars has never been easy. Engineers often confer that it's a complex process that needs tons of expertise along with the right amount of research work too. Making the flying cars "roadable" is a new idea that has immerged in the market today. Roadable flying cars will be able to fly in the air and even run on roads. But, there are a plethora of flying cars that have reached the market till



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date such as the X-M2, M200X, and M400 developed and manufactured by a Canadian genius Paul Moller. These sky cars work with the help of petrol, diesel, kerosene and alcohol too as the essential component that makes this car functional is propane. The fuel efficiency that is brought by these cars can be compared to that of a medium sized normal car. The initial cost of these cars was about \$1 dollar but later it came down to \$60,000.



Current Developments of Flying Car

There is a lot that is happening in the present scenario to give flying car the true popularity that they deserve. Presently, a United States based Automobile Industry known as Marco Industries is working on the development of a flying car called the SkyRider X2R. The car has an interior design of a two seats sports car and the company has revealed that now it's working on the five seatsand seven seats version of this car. The entire navigation support that will be stipulated by this car is controlled by GPS satellites along with cellular services. This means that the driver have to just get into the car, and then switch on the power after that enter the phone number or address of the destination that they want to reach and finally take off, rest of the work is done by the flying car itself.

The idea here is to bring a completely automatic system which can be utilized by almost anyone. Even those who hardly know anything about driving a car of plane can drive it as well. This makes this a fully automated car that will help you to get to your destination in no time. However, there are a few output devices installed in the car that can be used to operate any type of command that the user wants to give to the car.

Advantages:

They run on minimal amount of fuel hence they are quite fuel efficient.

One will never have to deal with traffic jams when they fly on a flying car.

100% automated cars make them easy to use

Some cars involve wireless systems and fully fledged GPS satellite connection too.

Disadvantages:

These cars are way too costly than the usual cars. The mechanism that is used in the making of these cars is quite complex.

Future Developments of Flying Car:

The future has something enticing in store for us in terms of flying cars. This is because Ferrari has announced its very own flying car F430 that has even approved its plans from the Federal Aviation Administrations. Now. there are number of developments that are taking place in the model using the k-omega 3D technique. This has given birth to a turbulence model that allows the engineers to understand how they can structure the entire concept in a proper way. The real physical model of this car is yet to be accomplished, but the tedious research and hard work that has gone into the process of making this car indicate that soon Ferrari will deliver what he has promised to their loyal customers. For now, the anticipation level is quite high, because if Ferrari comes up with a successful model of this car then it would be the fifth manufacturer of flying cars.

> Mast. Saurabh Patil Student - TYME

Cognitive Computing:



Cognitivecomputing (CC)describes technologyplatforms that,broadly speaking are based on thescientificdisciplinesintelligence and signalprocessing.platformsencompass machine

learning, reasoning, natural language processing, speech recognition and vision (object recognition), humancomputer interaction, dialog and narrative generation, among other technologies. In general, the term cognitive computing has been used to refer to new hardware and/or software that mimics the functioning of the human brain and helps to improve human decisionmaking. In this sense, CC is a new type of computing with the goal of more accurate models of how the human brain/mind senses, reasons, and responds to stimulus. CC applications link data analysis and adaptive page displays (AUI) to adjust content for a particular type of audience. As such, CC hardware and applications strive to be more affective and more influential by design.

Features:

1. Adaptive



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They may learn as information changes, and as goals and requirements evolve. They may resolve ambiguity and tolerate unpredictability. They may be engineered to feed on dynamic data in real time, or near real time.

2. Interactive

They may interact easily with users so that those users can define their needs comfortably. They may also interact with other processors, devices, and cloud services, as well as with people.

3. Iterative and stateful

They may aid in defining a problem by asking questions or finding additional source input if a problem statement is ambiguous or incomplete. They may "remember" previous interactions in a process and return information that is suitable for the specific application at that point in time.

4. Contextual

They may understand, identify, and extract contextual elements such as meaning, syntax, time, location, appropriate domain, regulations, user's profile, process, task and goal. They may draw on multiple sources of information, including both structured and unstructured digital information, as well as sensory inputs (visual, gestural, auditory, or sensor-provided. **Applications:**

1. Chatbots

Chatbots are programs that can simulate a understanding human conversation by the communication in a contextual sense. To make this possible a machine learning technique called natural language processing is used. Natural language processing allows programs to take inputs from humans (voice or text), analyze it and then provide logical answers. Cognitive computing enables chatbots to have a certain level of intelligence in communication.

2. Sentiment analysis

Sentiment analysis is the science of understanding emotions conveyed in a communication. While it easy for humans to understand tone, intent etc. in a conversation, it is far more complicated for machines. To enable machines to understand human communication you need to feed training data of human conversations and then analyze the accuracy of the analysis. Sentiment analysis is popularly used to analyze social media communications like tweets, comments, reviews, complaints etc.

3. Face detection

Face detection is the advanced level of image analysis. A cognitive system uses data like structure, contours, eye color etc. of the face to differentiate it from others. Once a facial image is generated, it can be used to identify the face from an image or video.While traditionally it used to be done using 2D images now it can also be done using 3D sensors which account for greater accuracy. This can be used in security systems like for a locker or even mobile phone.

4. Risk assessment

Management in financial services involves the analyst going through market trends, historical data etc. to predict the uncertainty involved in an investment. But this is analysis is not only related to data but also on trends, gut feel, behavior analytics etc. Thus it is both an art and a science. Big data analysis is not sufficient to do a risk assessment. Due to the intuition and experience involved in predicting market future, it is necessary to make algorithms intelligent. Cognitive computing helps combine behavioral data and market trends to generate insights. Experienced analysts for further analysis and predictions can then evaluate these.

5. Fraud detection

Fraud detection is another application of cognitive computing in finance. It is basically a type of anomaly detection. The goal of fraud detection is to identify transactions that don't seem to be normal (anomalies). This also requires programs to analyze past data to understand the parameters to be used for judging a transaction. A range of data analysis techniques like Logistic regression, Decision tree, Random Forest, Clustering etc. can be used to detect anomalies.

Miss. Vaishnavi Chaudhari Student - TYCM



MongoDB is an open-source database that uses a document-oriented data model and a non-structured query language. It is one of the most powerful NoSQLsystems and databases around today.

Being a NoSQL tool means that it does

not use the usual rows and columns that you so much associate with the relational database management. Architecture is built on collections and documents. The



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basic unit of data in this database consists of a set of key-value pairs.It allows documents to have different fields and structures. This database uses a document storage format called BSON which is a binary style of JSON documents. The data model that MongoDB follows is a highly elastic one that lets you combine and store data of multivariate types without having to compromise on the powerful indexing options, data access, and validation rules. There is no downtime when you want to dynamically modify the schemas. What it means that you can concentrate more on making your data work harder rather than spending more time on preparing the data for the database.

What makes it different from RDBMS?

You can directly compare the MongoDB NoSQL with the RDBMS and map the varied terminologies in the two systems: The RDBMS table is a MongoDB collection, the column is a field, the tuple/row is a document, and the table join is an embedded document. The typical schema of a relational database shows the number of tables and the relationship between the tables, but MongoDB does not follow the concept of relationship.

MongoDB is preferred over RDBMS in the following scenarios:

Big Data: If you have huge amount of data to be stored in tables, think of MongoDB before RDBMS databases. MongoDB has built in solution for partitioning and sharding your database.

Unstable Schema: Adding a new column in RDBMS is hard whereas MongoDB is schema-less. Adding a new field, does not effect old documents and will be very easy.

Distributed data Since multiple copies of data are stored across different servers, recovery of data is instant and safe even if there is a hardware failure.

Important Features of MongoDB

Queries: It supports ad-hoc queries and documentbased queries.

Index Support: Any field in the document can be indexed.

Replication: It supports Master–Slave replication. MongoDB uses native application to maintain multiple copies of data. Preventing database downtime is one of the replica set's features as it has self-healing shard.

Multiple Servers: The database can run over multiple servers. Data is duplicated to foolproof the system in the case of hardware failure.

Auto-sharding: This process distributes data across

multiple physical partitions called shards. Due to

sharding, MongoDB has an automatic load balancing feature.

MapReduce: It supports MapReduce and flexible aggregation tools.

Failure Handling: In MongoDB, it's easy to cope with cases of failures. Huge numbers of replicas give out increased protection and data availability against database downtime like rack failures, multiple machine failures, and data center failures, or even network partitions.

GridFS: Without complicating your stack, any sizes of files can be stored. GridFS feature divides files into smaller parts and stores them as separate documents.

Schema-less Database: It is a schema-less database written in C++.

Document-oriented Storage: It uses BSON format which is a JSON-like format.

Procedures: MongoDB JavaScript works well as the database uses the language instead of procedures.

Where to Use MongoDB?

- **Big** Data •
- **Content** Management and Delivery
- Mobile and Social Infrastructure
- User Data Management
- Data Hub

Language Support by MongoDB:

MongoDB currently provides official driver support for all popular programming languages like C, C++, C#, Java, Node.js, Perl, PHP, Python, Ruby, Scala, Go and Erlang.

> Prof. P. D. Boraste. **HOD, Computer Department**

5G Technology:



successor

to

In telecommunications, 5G is the fifth generation technology standard for cellular networks, which cellular phone companies began deploying worldwide in 2019, and the planned the 4G networks. which provide connectivity to most current cell phones. Like its predecessors, 5G networks are cellular networks, in



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which the service area is divided into small geographical areas called cells. All 5G wireless devices in a cell are connected to the Internet and telephone network by radio waves through a local antenna in the cell. The main advantage of the new networks is that they will greater bandwidth, have giving higher download speeds, eventually up to 10 gigabits per second (Gbit/s).Due to the increased bandwidth, it is expected that the new networks will not just serve cell phones like existing cellular networks, but also be used as general internet service providers for laptops and desktop computers, competing with existing ISPs such as cable internet, and also will make possible new applications in internet of things (IOT) and machine to machine areas. Current 4G cell phones will not be able to use the new networks, which will require new 5G enabled wireless devices.

Speed

5G speeds will range from ~50 Mbit/s to over a gigabit/s. The fastest 5G is known as mm Wave. As of July 3, 2019, mm Wave had a top speed of 1.8 Gbit/s on AT&T's 5G network.Sub-6 GHz 5G (mid-band 5G), by far the most common, will usually deliver between 100 and 400 Mbit/s, but will have a much farther reach than mm Wave, Especially outdoors. Low-band spectrum offers the farthest area coverage but is slower than the others.5G NR speed in sub-6 GHz bands can be slightly higher than the 4G with a similar amount of spectrum and antennas, although some 3GPP 5G networks will be slower than some advanced 4G networks, such as T-Mobile's LTE/LAA network, which achieves 500+ Mbit/s in Manhattan and Chicago. The 5G specification allows LAA (License Assisted Access) as well, but LAA in 5G has not yet been demonstrated. Adding LAA to an existing 4G configuration can add hundreds of megabits per second to the speed, but this is an extension of 4G, not a new part of the 5G standard.

Automobiles-5G Application-: Automotive Association has been promoting the C-V2X communication technology that will first be deployed in 4G. It provides for communication between vehicles and communication between vehicles and infrastructures.

Public safety-Mission-critical push-to-talk (MCPTT) and mission-critical video and data are expected to be furthered in 5G.

Fixed- Wireless Fixed wireless connections will offer alternative to fixed line broadband an (ADSL, VDSL, Fiber optic, and DOCSIS connections) in some locations.

> Mr. Suryawanshi.S.A. LEJ

Virtual Reality



reality (VR) Virtual is a simulated experience that can be similar to or completely different from the real world. Applications of virtual reality can include entertainment (i.e. video games) and educational purposes (i.e. medical or military training). Other,

VR style technology distinct types of include augmented reality and mixed reality, sometimes referred to as extended reality or XR. Currently standard virtual reality systems use either virtual reality headsets or multi-projected environments to generate realistic images, sounds and other sensations that simulate a user's physical presence in a virtual environment. A person using virtual reality equipment is able to look around the artificial world, move around in it, and interact with virtual features or items. The effect is commonly created by VR headsets consisting of a head-mounted display with a small screen in front of the eyes, but can also be created through specially designed rooms with multiple large screens. Virtual reality typically incorporates auditory and video feedback, but may also allow other types of sensory and force feedback through haptic technology.

History

The exact origins of virtual reality are disputed, partly because of how difficult it has been to formulate a definition for the concept of an alternative existence.^[5] The development of perspective in Renaissance Europe created convincing depictions of spaces that did not exist, in what has been referred to as the "multiplying of artificial worlds". Other elements of virtual reality appeared as early as the 1860s. Antonin Artaud took the view that illusion was not distinct from reality, advocating that spectators at a play should suspend disbelief and regard the drama on stage as reality. The first references to the more modern concept of virtual reality came from science fiction.



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Application

- 1. In Military.
- 2. In Sport.
- 3. In Mental Health.
- 4. In Medical Training.
- 5. In Education.
- 6. In Fashion.



Mast. Aditya Jagtap Student TYEJ

Blockchain, originally block chain, is a growing list of



records, called blocks that are linked using cryptography. By design, a blockchain is resistant to modification of the data. It is "an open, distributed ledger that can record transactions between two parties efficiently and in a verifiable and permanent way.

Blockchain, sometimes referred to as Distributed Ledger Technology (DLT), makes the history of any digital asset unalterable and transparent through the use of decentralization and cryptographic hashing.

Blockchain, which began to emerge as a realworld tech option in 2016 and 2017, is poised to change IT in much the same way open-source software did a quarter century ago. And in the same way Linux took more than a decade to become a cornerstone in modern application development, Blockchain will likely take years to become a lower cost, more efficient way to share information and data between open and private business networks. A blockchain is, in the simplest of terms, a time-stamped series of immutable records of data that is managed by a cluster of computers not owned by any single entity. Each of these blocks of data (i.e. block) is secured and bound to each other using cryptographic principles (i.e. chain).

A simple analogy for understanding blockchain technology is a Google Doc. When we create a document and share it with a group of people, the document is distributed instead of copied or transferred. This creates a decentralized distribution chain that gives everyone access to the document at the same time. No one is locked out awaiting changes from another party, while all modifications to the doc are being recorded in real-time, making changes completely transparent.

Components and Working:

Blockchain is an especially promising and revolutionary technology because it helps reduce risk, stamps out fraud and brings transparency in a scale able way for myriad uses. Blockchain consists of three important concepts:

Conclusion

Several industries are involving and implementing blockchain, and as the use of blockchain technology increases, so too does the demand for skilled professionals. In that regard, we are already behind. According to Techcrunch.com, blockchain-related jobs are the second-fastest growing category of jobs, with 14 job openings for every one blockchain developer. A blockchain developer specializes in developing and implementing architecture and solutions using blockchain technology. The average yearly salary of a blockchain developer is \$130,000. If you are intrigued by Blockchain and its applications and want to make your career in this fast-growing industry, then this is the right time to learn Blockchain and gear up for an exciting future.

Prof. Vishwas Khedkar HoD - IF Dept.

Advanced Cyber Car jacking :



Today we are living in cyber era, which gives rise to new technologies everyday and each of this technology is vulnerable in many ways...the only need is to exploit it which introduces term 'Hacking', it can be ethical or

unethical. In majority of house's there is at least a two-wheeler or four- wheeler(car). Nowadays people are not using keys to open or close the doors of car, but uses key fob which automates the activity of closing and opening doors physically.

Disadvantage of this technology is taken by some cyber criminals in the society, which allows them to commit cyber-crime which is named as "Advance Cyber Car Jacking" in cyber terms.

Do you know how secure is key fob?? The car is locked or unlocked via Key fob's radio frequency. Do you know the advantages and disadvantages of this?

1. Blocks



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Let's talk about it today. A unique frequency for each Key fob is set by the car provider. Whenever you press the button on the key fob, radio signals are transmitted from the key fob. That radio frequency signal is received by the receiver in your car. If frequency of these signals are matched, the car will be unlocked, locked, or performs some other operation. Cyber criminals record this transmitted frequency signals, by using different devices. When they get a chance, they replay those recordings and perform the same action. And they can jam receiver of car by flooding it with high amount of radio frequency signals. This can cause you to have technical problems using your Key fob. This cyber crime can take place at a distance of about fifty meters approximately. So in this way they can do car lock, unlock and many more things without Key fob. Which you can't even imagine.

Let's find out how to stay safe from such cyberattacks -

1) In any public or crowded place i.e. public parking's, malls etc. If you want to park the car on the spot, use the key rather than using the key fob.

2) Request "Rolling Key fob" from your car service provider. In "Rolling Key fob" the frequency changes after each transmission of signal. So that cyber criminals (Hacker) cannot stage the frequency through replaying frequencies.

3) If you suspect any person in this way, report it immediately to the police or cyber crime branch near you.

4) Avoid using Key fob as much as possible.

5) After parking the car, close all windows, doors etc of your car without fail.

Mast. Mayank Gite Student SYIF

Operation Of Dc-Dc Boost Converter For Photovoltaic Array Under Maximum Power Point Tracking Using Perturb



One of the major concerns in the power sector is the day-to-day increasing power demand but the unavailability of enough resources to meet the power demand using the conventional energy sources. Demand has increased for renewable

sources of energy to be utilized along with conventional systems to meet the energy demand. Renewable sources like wind energy and solar energy are the prime energy sources which are being utilized in this regard. The continuous use of fossil fuels has caused the fossil fuel deposit to be reduced and has drastically affected the environment depleting the biosphere and cumulatively adding to global warming.

Solar energy is abundantly available that has made it possible to harvest it and utilize it properly. Solar energy can be a standalone generating unit or can be a grid connected generating unit depending on the availability of a grid nearby. Thus it can be used to power rural areas where the availability of grids is very low. Another advantage of using solar energy is the portable operation whenever wherever necessary.

In order to tackle the present energy crisis one has to develop an efficient manner in which power has to be extracted from the incoming solar radiation. The power conversion mechanisms have been greatly reduced in size in the past few years. The development in power electronics and material science has helped engineers to come up very small but powerful systems to withstand the high power demand. But the disadvantage of these systems is the increased power density. Trend has set in for the use of multi-input converter units that can effectively handle the voltage fluctuations. But due to high production cost and the low efficiency of these systems they can hardly compete in the competitive markets as a prime power generation source.

The constant increase in the development of the solar cells manufacturing technology would definitely make the use of these technologies possible on a wider basis than what the scenario is presently. The use of the newest power control mechanisms called the Maximum Power Point Tracking (MPPT) algorithms has led to the increase in the efficiency of operation of the solar modules and thus is effective in the field of utilization of renewable sources of energy.

DC-DC BOOST CONVERTER

Boost converter steps up the input voltage magnitude to a required output voltage magnitude without the use of a transformer. The main components of a boost converter are an inductor, a diode and a high frequency switch. These in a co-ordinated manner supply power to the load at a voltage greater than the input voltage magnitude. The control strategy lies in the manipulation of the duty cycle of the switch, which causes the voltage change.

MODES OF OPERATION

There are two modes of operation of a boost converter. Those are based on the closing and opening of the switch. The first mode is when the switch is closed; this is known as the charging mode of operation. The second mode is when the switch is open; this is known as the discharging mode of operation. **Charging Mode**



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In this mode of operation; the switch is closed and the inductor is charged by the source through the switch. The charging current is exponential in nature but for simplicity is assumed to be linearly varying. The diode restricts the flow of current from the source to the load and the demand of the load is met by the discharging of the capacitor

Discharging Mode

In this mode of operation; the switch is open and the diode is forward biased. The inductor now discharges and together with the source charges the capacitor and meets the load demands. The load current variation is very small and in many cases is assumed constant throughout the operation.

Ms. S. S. Sangamnere TA - EE Department

Jelly Fish – A source of Electricity



Jellyfish are found in every ocean ,from the surface to the deep sea. A few jellyfish inhabit freshwater. large often colourful, jellyfish are common in costal zones worldwide. Jellyfish have roamed the seas for at least 500 millions

year, and possibly 700 million years or more, making them the oldest multi-organ animal. Jellyfish bloom formation is a complex process that depends on ocean currents, nutrients, sunshine, temperature, season, prey availability. reduced predation and oxygen concentrations. Ocean currents tend to congregate jellyfish into large swarms or "blooms", consisting

of hundreds or thousands of individuals. Blooms can also result from unusually high populations in some years. Jellyfish are

better able to survive in nutrient-rich, oxygen-poor water than competitors, and thus can feast on plankton without competition. Jellyfish may also benefit from saltier waters , as saltier waters contain more iodine, which is necessary for polyps to turn into jellyfish. Rising sea temperature caused by climates may also contribute to jellyfish blooms, because many species of jellyfish are relatively better able to survive in warmer waters. Here the jellyfish has a vitamin called green fluorescent protein Aequorea Victoria jellyfish harbors a specific protein called Green Fluorescent protein (GFP) that fluoresces after absorbing UV radiation. This fluorescence reveals to us that this proteins does

transform energy and re-emits it after absorbing energy from UV radiation. If an efficient design is created, more colours of fluorescing protein will be able to be incorporated, and thus further increase the efficiency of the dye- sensitized solar cell by expanding the range of spectra that can be absorbed by the cell and transformed into electricity. Already, there are design of Dyesensitized solar cell that included many colours of dyes togethers in one array. It mostly finds in artic and antartic regions where there is no sunlight. So we find fire fly which sunlight the produce energy.

> -Gaurav Kate, Student, SYEE

Nanotechnology



Nanotechnology is the science of management and manipulation of atoms and molecules to design a new technology. Nanotechnology is the supramole cular technologies, which

functional systems at the molecular or supramolecular scale.

Interestingly, one nanometer (nm) is equal to the one billionth or 10⁻⁹, of a meter

The concept and idea of nanotechnology originally discussed first time in 1959 by Richard Feynman, the renowned physicist

Richard Feynman, in his talk "There's plenty of room at the Bottom" described the feasibility of synthesis via direct manipulation of atoms. However, in 1974, the term "**Nano- technology**" was first used by Norio Taniguchi

Major field of Research

Following are the major fields in which nanotechnology is being researched.

- Advanced computing Developing super computer
- Electronics Developing conductors and semiconductor
- Medicines Developing technology to treat cancer(especially breast cancer)
- Textile engineering Nanofabrication, etc.

Application of Nanotechnology

- Manufacturing of life-saving medical robots
- Making available networked computers for everyone in the world
- Plant networked cameras to watch everyone's movement (Very helpful for the administrative service and maintaining the law and order)
- Manufacturing untraceable weapons of mass destruction



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• Swift inventions of many wonderful products useful in everyday life.

• Likewise, the molecular technology has range of potentials that benefits to humankind, however at the same time, It also brings severe dangers. Untraceable weapon of mass destruction is an ideal example of its deadliness.

Nanotechnology is Multidisciplinary



Major Branches of Nanotechnology

Material

Chemistry

Surface science

Organic chemistry

Molecular biology

Microfabrication

Semiconductor Physics

Molecular engineering

Molecula Biology

Physics

Nano Technology

Contributory Disciplines of Nanotechnology

the development of science of nanotechnology.

Following are the major disciplines that integrated into

Applied Mathematics

& Computer Science

- Nanoelectronics
- Nanomechanics
- Nanophotonics
- Nanoionics

Electrical & Mechanical

Engineering

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Implications of Nanotechnology

Every coin has two faces, similarly the application of Nanotechnology at industry scale. i.e. Manufacturing nanomaterials might have negative implications on human health as well as on the environment. The workers who especially work in such industry where non materials are used are more vulnerable, as they inhale airborne nanoparticles and nanofibers. These Nano materials may lead to a number of pulmonary diseases, including fibrosis etc.

Ms. D. B. Mogal LSH

Laser



A laser is a device that emits lights through a process of optical amplification based on the stimulated emission of electromagnetic radiation. Laser are often described by the kind of lasing medium they use -Solid state, Gas state, Excimer, Dye, or

Semiconductor. The full form of **light amplification by** stimulated emission of radiation. It is an electronic device that produces light, actually an electromagnetic radiation. this electromagnetic radiation is done through the optical amplification. the first laser was built in 1960 by Theodore H. Maiman at Hughes research laboratory, based on theoretical work by Charles Hard Townes and Arthur Leonard Schawlow.

A laser differs from other sources of light in that it emits light which is coherent. Spatial coherence allows a laser to be focused to a tight spot, enabling application such as laser **cutting** and **lithography**. Spatial coherence also allows a laser beam to stay narrow over great distance,

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enabling application such as the laser pointer and lidar. laser can also have high temporal coherence can be used to produce pulses of light with a broad spectrum but duration as short as a femtosecond. Laser are used in optical disk drivers, laser printers, barcode scanner, DNA instruments, sequencing fiber optic, semiconducting chip manufacturing ,and free space optical communication ,padre surgery and skin treatment, cutting and welding material, military and law enforcement services for marking target and measuring range and speed, an in leader lightning displays for entertainment.

Fundamental

Laser are distinguished from other light source by their coherence. Spatial coherence is typically expressed through output being a narrow beam, which is diffraction limited. Laser beams can be focused to very tiny spots, achieving Avery high irradiance or they can have very low divergence in order to concentrate their power at a great distance. Temporal coherence implies a polar length wave at a single frequency, whose phase is correlated over a relatively great distances along the beam. A beam produced by a thermal or other incoherent light source has an instantaneous amplitude and phase that vary randomly with respect to time and position, thus having a short coherence length.

Laser are characterized according to their wavelength in a vacuum. Most "single wavelength" lasers actually produce radiation in several modes with slightly different wavelength. Although temporal coherence implies monochromaticity, there are lasers that emits a broad spectrum of light or emit different wavelength of light simultaneously. Some lasers are not a single spatial mode and have light beams that diverge more than is required by the diffraction limit. All such devices are classified as "laser" based on their methods of producing light i.e, stimulated emissions. Laser are employed where the light of the required spatial or temporal coherence cannot be produced using simpler technologies.

Design

A laser consist of a gain medium, a mechanisms to energize it, and something to provide optical feedback. The gain medium is a material with properties that allow it to amplify light of a specific wavelength that passes through the gain medium is amplified (increases in power). For the gain medium to amplify light, it needs to be supplied with energy in a process called pumping. The energy is typically supplied as an electric current or as light at a different wavelength. Pump light may be provided by a flash lamp or by another laser.

The most common type of laser uses feedback from an optical cavity—a pair of mirrors on either end of the gain medium. Light bounces back and forth between the mirrors, passing through the gain medium and being amplified each time. Typically one of the two mirrors, the output coupler, is partially transparent. Some of the light escapes through this mirror. Depending on the design of the cavity (whether the mirrors are flat or curved), the light coming out of the laser may spread out or form a narrow beam. In analogy to electronic oscillators, this device is sometimes called a *laser* oscillator.

Applications:

Laser technology must have a various application fields, in almost any of the science field you may observe laser technology applications and devices. In the following I mention the applications of such technology as far as I encountered, observed, used, or read about:

- Computer devices such as laser mouse, laser presentation, CD ROMs and DVD ROMs Astronomy and communication application.
- Medicine, Surgery, and Health
- 2ar Machines, guns and tanks
- Cutting matters in metallurgy industry and related industries
- Robotics especially in images processing and calculating distances
- Toys

Future Scope of laser

Research involving new uses of lasers continues at an amazing pace. Many new discoveries and development in science and technology today are possible only because of laser. One area of research in which lasers have made a big impact is nanotechnology- the development of super -

tiny machines and tools. Laser light can be controlled very precisely, so scientists can use it to perform extremely fine operations. For example, lasers could be used to cut out to make molecule size motors. Lasers can also be used as "optical tweezers" to handle extremely small object such as molecules. Scientist are even beginning to users to change the shape of molecule. They do this by varying the laser's wavelength.

> Miss. Nikita Walke Student– SYCM



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Happy Gandhi Jayanti, World Teachers' Day, World Students' Day and National Unity Day, Happy Dussehra to All Readers on the behalf of Principal, Faculty, Supporting Staff and Students.

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