



ABHIVARG

Volume 4
Issue 2

TECHNOLOGICAL DEVELOPMENTS,
NOW AND THEN FOR OUR SOLDIERS

ABHIVARG 4.2

TECHNOLOGICAL DEVELOPMENTS, NOW AND THEN FOR OUR SOLDIERS.

DEAN'S MESSAGE

My dear students,

“How’s the Josh” and I know many of you will have the involuntary reply “High Sir!”. If I ask you what is your emotional status today? You will start thinking which emoji to show. Can you tell me what are these? Are they your voluntary responses? Think it over.

Today media has flooded our minds with all such mind catchy slogans and trends that to many situations we react without a pause and what comes out as our response is what has been pumped in our minds unknowingly through social media, picture or print.

Don’t you think it is high time that we understand that we are falling prey to these media tactics and are losing our capacity to pause, think and respond? This has led to an exponential increase in many social problems related to relationships, addictions, psychological disorders, emotional breakdowns, etc.

Today I feel that we all are at a stage where media has enslaved us. It has made us confused, curious and greedy minds. We say “Yeh dil mange more!” but what we do not know.”.

So we need to identify a methodology or a process which will help us to remove these clouds of confusion and satisfy our curiosity and give direction to our greed that will benefit the society.

Indian scriptures and our holy books are full of stories and knowledge to guide us and give direction to us so that we can see the opportunities in difficult times and come out of any situation as matured individual with the capacity to handle tougher situations.

Our ancient scriptures can be guiding light to all our confusions and curiosity. So it is my appeal to all that you should read such books.



Dr. Lochan Jolly
DEAN (SSW)

Although many of us consider that it is something which retired/old people should read but believe me it is at this age when we need direction and these books are our best guides.

Take care.
God bless you all.

HOD'S MESSAGE



Dr. Vinitkumar Dongre
HOD, EXTC

Dear readers,

I would like to congratulate the team of our Electronics and Telecommunication magazine, on coming up with another edition of Abhivarg, which is "ABHIVARG 4.2". Someone once rightly said 'Coming together is a beginning. Keeping together is progress. Working together is success'. This is proved correct by enthusiastic faculty members and passionate students, who had been working on this magazine for a long time

The theme of the magazine is the technological development now and then for our soldiers, it is dedicated to the soldiers who were attacked and martyred during pulwama attack. Using the best of technologies we have won over the terrorist group.

The magazine contains total information from the experts of domains such as industry, successful alumni, learning students, teachers of our college, experienced parents and the motivational speakers. It has helped people to think about many innovative ideas and research on it. They have referred to some of the out of the box ideas. The magazine promotes students to show their talents. The students have given articles on technical topics on which they have either worked or willing to work in near future. The motivational speakers gave us a few tips on the exams that the students will need while appearing for it in near future and also motivated them to work harder for a brighter and successful life ahead. Whereas the industries gave our readers knowledge about all that is trending in the companies out there. So our magazine is a bucket full of knowledge and useful information which will enlighten many of us.

A section is dedicated to the extra activities happening in college for all the branches.

Lastly I would like to sincerely thank the editorial and the design committee for presenting it in the best way they could. I would also wish my students and readers all the best for their future.

FACULTY INCHARGE'S MESSAGE



Ms. Megha Gupta
FACULTY IN-CHARGE

Hello my dear students,

This special edition of Abhivarg is a tribute to our soldiers who had served our nation till the end of their lives. Our soldiers are in position 24 by 7 for our nation's safety. So, how our engineers are contributing to help them technologically? This edition of Abhivarg, defines and explains us the technologies used and developed by our young minds to enhance India's technological power.

As always this time also we had invited articles from industry, alumni, faculty members and our students. An overwhelming response from our alumni is well appreciated. Our students from second year, third year and final year of engineering are developing small projects which can be converted into good products later on. These ideas have been presented here as articles. Third year students do have project based learning in various subjects, they had articulated their spectacular thoughts and presented here. Final year students have developed their projects and written articles on the same.

Our alumni are our strength and they had put in efforts and time in spite of their busy schedules to help their juniors learn new technologies and current industry trends.

Corporate relations are well managed in our institute, so the industry experts in our domain have also contributed in our magazine with some great ideas for future technologies.

So happy reading!!

All the best!!

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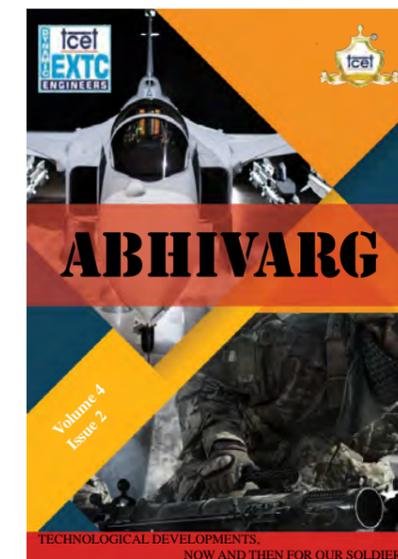
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FEATURED

ARTICLE



Cdr Vijay Pratap Singh
Former Jt. Director
Indian Navy

BE(Elect. & Elex), MBA(HR), PGD-FM, PGDCA, PMP, ISO, SQA, SA(IIT) ADIT(C-DAC), Advance Space Technology (ISRO)

Adjunct Professor, EXTC dept., TCET

Background

The space technology has grown manifold during last decade across the Globe and is still on a fast track growth path. Indian Armed Forces are also geared up to use state-of-the-Art space technology for gathering and exploitation of Military Intelligence. Military intelligence in the form of real time pictures/ images and videos are being developed and exploited as actionable intelligence against enemy or adversary. These technologies are frequently used by Military leaders worldwide. The space-based tracking, surveillance and live data transfer between Defence control centers and military operation areas or war zones are playing bigger role in the current scenario.

Exploitation of Geo spatial data by Indian Armed Forces

In current scenario, India too has advanced further by amalgamating its R & D programmes with technological developments of ISRO to make our Armed forces combat ready at any time against any misadventure initiated by hostile countries. The accurate and effective operational capabilities and show of strength of Indian Armed Forces have been commendable due to smooth adoption of new technological changes and progress in field of Electronics, Communication & IT infrastructure. To achieve this in modern warfare, effective and error free Geospatial Data has been developed which plays an extremely vital role during military hostilities. During last 8-10 years, India developed its remote sensing capability, cartography and handling of Military Intelligence data using indigenous satellites rapidly and joined the league of top 6 developed Nations in the world.

Geo-spatial Data

Geo-spatial data are collection of composite satellite image data received from different types of remote sensing sensors such as Sun synchronous optical sensors, Synthetic Aperture Radar, TV cameras, UAVs, Very high-resolution radio meter sensor etc.

Generation and Exploitation of Real Time Geo-Spatial Satellite Data for controlling Military Operations against Adversaries

Why Geospatial data is required?

Geo-spatial data is a specialized information for the exploitation and analysis of Satellite imagery and Geospatial details received from various Remote Sensing Satellites to describe, assess and visually depict physical features, location and geographically referenced activities at designated targets of enemy areas.

Application of space technology

enables Defence Forces to **identify, collect, store and manipulate data to create geospatial information through critical thinking, geospatial reasoning and analytical techniques. Therefore, real time geospatial data is most important for quick decision-making process while handling. strategic operations.**

Ground receiving stations

popularly known as **Earth stations** play extremely important role in **acquiring real time Geo-spatial data from designated Remote Sensing Satellite. Data received from satellite gets geometrically, radiometrically corrected and geocoded.** The data is further **processed and analysed to indicate the location of targets. Thereafter, processed data is transmitted to Military users at operation sites in real time mode through Wide Area Network (WAN).** WAN consists off varied wired and wireless segments upto end users.

Raw and few critical Geospatial data are archived simultaneously in highly advanced storage devices of Data Centre for future use. The **Geo-Int network** is connected through Geo stationary satellite, Remote sensing satellites, Optical fibre backbone, high end network and communication devices extending upto all stakeholders and end users at establishments and border area.

Geospatial Intelligence Data

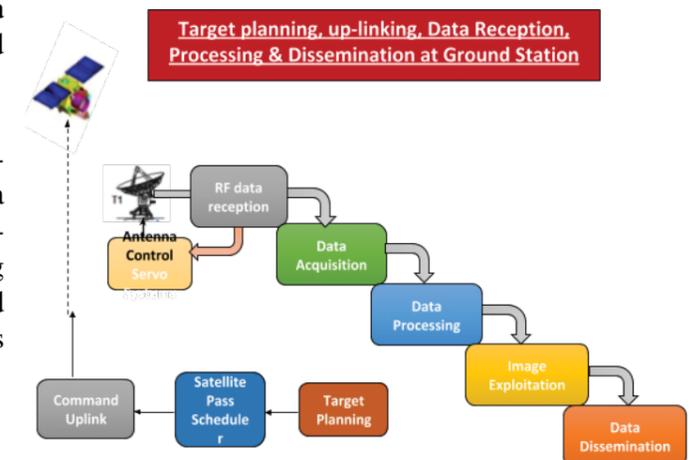
is generally known as GEOINT and is extremely useful to pin point the following details of enemy area: -

- 1)Where are the man-made structures?
- 2)How to navigate through them?
- 3)What activities are taking place there?
- 4)What did the area look like before?
- 5)What does the area look like now?
- 6)What might it look like after an attack?

GEO-INT network

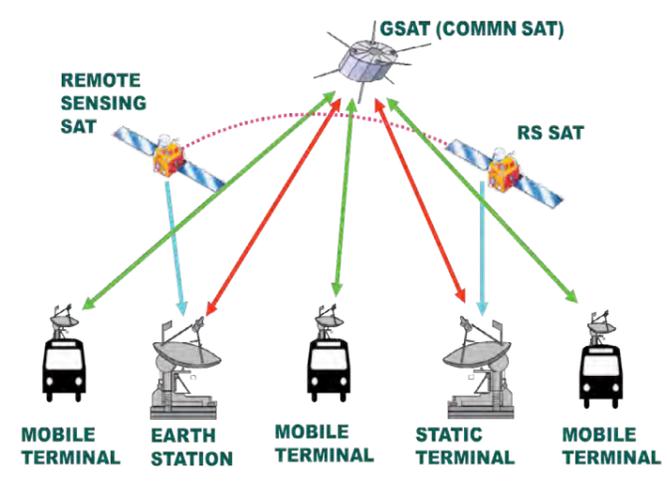
Geospatial data received from various indigenous satellite sensors are **processed, archived and transmitted to users** in Indian Armed Forces involved in Military operations using data and voice network.

The following conceptual block diagrams pertaining to **satellite data reception, processing and transfer through dedicated network systems will further enhance the understanding as to how the Geo spatial data is so special and useful for Military operations (from reception to transfer upto end users): -**



Processed Satellite Imageries of Military targets

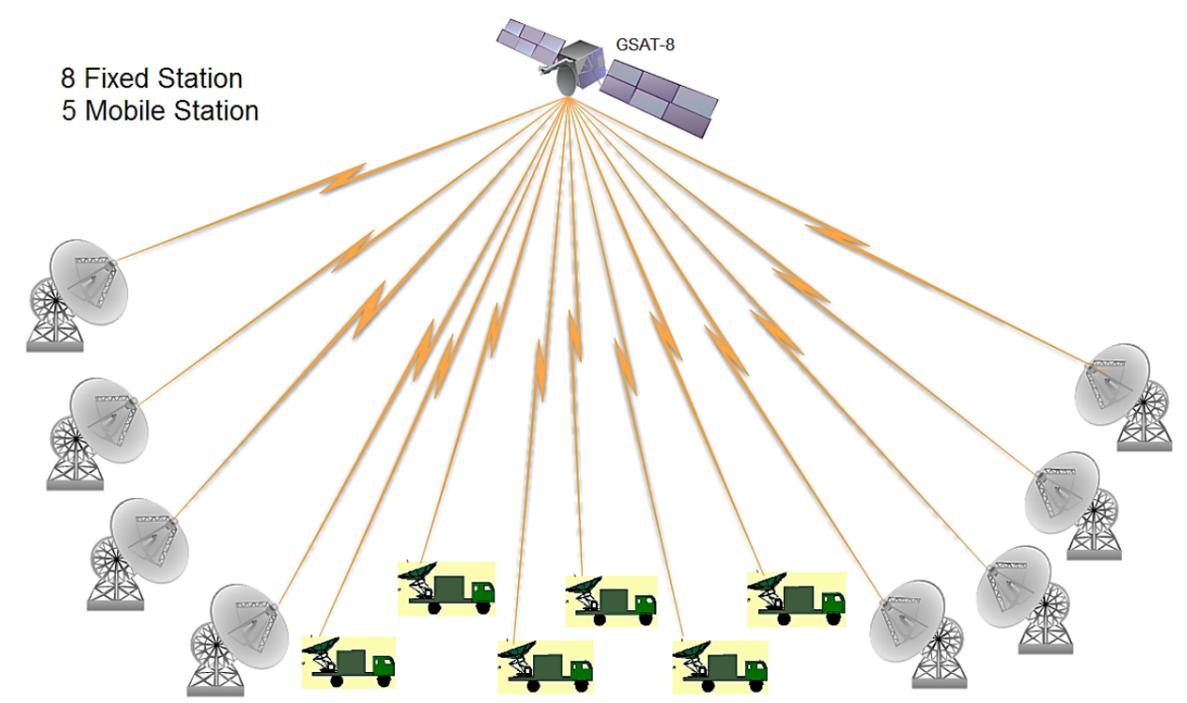
PoK Terrorist Camps



Geo-INT Network Framework

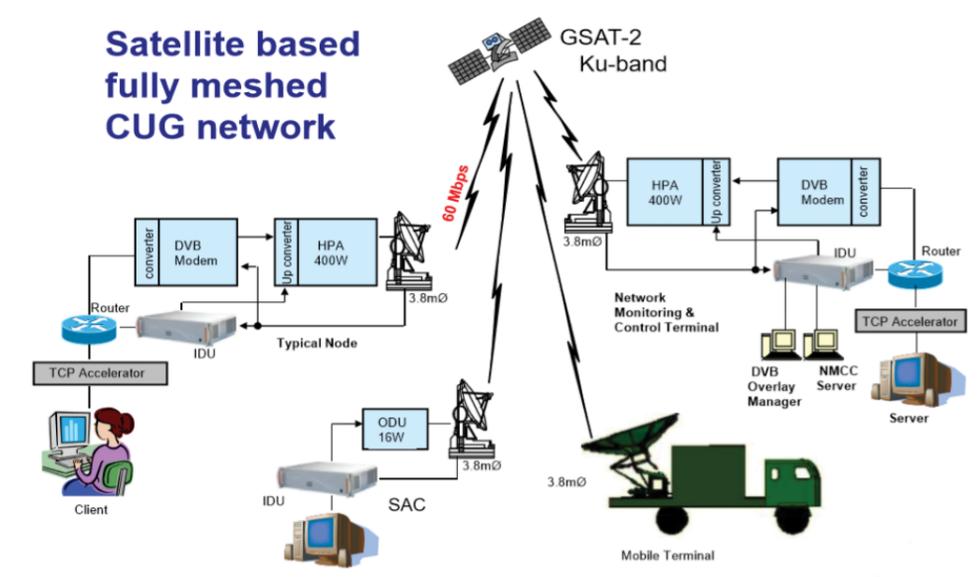
Wireless Network connecting Geo-stationary Satellite, Earth stations & Mobile Military terminals for secured transfer of Geo-spatial imagery data

Overview of DDS Network

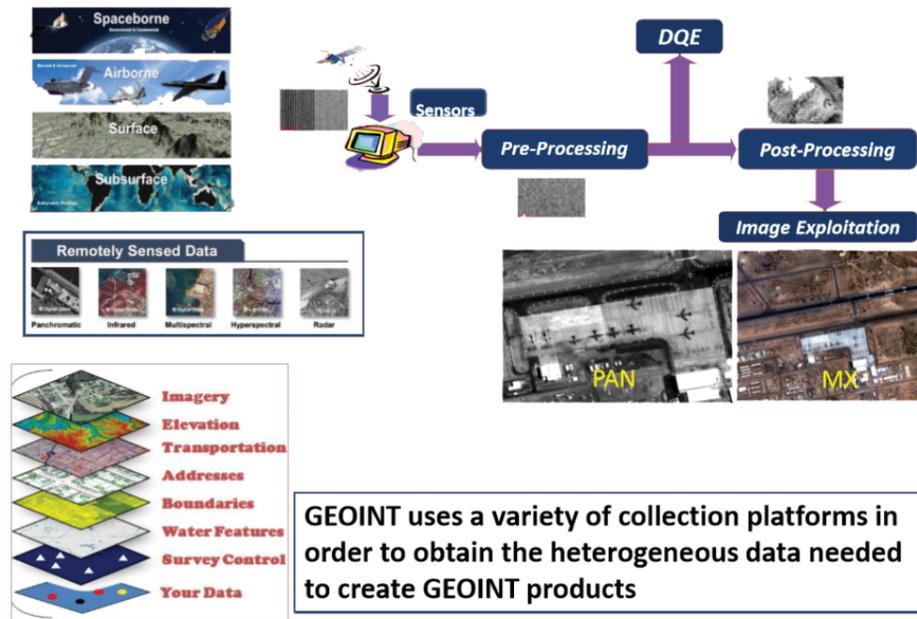


Wireless reception & transfer setup between GSAT-2 and Static/Mobile Earth station terminal

DDSP Network



GEOINT LEVERAGES **WIDE ARRAY** OF PLATFORMS AND DATA



Tactical information warfare Network flow.

The entire war machines, missile launchers, Fighter Aircrafts, Support Aircrafts, Artillery systems, tanks, communication systems, Naval Warships, Submarines and Control stations are brought to a common highly secured network while undertaking combined military operations.



Last segment of fighting units along with soldiers are also part of highly encrypted secured voice and data network in case of any hostility.



Conclusion

Indian Armed Forces under Ministry of Defence, Govt of India have achieved significant progress in the field of tactical space technology and developed a highly advanced and sophisticated secured network control system using Geo stationary and Remote sensing satellites with technical support of Department of Space, ISRO and Govt R&D organisations under “Make in India programme”. Many large private companies are also associated with ongoing Defence programmes. The Military operation displayed in recent Bollywood movie “URI” was also based on Real Time Geospatial Satellite Data Network.

INDUSTRY

ALUMNI



Kripal Singh Shekhawat
Technical Consultant
Verisk Analytics

Blockchain as a solution to issues faced by Indian SMEs

Abstract:

Blockchain is one of the most fascinating digital disruptors impacting today's business landscape. Though still in its discovery stage, early suitable applications focused around financial systems, banking, payments and record keeping show that blockchain promises to revolutionize enterprise operations.

Blockchain is a type of system that maintains an entity state in a string of distributed blocks that are chained together in a sequential order using a cryptographic hash signature. This enables blockchain to act as a shared ledger with participants who have legitimate permission for inputs and corroboration. Distributed ledgers spread across various sites, countries and organizations constitute an entity record. It differs from a traditional system of records in that it resides on distributed cloud networks. The potential impact of blockchain can be significant across enterprise business processes. It can increase efficiency through eliminating intermediaries, resulting in simplified operations by reducing the cost and time related to reconciliations. It also has the potential to enable collaboration with partners and clients.

Challenges faced by SMEs (Small to Medium Enterprises) in India:

Processes Handling and sharing enterprise data in a transparent yet secure still presents a challenge for many SMEs. Need to deliver business results efficiently and at speed Blockchain can potentially be used when businesses must provide, accurate on-time information to enterprise stakeholders, regulators and shareholders. In order to speed up business processes and information flows, the ability to share and update distributed ledgers across relevant parties can be a significant accelerator. The shared ledger is at the core of these solutions which each party can access at once. All copies of the ledger are updated simultaneously and synchronized, thus reducing cycle time in a business process. Systems that enable multi-party interaction and tracking of inventories, location, and financial status, as well as cross-functional record keeping are important for efficient functioning of a business in today's competitive environment. Applying blockchain in such processes can help reshape the way an enterprise works with its partners and clients and can also result in its growth

Answering the following questions can determine if blockchain is appropriate for an identified business scenario:

- 1) Do multiple internal or external entities share data?
- 2) Do multiple internal or external entities update data?
- 3) Is there a requirement for information verification?
- 4) Can intermediaries be removed?



Using Blockchain to Reimagine Process Solutions:

A group of 11 Indian banks have teamed together to unveil the nation's first blockchain-linked funding for SMEs. The meetings among the participating banks are being organised by a consortium called the Blockchain Infrastructure Company (BIC).

This move is expected to allow Indian lenders and banks to make judicious decisions through transparently accessing public data. Media reports also suggest that the system will remove information asymmetry between large corporates and SME lenders.

In May 2018, Infosys, along with seven Indian banks, set up the India Trade Connect, a blockchain-based trade network with a similar aim - to increase transparency, and better manage risks in trade finance operations, while cutting time to deliver supply-chain financing.

How can blockchain prove to be useful ?

Finance Process Simplification:

Blockchain can potentially enhance productivity in finance operations. At the center of a finance solution is the shared ledger, which each participant accesses simultaneously. This could impact: Management reporting Inaccurate, slow data reporting can result in constraints during decision making, increasing the cost of delivery and resulting in inaccurate capital spend. Blockchain can be applied to publish financial performance data accessible by all stakeholders in real time, thereby removing the dependency of data visibility through standard reporting cycles. This applies for regulatory and management reporting. Transaction reconciliation Reconciling differences in ledgers often requires many hours of effort for finance functions. A shared ledger approach can be beneficial by allowing all parties

Accuracy of financial data Blockchain can simplify tracking transactions, ensuring that financial data is secure and simple to analyze. The accuracy of all transactions and accounting entities are maintained in the identified ledgers, thus helping in preventing fraud and data corruption

Supply Chain Management:

Blockchain can revolutionize supply chain automation due to the inherent nature of its processes-crossing organizational boundaries. A typical problem in this process is that suppliers, service vendors and clients interact with each other via certain third party entities instead of directly with each other. Contracts have to be managed by lawyers and bankers, often causing additional costs and potential delays. Another potential problem is that

products and parts are sometimes difficult to trace back to suppliers. The power of a distributed ledger can be utilized effectively to track payments, in-transit status, location, dates and deliveries.

Key Elements of Blockchain Solutions:

An implementation analysis of blockchain reveals how each significant element in an application design scenario would play out, and what's in it for each stakeholder. Blockchain as a single source of truth: Blockchain will act as system of record for an entity in a business process, automatically tracking every change to its lifecycle. This makes the process more auditable, trustworthy, and transparent. Secure: The cross-process participants such as logistics, finance, suppliers and the customers can be known and permissioned onto the blockchain network. Shared data model: A solution-specific data model for participating organizations can be maintained on the blockchain. Business rules and smart contracts: Business rules governing the relationship between people.



Conclusion:

Like any other emerging technology, blockchain has its evolution cycle. It will continue to evolve with more innovative ways of usage. The examples of potential enterprise processes above are only a few such applicable areas. It is important to know what this can achieve for businesses, and when it is applicable. If an organization has the need to share and record information with multiple entities and ascertain the identities of participants in a transactional workflow, there are frequent exchanges with others that can be automated and preprogramed. By freeing up valuable time and resources, applying blockchain can bring in value to the country's SME's which account for around 40% of total gdp output

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ALUMNI



Application Development Analyst

Accenture Solutions Pvt. Ltd.

SAP- The Game Changer in modern industry

Being a part of the professional world for about 4.5 years with Accenture made me realize the importance of demonstrating the best. As time passed, dealing in SAP not only gave me the opportunity to utilize my technical skills to the fullest but also motivated me to have a greater insight into this area.

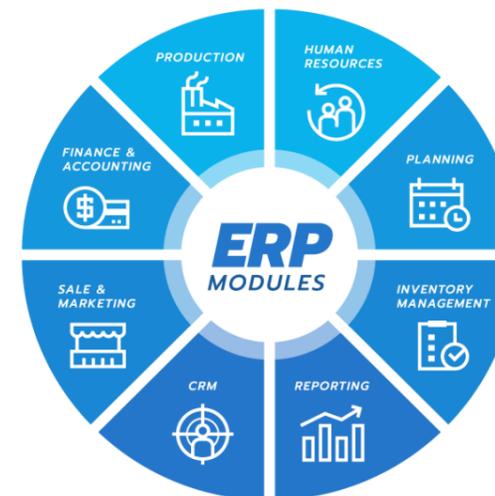
For those who don't know about it, SAP ERP is an enterprise resource planning software developed by the German company SAP SE. SAP ERP incorporates the key business functions of an organization. For a layman to understand, it is a relational data-base management system [RDBMS] with pre-configured business rules reports.

Some key business processes included in SAP ERP are Sales & Distribution, Materials Management, Production Planning, Logistics Execution, and Quality Management, Financial Accounting, Management Accounting, Financial Supply Chain Management, Training, Payroll and many more.

Based upon the business processes SAP has different modules for example Sales & Distribution (SD), Material Management (MM), Finance (FI), Supply Chain Management (SCM) etc.

SAP has a 3-tier architecture. Those software components that specialize in interacting with end- users form the Presentation Layer, those specialized in processing business applications form the Application Layer, and lastly the Database Layer having components specialized in management, storage and data retrieving.

Over the time SAP has made a huge market base by becoming the leading ERP software, implemented at the backend of many giants in the tech-world. It has acquired more than 67% of world's business.



Many services and product-based companies have understood the importance of using SAP as it allows easier global integration, completely customizable user interface and provides real-time information, reducing the possibility of redundancy errors. All these factors have worked in making it the most favorable ERP system as it has helped in creating a more efficient work environment for employees and allowing end users to dictate the operational structure of a product.

With the emergence of SAP HANA, the overall demand for such expertise has increased in discrete and process manufacturing industries, where the companies usually utilize a wider spectrum of SAP modules for different business areas. It's a good career option for freshers, but all it depends is on what fascinates you to work on something. As a fresher, when you are young and full of energy, it would make sense to take hard core programming jobs. Getting to work on one of the niche technologies will only be skyrocketing until you keep on upgrading your skills.

So, go ahead with SAP and make a mark. All the Best!!



ALUMINI

Introduction to R programming

In this section we are going to get introduced to R language using commonly used GUI's. R language is mainly used for Statistical Computing. It was first released in 1993 by Ross Ihaka & and Robert Gentleman. R is an open source software and is freely available under GNU public license

R is powerful language and has environment for statistical computing and graphics. Two GUI's can be used the first is RGUI and the second is RStudio. R language is widely used among statisticians and data miners for developing statistical software and data analysis, polls, surveys, etc. The latest version of R which is being used is R- 3.2.3 for Windows(32/64 bit). By default R for Windows comes with a GUI, know as RGUI. Alternatively one can use another GUI i.e. RStudio. RStudio is an Integrated Development Environment(IDE) for R. It indicates a console, a syntax-highlighting editor that supports direct code execution, as well as tools for plotting, history, debugging and workspace management.

RStudio has features like code completion, smart indentation, workspace browser and data viewer.

Below are some of the commands for RGUI.

Dir()-This command is used to list the contents of the current working directory.

Getwd()-This command is used to check the correct working directory.

Setwd():It is used to change the current working directory.



ANURAG SINGH

BATCH- 2015-2016

#Below is the Syntax in R

```
X<-123
Y<-234
Z<-sum(x,y)
Print(z)
[1] 357
```



R Programming Tips

The above code is explained as below:

- X and Y are objects in R
- The objects x and y hold the values 123 and 234 respectively. Based on the kind of values an object holds, their datatype is decided and assigned. Datatype in R is known as class of an object.
- Sum() & print() are functions
- # is used to place comments
- <- is the assignment operator

Classes are nothing but datatype of the object. Every object can have the following basic classes.

- 1) Logical - Example: True, False
- 2) Numeric- Example: 12.3,5,999
- 3) Integer- Example: 2L,34L,0L
- 4) Complex- Example: 4+3i
- 5) Character- Example: "Hello World", "True", "53.2","a"
- 6) Raw-Example: "Thakur" is stored as 49 6e 66 6f 73 79 73

Case Sensitivity in R

- 1) R is case sensitive, hence one must ensure the case sensitivity of the Objects that are defined when writing code in R.
- 2) In the following example, an attempt to perform the summation of individual vectors, to obtain the total marks, failed due to case sensitivity.

```
math<- 80
science<- 85
social<- 76
english<- 94
```

Objects in R

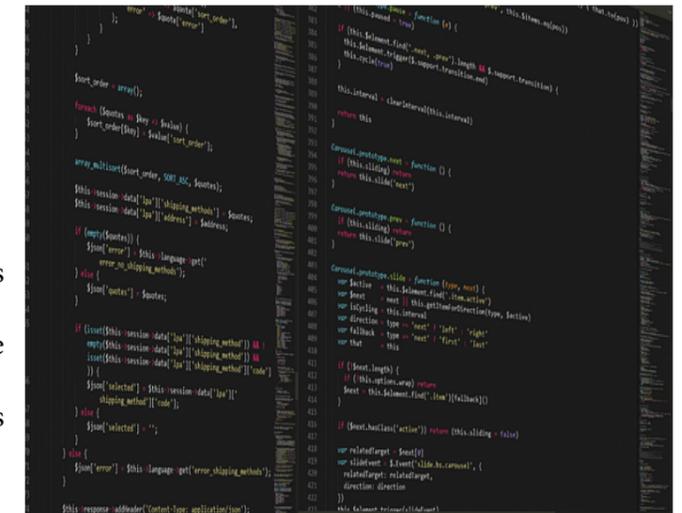
- 1) In any programming language we use various variables to store information. Variables are reserved memory locations to store values. This means that when you create a variable you reserve some space in the memory.
- 2) Objects in R can be a combination of different types of variables, functions, or data structures.

Coding Standards in R

- Code Quality is :- whether the codes achieves its objectives or whether the code is free from deficiencies i.e. it is readable, maintainable, extensible, etc.
- A quality code typically :- follows coding standards, is well documented, is easy to understand and maintain and is Secure.

Objects can be of the following types:

- 1) Vectors-It is a sequence of data elements of homogeneous type.
- 2) Lists- A list is an object consisting of an ordered collection of objects known as its Components.
- 3) Matrices-A Matrix is a collection of data elements arranged in a two-dimensional rectangular layout.
- 4) Arrays- An Array is the R data object that can store data in more than two dimensions.
- 5) Factors- A factor is a vector object used to specify a discrete classification(grouping) of the components of other vectors of the same length.
- 6) Data Frames- A Data Frame in R has two dimensional properties similar to a matrix but it can contain heterogeneous data. In a way a data frame is like a list with components as columns.



ALUMNI

Artistic Engineers in the Mysterious Universe

As observed, the current trend of Engineers with any specialization in India is to join an Information Technology (IT) company or pursue a management degree after completing their undergraduate degree. There are few who opt for higher studies in a core or an advanced Engineering field. However, the number of Engineers who contemplate of working in organizations like Defence Research and Development Organization (DRDO), Armed Forces and Space Science is a handful, and those who are actually focused about joining them are even lesser. This article will focus on the need for Engineers in Space Science since we have been closely associated with that field for a couple of years now. Let us take you through the roles of a few engineers and share our experience.

1] Electrical and related Engineers:

This category includes all the engineers that come under the core field of Electrical Engineering namely Electronics, Electronics and Telecommunication, and Robotics. They are one of the major contributors to Space Science these days as the current trend is all about digitization. The field harnesses the knowledge of Integrated Circuits, Communication antennae, power electronics and much more. Engineers are actively involved in designing, testing and implementing new types of detectors for Space observations. At times they are also responsible for opening up new fields in Space Science. An example of the same would be when radio engineers during the cold war were trying to detect communication from their rivals but instead found new objects beyond our galaxy which ushered a new era in Astronomy.



DHRUV BAL



NIKITA KHATIYA

BATCH - 2017-2018

2] Mechanical Engineers:

These engineers have been contributing to Space Science for the longest of times. They are the crucial link for converting the intellectual ideas of scientists into physical reality. Moreover, their importance has grown with the growing demands of satellites and telescopes required by scientists. The general job of an engineer with mechanical or related degrees is to design, test and manufacture the components for an astronomical instrument. Software's like SolidWorks, Catia, AutoCAD and many more are capable of designing such components. Such software's can be used for testing purposes which simulate space-like environments and also understand the impact of earth's atmosphere during the launch sequence.



3] Computer and IT Engineers:

With new generation telescopes producing terabytes of data each day, the need for computation is undeniable. In the early days, astronomers used to observe individual sections of the sky and make notes by hand. But the recent technological advances have made it possible to look at the entire observable Universe and store the data using electronics. This calls for the need of Automation to solve, analyze, and catalog numerous problems, datasets, and discoveries respectively. Coding has become an absolute necessity in this field. The common coding languages are Python, C, and C++ due to their progress in computations and speed.

Engineers are vital to the Space Science community more than anyone thinks. They are crucial to the progress of Science in our country as well as others. Conventional jobs might bring in immediate monetary relief; however, an engineer should always be on the lookout for new challenges. Conventional jobs like IT or management are decent, but, they are getting saturated pretty fast. "Unconventional" jobs related to Space Science and Defence organizations present new challenges each day and utilize engineers from every field possible. We strongly urge engineers to deviate from the norm and choose a path of their own making rather than following the crowd.



UNLOCK YOUR DATA

One must have come across the word 'Data' a lot many times in the recent years. 90% of the data on the internet has been created since 2016, according to an IBM Marketing Cloud study. You can take example of your cellphone devices. Previously we used Facebook as a Social Networking Platform. Then came WhatsApp and slowly and gradually there came tons of new applications and websites which connected people through different means on Social Media. You must have come across your one year older posts which are put forward as suggestions your on Instagram or Snapchat. The 'Rediscover this date' might show you your best memories from past few years. Where do all this suggestions come from? Obviously, there is an algorithm behind it but most importantly, one needs to save this data in a memory to preserve it. We click a lot of selfies and portraits and upload them on high quality free of cost with unlimited storage on Google Photos. The amount of data that is increasing is generating at a

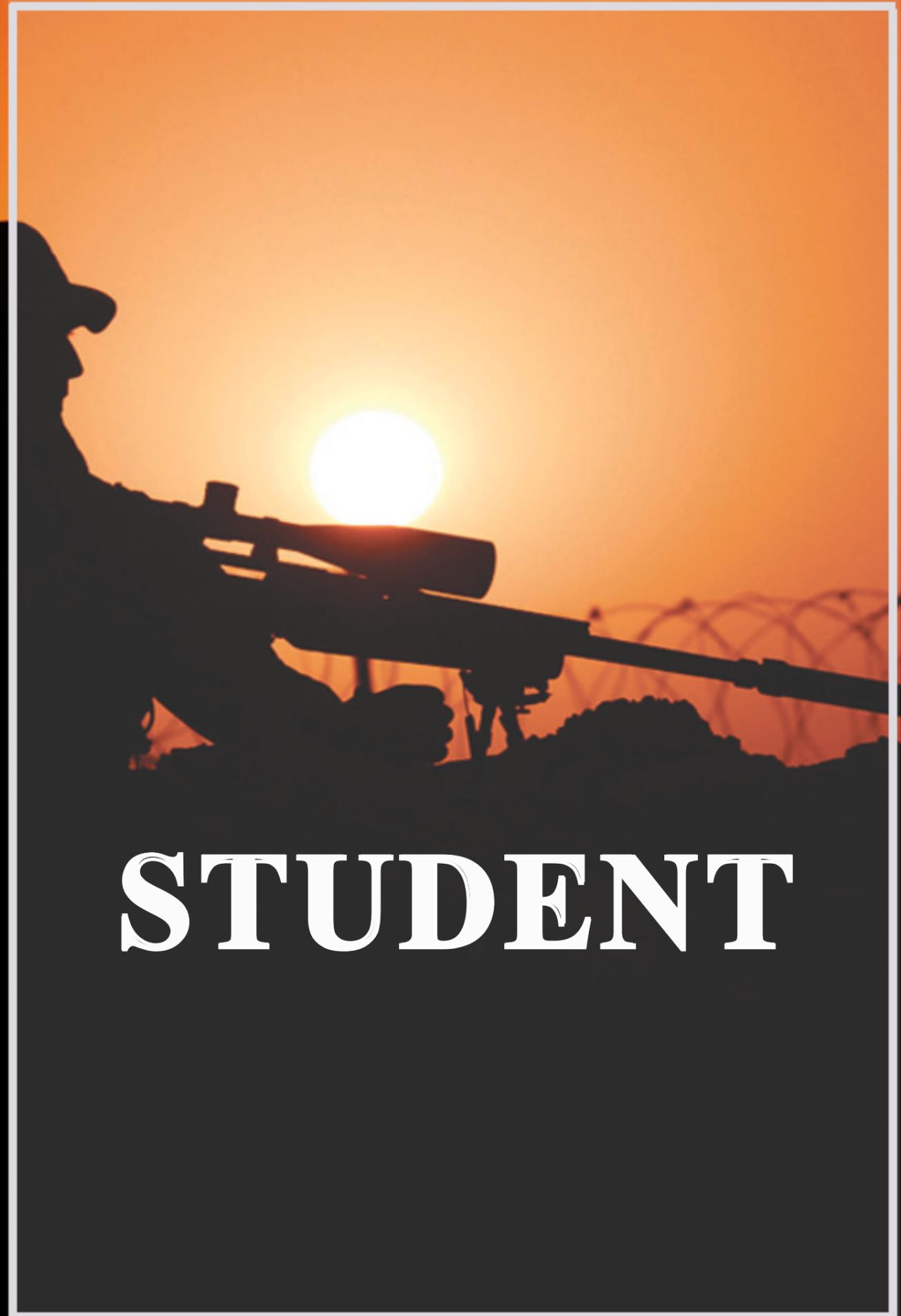
very high pace day by day. One question that comes up is what is the use of all such data? There has been recent news on Huawei, Facebook, Paytm and others for leaking data of customers. Companies are trying to make business out of this data. One major thing that this data is being used nowadays is learning. Researchers are trying to study this data through different models and produce business insights in order to reap big for the companies. It is due to this massive growth in data, words like 'Big Data', 'Machine Learning', 'Data Analytics', 'Business Intelligence' have come up. One important place where this data is being used at a very high scale is Data Science. As quoted by Frank Lo, data science is a multidisciplinary blend data inference, algorithm development, and technology in order to solve analytically complex problems. This branch of study analyses data and forms patterns and models to define the behavior of data and discover user interests and future demand and supply of various business needs.



AMIT PATHAK

BATCH - 2017-2018

It was in 2012 that people started believing Data Science to be the sexiest job of 21 st Century. This indeed has gained a lot of attention from people belonging to different backgrounds. Data Science does not need hardcore programming but a good statistics knowledge and reasoning capabilities. Many big and small enterprises are hiring Data Scientists at a very good emolument. The number of Data Science institutions have increased in recent years, a lot of them being online courses. We see a shortage of Data Scientists as industry ready professionals as well as tutors. If you love Statistics and forming models and patterns out of Data then you surely need to consider Data Science as a field for your future endeavour.



IMPLEMENTING PRODUCT TRACKING USING BEACONS



Sanjit Singh
BE EXTC B



Johan Palkar
BE EXTC B

Abstract:-

Beacons are tiny and inexpensive, micro-location-based technology devices that can send radio frequency signals and notify nearby Bluetooth devices of their presence and transmit information. Smart phones or other mobile devices can capture the beacon signals and distance can be estimated by measuring received signal strength (RSSI).

The closer the receptive devices the stronger will be the signals. Powered by coin batteries, they have a powerful ARM processor, memory, Bluetooth Smart module, and temperature and motion sensors. Apart from small standalone beacon devices, PCs, mobile phones and tablets with BLE support can all function as beacons, with the ability to both send and receive beacon signals. Various industrial sectors including retail, transit systems, enterprises, educational institutions, event organizing, finance, travel etc. have started leveraging beacons solutions to track and communicate with their potential and existing customers. A beacon fixed on to a shop wall or event location or any public place, can communicate easily with a corresponding Smartphone app and figure out where the person is located currently, with great accuracy. The retailers or event organizations can then come up with a much targeted or personalized communication based on the proximity of the customer.

Keywords— wireless devices, Bluetooth system, NFC.

Introduction:-

It is observed that retail industry is increasing exponentially where in sellers or the retailers try every new possible gimmick to attract customers. If you run a retail business, then utilizing beacon hardware can greatly help in attracting the attention of your customers, as it can serve your advertising messages straight to the user as soon as the user's device comes within a beacon's proximity within your store. These personal, tailored messages can not only assist in increasing up sell, but also serve as a medium to enhance the customer experience. In addition, beacons and loyalty apps can be used together to reward customers for a myriad of location-based actions.

Scope of the project:-

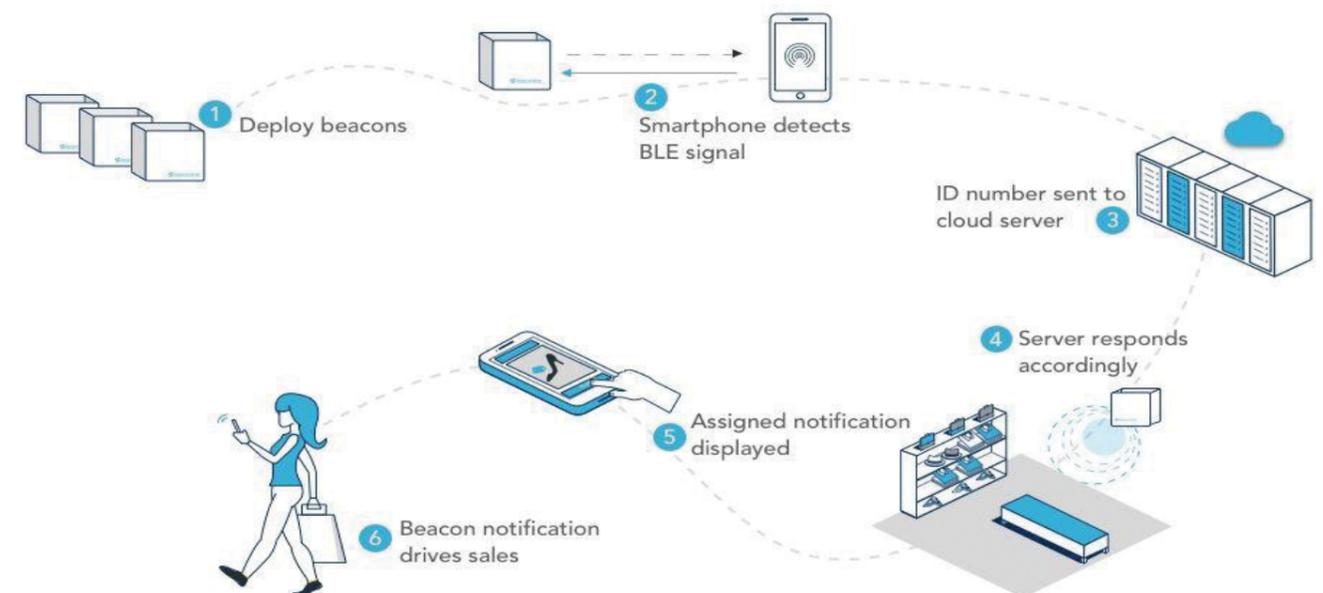
The focus on personalization in commerce has already demonstrated notable value and with beacon technology, personalization is essentially intrinsic. Everything ranging from coupons to product recommendations via beacons warrants personalization and if done right, can be extremely invaluable for your brand name and customer loyalty. Just as shopping applications such as ASOS can send personal shopping recommendations based on previous purchases, so too can beacons, yet with even more efficacy because the consumer can see and hold those recommendations in person. Moreover, if a store is particularly crowded with all salesmen occupied, consumers can still have a personalized, assisted experience by way of the beacons.

Using this Bluetooth low energy we would transmit some data through the broadcasting signals & at the receiving end the users would get flash notification about the signal IOS, Android, Windows Phone and BlackBerry, as well as macOS, Linux, Windows 8 and Windows 10, natively support Bluetooth Low Energy. Using this Bluetooth low energy we would transmit some data through the broadcasting signals & at the receiving end the users would get flash notification about the signal.

Beacons are small computers, roughly the size of a standard Wi-Fi router. Under the silicone casing, there is small ARM computer, combined with a Bluetooth Smart connectivity module, powered by a battery.

As part of indoor positioning systems, beacons use proximity technology to detect human presence nearby and trigger pre-set actions to deliver informational, contextual, and personalised experiences.

Proposed Design:-



We propose a system where we would use mobile Bluetooth to share its ID to the Beacon placed in its vicinity. Mobile operating systems including We propose a system where we would use mobile Bluetooth to share its ID to the Beacon placed in its vicinity.

Mobile operating systems including iOS, Android, Windows Phone and BlackBerry, as well as macOS, Linux, Windows 8 and Windows 10, natively support Bluetooth Low Energy.

When a user walks past an area where an indoor positioning system is set up, a beacon sends a code with a message to their mobile device. Here app solutions come forth: this coded message, which is shown in a form of a notification, can only be viewed with a mobile app (third party or brand mobile app).

Users receive coded messages from beacons via Bluetooth Low Energy (BLE) — a power-efficient Bluetooth technology developed for Internet of Things applications and devices. Moreover, an app doesn't even have to be running to be awakened by the beacon signal.

ARP SPOOFING AND PERFORMING MAN-IN-THE-MIDDLE ATTACKS

How beacons work



Problem Definition:-

Some of Problems faced by Retail shops are

- 1) During big sales & rush crowds, the salesmen cannot focus on all the customers. Hence they might miss on customer opportunity & credibility.
- 2) In School & colleges the initial time period is wasted by taking physical attendance. Hence we propose to implement a system which will save time in classrooms, which will automatically mark attendance of students/people present in the classroom.
- 3) Also help the retailers to showcase their product features & advertisement through such a technology with ease.

Problem Solution:-

Using this Bluetooth low energy we would transmit some data through the broadcasting signals & at the receiving end the users would get flash notification about the signal.

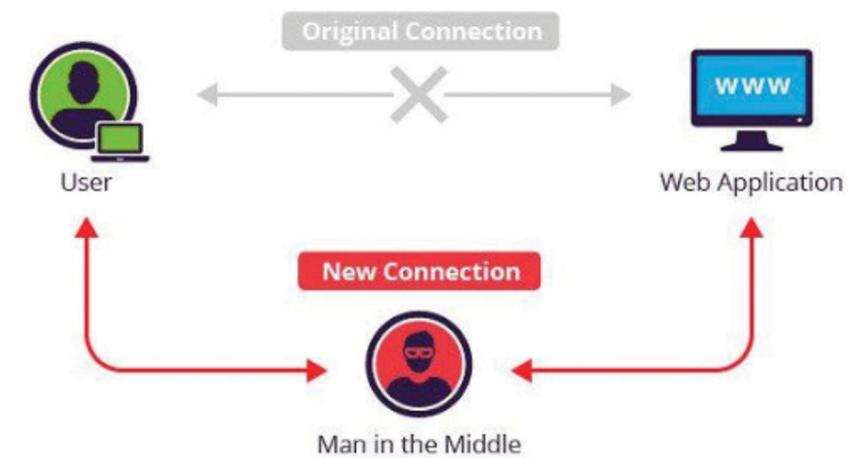


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Rishabh Tiwari
TE EXTC B

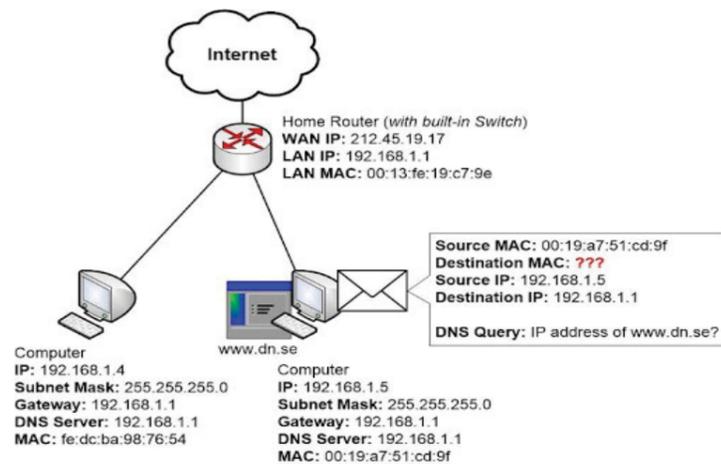


Ever sat in a Starbucks and used that “Free Wifi”? Yeah me too. But have you ever wondered if it’s even safe? I bet you it’s not and you will understand that in a couple of minutes. One of the most common and dangerous attacks performed is the man-in-the-middle attack inside local networks. A man-in-the-middle attack is exactly as the name suggests i.e. the attacker is in the middle of an ongoing communication between two parties. If executed properly, the attack makes the connection vulnerable to not only sniff the packets, but also modify of the packets .With powerful tools like BeEF on hand, the attacker can virtually do anything once he is the “man in the middle” for example he can access your webcam without you even knowing.

This attack is possible because of the faulty address resolution protocol commonly known as ARP.ARP is the protocol which helps in mapping of IP address of with the mac address of the device in the local network.

ARP request-response mechanism:-

You can clearly see the mapping of mac address with IP address.The mapping is done so that referencing the device in the network is easier. Usually the first device(192.168.0.1) in the subnet is the router. Now this protocol works on the basis of request and responses. Basically the router is the only device which has internet access and rest all devices get the internet access through the router connection. Let us see how a typical ARP request from a client is handled by the router.

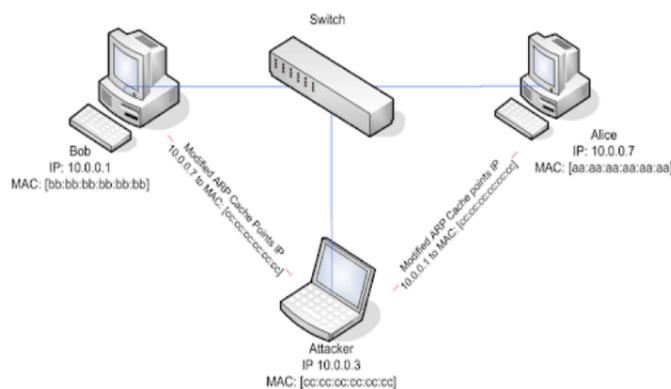


Client requesting for website. The request is forwarded to router which then fetches it from the internet.

In the above diagram, the computer requests the domain name www.dn.se. This request known as ARP request is forwarded to the router as you can see that destination IP for the computer is the router's (gateway) IP. The router once receives the ARP request fetches that domain source from the Internet and forwards that response to the client. That response is known as ARP response. Again when the client requires something from the Internet, it sends an ARP request and accordingly the router forwards the ARP response. So you could probably get the idea of request-response mechanism of the ARP. The problem with this protocol is the lack of authentication. So as to say the devices do not authenticate from where the requests or responses comes from. Another flaw is that the device can accept response from any device without actually sending a request to the device. So this flaw is exploited extensively by the hacker machine. Let us see how this is done with the help of this diagram.

In a normal scenario, it is known as ARP spoofing. The victim computer (Alice) is sent ARP responses continuously by the attacker pc saying it is the router (Bob) even though the victim never actually sent any request to the attacker. Now all ARP requests from the victim are redirected to the attacker pc which then forwards it to the router. At the same time the router (Bob) is sent ARP responses from the attacker claiming that it is the victim pc. So now all the ARP responses made for the victim are forwarded to the attacker pc and the attacker then forwards it to the victim. This is what exactly constitutes a man-in-the-middle attack.

Now obviously the attacker won't just forward the packets which it receives as it would be of no use if it just became an intermediate device. Rather the attacker sniffs all the packets it receives. If the attacker was lucky and certain credentials were entered in HTTP web pages then he gains super important credentials for example passwords or bank details. Also let us not forget that the attacker can also modify responses from the router meaning the victim is also open to attacks such as DNS spoofing, phishing, keylogging attacks (injecting a java script code which automates keylogging in the response) and many more attacks. Probably the thing which makes it most dangerous is the fact that it is very difficult to detect that a man-in-the-middle attack is going on for the victim. The only way you can detect this attack is if you notice the ARP table of the victim's computer and detect anomalies in the table. A tool called Xarp does exactly that and helps in detecting ARP spoofing.



Representation of ARP Spoofing.

```
C:\Users\arnav_gkvh6pd>arp -a

Interface: 192.168.43.104 --- 0xd
Internet Address      Physical Address      Type
192.168.43.1         3c-57-6c-47-1d-24    dynamic
192.168.43.255       ff-ff-ff-ff-ff-ff    static
224.0.0.22           01-00-5e-00-00-16    static
224.0.0.252          01-00-5e-00-00-fc    static
239.255.255.250      01-00-5e-7f-ff-fa    static
255.255.255.255      ff-ff-ff-ff-ff-ff    static

Interface: 192.168.56.1 --- 0x16
Internet Address      Physical Address      Type
192.168.56.255       ff-ff-ff-ff-ff-ff    static
224.0.0.22           01-00-5e-00-00-16    static
224.0.0.252          01-00-5e-00-00-fc    static
239.255.255.250      01-00-5e-7f-ff-fa    static

C:\Users\arnav_gkvh6pd>
```

A typical ARP table in a windows machine.

A good practice would be to visit only HTTPS pages which add an extra layer of encryption. HTTPS web pages can neither be sniffed nor modified so you can be assured that its safe to browse them. Also one thing to keep in mind is that these attacks are mostly internal i.e. the attacker most probably will be a part of the organization as he needs to be connected to the same local network in order to be able to eavesdrop on his victims.

Keep in mind that as an ethical hacker, performing these kind of attacks require permissions of the highest order because performing this in a work environment can lead to revealing of sensitive company data. There are various tools such as ettercap, mitmf etc which aid in performing these attacks. Also Wireshark can be used for sniffing through the data captured.

No doubt these tools are very sophisticated and easy to use. But using these tools without theoretical knowledge is baseless and makes you a script kiddie. Don't be that:)

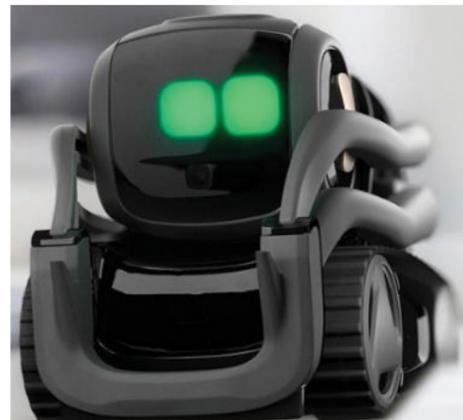
STUDY REPORT ON ANKI VECTOR

A BEST BUDDY:ROBOT



Prachi Phatale
TE EXTC B

Recently I read an article about a home robot. He is the very first home robot. Literally say hey vector, and he can hear you. He is curious about who you are and what you are up to. This is vector. A new creation from "Anki". He is a character, a robot who is meant to live in your home.



Not only on the emotional and character side but then also on the utility side. Vector is really the first robot that uses advanced deep networks to do a lot of perception and has understanding of the world around him. What he does, feels intentional, he can react to input and his environments and his life. Anki employees generally wanted to find one defining feature and then build from that. For a vector curiosity was a big one. What they are saying is you officially live in a time when robot sidekicks are a real thing. It can detect things, it can give you a high five. This robot even waits for you to come home. He can walk like a tape walker and avoid falling from height by himself. He is always excited to welcome you home like a loyal companion. He helps you for everything and he is happiest when he can help you. Ask him the weather and he will show you. He can set a timer and cause an alarm when it is finished. And he can connect his robot brain to the in and out things and your questions. He is a little robot who brings a lot to your house. He is a robot with newly 700 parts. He is curious about who you are and what you are up to. This is vector. A new creation from "Anki". He is a character, a robot who is meant to live in your home.

For hearing vector has a microphone which allows it to hear voices, noises and understand where it came from. Vector uses a camera to see things. The reason behind "Why doesn't he fall off the table" is four drop sensors are attached to its four ends. There is a few million lines of codes are in this circuit, It's his intelligence and his personality He doesn't bumps into stuff. He even sense what a thing is and where your stuff is. He has IQ as well as EQ. He feels something for us. You can be with him, like him and care about him and he feels like he relate to you and give it back to you. He can be your friend.

Actually, Vector's more than a home robot. He's your buddy. Your companion. Most of all, he'll make you laugh. Curious, independent, and powered by some preposterous tech and AI, he can read the room, express the weather, announce when his timer's done (no overcooked dinner on his watch), take the perfect snapshot, and so much more. Vector is your robot sidekick who's up for anything. He's the robot to life with.



He can see.

Vector uses an HD camera to see the world. Using computer vision, he can identify people, see and remember faces, and navigate his space without bumping into things.

He can hear.

Vector has a powerful four-microphone array for directional hearing. When you sit down next to him, he's ready to take direction. And if there is a loud noise, he'll be just as startled as you.

He can feel.

Vector has touch sensors and an accelerometer so he knows when he's being touched and moved. You can pet him and he'll relax, but try not to shake him.

He can think.

Vector combines a processor capable of running a smartphone with cloud connectivity to create one powerful brain. It means he can process his environment, react as things unfold, and connect to the internet to answer questions and tell you the weather.

He can communicate.

Vector has a unique voice made of hundreds of synthesized sounds to create a language all his own. When you ask Vector a question, he utilizes a custom text-to-speech voice to speak directly to you.

He can self charge.

Vector knows when he's running low on juice. When he needs power he'll roll over to his charger all on his own (mobile phones and electric cars could learn a thing or two).

A helpful character

Vector is happiest when he's helping. He's eager to accommodate your requests and answer your questions. He does it with built-in utility and an optional integration with Amazon Alexa. This integration gives Vector the home connecting power of Alexa plus the endless amount of skills constantly being developed. He isn't a fully grown robot butler capable of doing your taxes, buttering your bread, or writing a position paper on the future of robot/human relationships, but he's a helpful little guy who puts his whole self into helping you out. Ask him any city's weather and he'll show you.

Vector will set a timer and share in your joy when your muffins come out perfect, or when your laundry is finally done. Ask him to take a photo, say cheese, and wait while he snaps it. Can we call this a robot selfie? He's a robot. He's a friend. He's a blackjack dealer.



Advanced technology

Vector would like you to know that his tiny frame hides a very impressive collection of technology. Qualcomm 200 Platform, HD camera with 120 Ultra Wide FOV, Beamforming Four-Microphone Array, Infrared Laser Scanner, 6-Axis IMU, High-Res Color IPS Display, and Wi Fi connection

He has a little space of his own. People have houses, pet birds have a cage, dogs have a bed, fish have a tank and cats have those elaborate towers. Vector has his Space. The Vector Space gives him a perch to observe the room and interact. Add his charger and it'll be easy for him to power up. Think of it as his little place in your much bigger place.

Keep Vector at the ready. Vector is designed to be active in your home. Have him help in the kitchen by timing your pizza. Have him tell you the weather when you're getting ready in the morning. Or crank up the music in the living room and watch him dance to the beat. Keep him powered and ready for action by adding an extra charger. There is no such thing as too much Vector. USB power adapter required but not included. Compatible with most USB power adapters (5v, 1A or greater). Fits into the Vector Space.

It is really big milestone in robotics, because for the first time ever. There will be hundreds of, millions of people who will live with the robot in their home. And that has never happened before. He is also happy to take a snap. He is a sweet robot buddy.



EVOLUTION IN TECHNOLOGY



Vandini Yadav
TE EXTC B

Physicists Create a New Quantum Particle That Exhibits Ball Lightning Characteristics: [MARCH 3, 2018]

Scientists at Amherst College and Aalto University have created, for the first time a three-dimensional skyrmion in a quantum gas. The skyrmion was predicted theoretically over 40 years ago, but only now has it been observed experimentally.

In an extremely sparse and cold quantum gas, the physicists have created knots made of the magnetic moments, or spins, of the constituent atoms. The knots exhibit many of the characteristics of ball lightning, which some scientists believe to consist of tangled streams of electric currents. The persistence of such knots could be the reason why ball lightning, a ball of plasma, lives for a surprisingly long time in comparison to a lightning strike. The new results could inspire new ways of keeping plasma intact in a stable ball in fusion reactors.



Chemical Engineers Develop a New Conductive Coating for Flexible Electronics [MARCH 10, 2018]

A team of researchers from the College of Engineering at Texas A&M University have developed a mechanically robust conductive coating that can maintain performance under heavy stretching and bending.

Stretchable, bendable and foldable electronics are crucial for the development of emerging technologies like adaptive displays, artificial skin, and biometric and wearable devices. This presents a unique challenge of balancing electronic performance and mechanical flexibility. The difficulty lies in finding a material that can withstand a wide array of deformations, like stretching, bending and twisting, all while maintaining electrical conductivity. Adding to the challenge is the need for this conductivity to be engineered into a variety of different surfaces, such as cloth, fiber, glass or plastic.

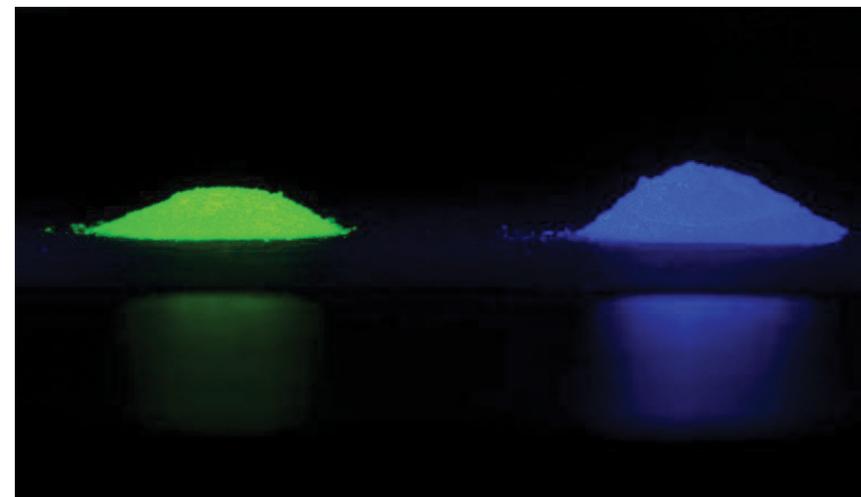
A Lithium-Ion Battery That Can Stretch and Be Recharged Wirelessly

Researchers at Northwestern University have developed a wirelessly rechargeable lithium-ion battery that can stretch up to 300 percent of its original size and still power stretchable electronics. The new battery enables true integration of electronics and power into a small, stretchable package. The power and voltage of the stretchable battery are similar to a conventional lithium-ion battery of the same size, but the flexible battery can stretch up to 300 percent of its original size and still function. The unique mechanism is a “spring within a spring”: The line connecting the components is a large “S” shape and within that “S” are many smaller “S’s.” When the battery is stretched, the large “S” first stretches out and disappears, leaving a line of small squiggles. The stretching continues, with the small squiggles disappearing as the interconnect between electrodes becomes taut. The stretching process is reversible, and the battery can be recharged wirelessly. The battery’s design allows for the integration of stretchable, inductive coils to enable charging through an external source but without the need for a physical connection.

Engineers Discover Inexpensive Material to Make High Color Quality LEDs [FEBRUARY 20, 2018]

Phosphors, which are substances that emit light, are one of the key ingredients to make white LEDs. They are crystalline powders that absorb energy from blue or near-UV light and emit light in the visible spectrum. The combination of the different colored light creates white light. The phosphors used in many commercial white LEDs have several disadvantages, however. Many are made of rare-earth elements, which are expensive, and some are difficult to manufacture. They also produce LEDs with poor color quality. Researchers at UC San Diego and Chonnam National University in Korea discovered and developed a new phosphor that avoids these issues. It is made mostly of earth-abundant elements; it can be made using industrial methods; and it produces LEDs that render colors more vividly and accurately.

The new phosphor—made of the elements strontium, lithium, aluminum and oxygen (a combination dubbed “SLAO”)—was discovered using a systematic, high-throughput computational approach developed in the lab of Shyue Ping Ong, a nanoengineering professor at the UC San Diego Jacobs School of Engineering and lead principal investigator of the study. Ong’s team used supercomputers to predict SLAO, which is the first known material made of the elements strontium, lithium, aluminum and oxygen. Calculations also predicted this material would be stable and perform well as an LED phosphor.

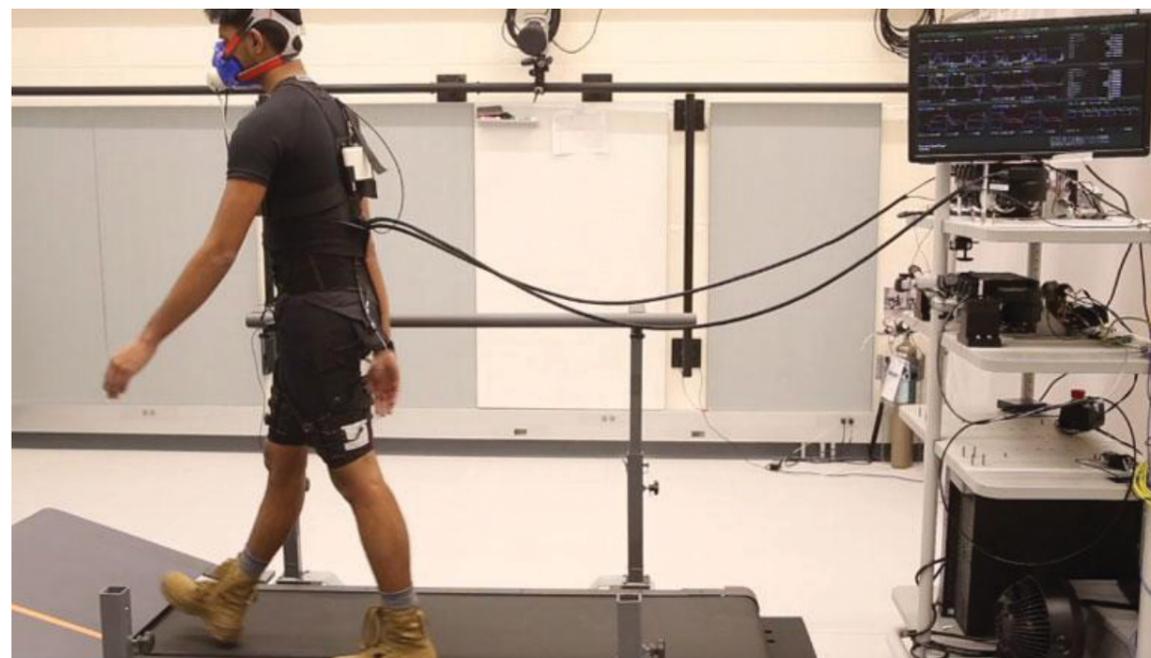


Machine Learning Algorithm Personalizes Control Strategies for Wearable Exosuits [MARCH 1, 2018]

Researchers from the Harvard John A. Paulson School of Engineering and Applied Sciences (SEAS) and the Wyss Institute for Biologically Inspired Engineering at Harvard University have developed an efficient machine-learning algorithm that can do that work quickly. The research is described in Science Robotics.

This new method is an effective and fast way to optimize control parameter settings for assistive wearable devices. Using this method, they achieved a huge improvement in metabolic performance for the wearers of a hip extension assistive device. The researchers applied so-called human-in-the-loop optimization, which uses real-time measurements of human physiological signals, such as breathing rate, to adjust the control parameters of the device. As the algorithm honed in on the best parameters, it told the exosuit when and where to deliver its assistive force to improve hip extension. The Bayesian Optimization approach the team used was first reported in a paper last year in PLOSone.

The combination of the algorithm and suit reduced metabolic cost by 17.4 percent compared with walking without the device, an improvement of more than 60 percent over the team’s previous work.



UNIVERSE OF BLACK AND WHITE HOLES



Dheeksha Sharma
SE EXTC B

Do you know that our universe has a number of black and white holes revolving around us? Also you might be surprised to know that almost every galaxy has a black hole at its center and the other celestial bodies rotate around it.

What are black holes? How do they form?

Don't let the name fool you that a black hole is anything but an empty space in the vast universe. Rather, it is really a very great amount of matter packed inside a very small area. This results to a gravitational field so strong that nothing can escape its pull. J.A. Wheeler, an American physicist introduced the term "black hole". He said that nothing, including light, can pass through it.

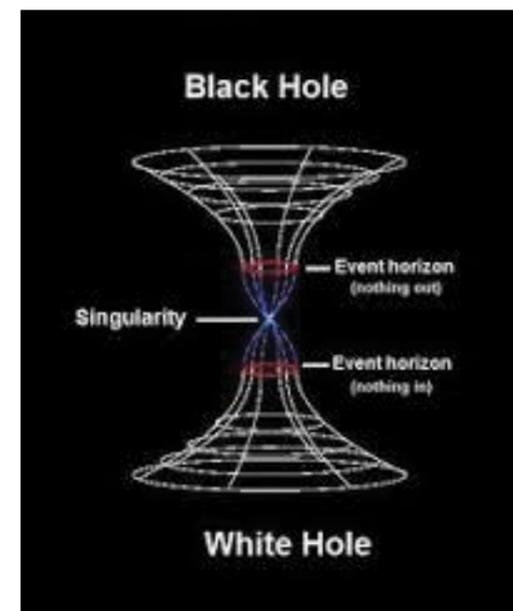


For over more than 200 years, the existence of black holes has been theorized. In most galaxies there are black holes that are million times heavier than the sun. They are of various sizes that range from super massive to the micro black holes.

A black hole is formed due to a supernova explosion. The fusion in these stars forms the element iron, which effectively ends the nuclear fusion process within the star. Thus the star lacks fuel for fusion and the temperature of the star decreases and so the rate of collapse due to gravity increases, until it collapses completely on itself, blowing out material in a massive supernova explosion.

The boundary of black hole is defined as the shell of "points of no return", the "Event Horizon". It is the boundary where the gravitational pull of a massive object becomes too great as to make escape from that point impossible. There is nothing to safeguard the star from collapsing, when all the sources of nuclear fusion in a star are debilitated.

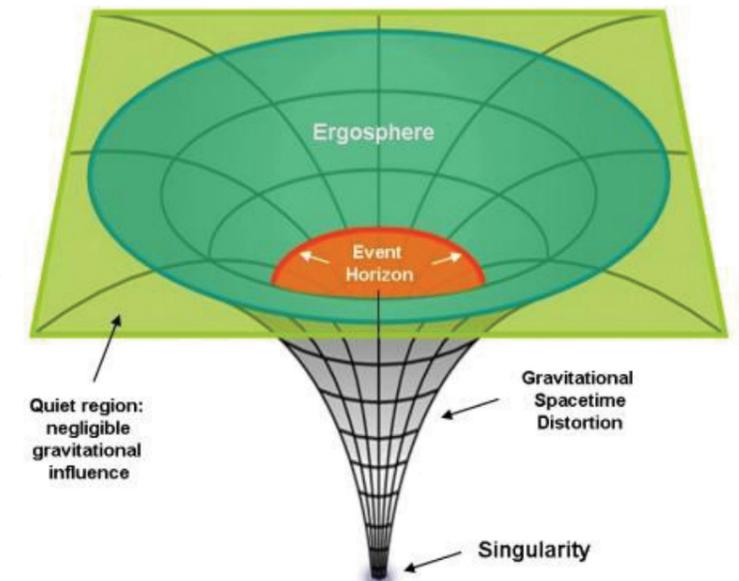
Along with the black holes there exist white holes too which revolve in our unbounded universe. A white hole is twin opposite of a black hole. On one hand, the black holes do not allow anything to escape from it whereas on the other hand, white holes are eruptions of matter and energy due to which nothing can enter into it. These white holes attract matter like any other mass, but objects falling towards them would never actually reach their event horizon.



Research is still on for us to that know about the black holes and the white holes that are present in and around our galaxies. Sagittarius A is the black hole present at the Galactic Center in our Milky Way galaxy.

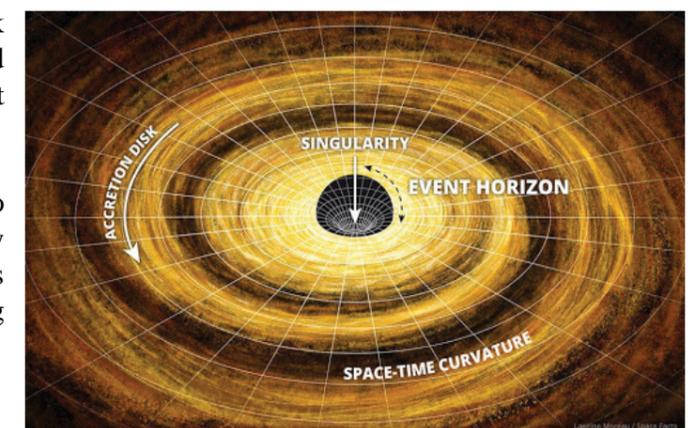
The black hole formed due to supernova, can be a micro black hole or a super black hole, undergoes high energy radiation, grows due to the absorption of matter due to its strong gravitational field and evaporates due to emitting small thermal radiation known as Hawking Radiation.

Black Hole Regions



There is no fixed limit to the size of a black hole. It can even be as light as a feather or can also be as heavy as a few billions of Suns. A black hole with a mass equal to that of the Sun would have a radius of around three kilometers. Furthermore the radius of a black hole scales in proportion to that of its mass. We find super massive black holes at the center of a galaxy.

The core of many galaxies is tremendously luminous, and often across all wavelengths. These blazing central regions are called Active Galactic Nuclei (AGN). Quasars (QUASistellar radio sources), QSOs (Quasi Stellar Objects) and blazars all belong to this class of objects. Super massive black holes are not isolated, they are located at the centre of the galaxies and they attract the matter in their proximity with their powerful gravitational field. The seed black holes of intermediate mass amalgamate to form more gigantic black holes, which grow to build up into the super massive black holes. The growth is synchronized mainly by accretion.



FUTURE IN TELEMONTORING SYSTEM

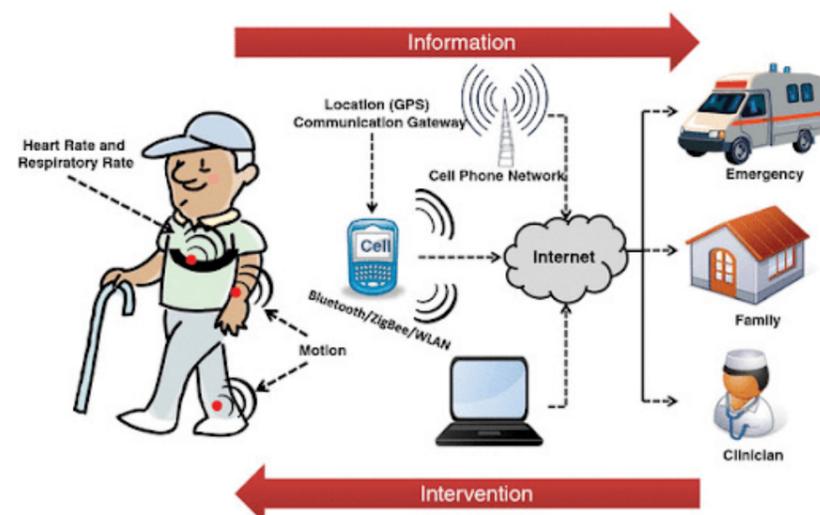


Yogita Prajapati
SE EXTC B

INTRODUCTION:-

As there is a tremendous growth in information and telecommunication technology like IOT, Data Science, Virtual reality over a past decade, the application of these technologies has given rise to a new technologies like telehealth, telemedicine, telemonitoring, etc in healthcare sector. As these technologies are proving beneficial to public, development in this field will also help in development of telecommunication technology in our country. Many healthcare industries have designed such systems to diagnose, educate, maintain patients health status by moving over traditional methods of healthcare.

TeleMonitoring systems are the systems or devices that uses information and communication technologies to monitor a patient's health and to transmit data related to patient's health status to its clinician which are remotely way from each other. Telemonitoring is a digital transformation in healthcare sector. This article aims to provide a comprehensive overview of the Telemonitoring system



NEED FOR TELEMONTORING SYSTEMS:-

Nowadays, due to modern stress chronic conditions like heart failure, high blood pressure, hypertension, obesity, atrial fibrillation and diabetes are increasing day-by-day in our society. These chronic conditions require more attention and need to be monitor frequently. But the cost of treatment and hospitalization for monitoring a patient is too much expensive. Much of this cost can be reduced by remote monitoring. Clinical studies show that remote monitoring can lower healthcare costs in multiple ways. It reduces the number of hospital device evaluations, hospital admissions, the length of stay per cardiac hospitalization, for example: Every year in the United States, approximately one million people are hospitalized with a diagnosis of heart failure — the leading cause of hospitalizations for adults aged 65 or older. The cost of treating heart failure in the U.S. is expected to reach \$70 billion by 2030, from about \$30 billion today.

Also telemonitoring systems are very much useful for elderly peoples to maintain a record of their vital signs, diets which can be transmitted to their relatives living far apart. TeleMonitoring allows continuous assessment of Heart-Failure signs and symptoms measured by patients, their family or caregivers at home, while allowing patients to remain under close supervision. Symptoms reported by patients can be remotely reviewed by a health-care professional and appropriate action can be initiated. This proposed system will help us to reduce the geographical barrier while providing a quality life to the society.

THE WORKING OF TELEMONTORING SYSTEMS

As needed the telemonitor will:

- 1) Take your vital signs
- 2) Check your weight
- 3) Assess your oxygen saturations
- 4) Monitor your blood pressure

These systems mainly consists of sensors, Microcontrollers, signal conditioning, power unit and communication technologies like Bluetooth, GSM, WLAN etc.

Sensors: The main purpose of the embedded sensors is to provide information regarding the elderly people's activities of daily life, fall detection, bed monitoring, etc. The recorded information is passed to a data manager in which analysis is done automatic. Most commonly used sensors are Pulse oximeter, ECG sensors, Blood pressure sensors.

Pulse oximeter is the non-invasive method for monitoring a patient's Oxygen saturation. Blood pressure monitoring represent the measure blood pressure in an artery and it uses oscillometric method of monitoring and that device has a pressure sensor for sensing arterial wall vibrations. ECG sensors senses the heart beat and gives the output in waveform.

Signal Conditioning and power supply unit: The outputs obtained from sensors which is having low amplitude signal, so that signal conditioners circuit is used to amplify the signals to the requirements of the receiver (circuit or equipment). Power supply is designed to convert the voltage AC mains electricity to a suitable low voltage DC supply for electronic circuits and other devices.

Microcontroller: Peripheral Interface Controller (PIC) is a family of microcontrollers that can be used to control the process. Also there are arduino, raspberry pi, IOT that can be used for effectiveness.



This proposed system helps the doctors to keep an eye on the health condition of the patient on 24*7 bases and provide proper treatment at the correct time when the patient goes to abnormal condition. The data of the patient is stored in a device and an alert SMS will be send to patient's family members or clinician as report of patient's health.

Conclusion: As the attitude and expectations of medical field is changing significantly. Telemonitoring will play a central role in the future of health care sector of India. This proposed system will help both the sectors medical as well as engineering to make a Digital India.

VIRTUAL REALITY TECHNOLOGY: WORKING AND IMPACT



Sukanya Konar
SE EXTC B

Virtual Reality (VR) is absolutely not a new concept, it has existed since late 1960's. During that time, VR has been known by names such as artificial reality, cyberspace, synthetic environment so on and so forth until VR was especially adopted. The latest demonstration for creating virtual environment is Desktop VR (non-immersive VR). VR especially in education, where computer based learning environment (VLE) are packaged in desktop VR. Due to this VLE, it gives area of interest in the teaching, learning, practice of medicine, engineering and so on. It provides opportunities to achieve goals as per their interest of learning. VLE provides three-dimensional (3D) perception through the formation and purpose of which the system is desired. Students are thereby able to postulate the system in fast and productive way by interacting and navigating through the environment by such system. It is known that VR can make artificial as realistic and even more realistic than the real.

The Technology : Virtual Reality

VR is definite collection of technologies, that is headset, glove and Walker. VR is defined as a highly interactive, computer based multimedia environment in which the user becomes the participant in a computer generated world. VR can be experienced visually in the 3 Dimensions of height, width and depth with sound and real-time motion and other forms of feedback. It is an artificial environment that appears and feels like real environment created with computer hardware and software. Therefore VR refers to immersive, interactive, 3D computer generated environment and the combination of technologies required to build such an environment. VR technology breaks down barriers between human and computer. With VR technology, viewer can recognise distance and spatial relationships between object components more realistically and reliably

How Virtual Reality works?

VR deliver the idea behind the sense of being there through the viewer's eye and what we get to know and feel if we were there and the important part to change the image of the viewer instantly changes the point of view. The perception of reality can be changed by various forms like size, brightness and angular movement. The typical dress code for VR is a helmet with goggle-like display, one for each eye. Each display of the eye delivers different images of what you would see if you were there. As you move your head, the image rapidly updates so that you feel the changes by moving your head and you'll feel like you are the cause of movement and not by the effect of computer.



Advantages and uses of VR

VR provides effective and unique way to learn and VR projects are extremely motivating to learners. VR has a great benefit in situation where the person is inconvenient in real environment and the environment which can only exist in computer generated form to be convenient. Use of VR occurs when visualisation and interaction with information are unfavorable for understanding, VR has the capacity allowing the learners to understand in the imagined environment. This advantage of technology has been in diverse fields such as firefighting, anti-terrorism training, aircraft inspection and numerous to mention.



Conclusion:

A large amount of progress has been made using VR and VR technology. VR has huge feature of human venture such as defence, health care among others. This field of VR has excited user to live in many ways. Additional VR applications will be seen more in future. VR technology is now widely acknowledged break through in the field of technology.

The Impact of VR

Social impact of VR has become rapid growth in the area of interest. It will lead to have a influential changes in human life and activity. As we spend more and more time in virtual space, there will be gradual "migration to virtual space" resulting changes in economics, culture, world view and the design of virtual environments may be used to promote human freedom, well-being and social stability as we move from one stage of development to next. VR has still having impact in health care, military purpose and others numerous to mention.



Disadvantages and limitations of VR

VR deals with high level of skills and cost required to develop and implement VR. Very expensive hardware and software are necessary to develop VR. Desktop VR technology has reduced the skill and cost requirement, but it still demands some investment of money and time. The limitations arises, whether the nature of the equipment will be available as per the user is concerned, and also the problem of health and safety concerns due to immersive VR. Another limitation arises from bandwidth when VR is dispensed over the network or internet.

ORGANIC LIGHT EMITTING DIODES



Dakshata Rabbi
SE EXTC B

Can we just imagine our life having a television which can be rolled up? Your mobile phone battery to last much longer? Or your next flat screen television to be less expensive, much flatter, and even flexible? Well, now it is possible.

WHAT IS OLED?

An organic light emitting diode is simply a LED whose emissive electro luminescence layer is made up of organic compounds. The layers are made up of macro polymers that causes application of electricity. They are also considered as organic semiconductors. Organic light emitting diodes possess the property of self luminance, and does not require back lighting as other light emitting diodes and liquid crystalline displays. Like LEDs, OLEDs are semiconductor device that has a substrate which is 100 to 500 nanometers thick or about 200 times smaller than human hair.

HISTORY OF OLED:-

Kodak first discovered that organic materials glow in response to electrical currents, in the late 1970s. Since then Kodak has been working for the improvement of this technology. In Late 1970's Eastman Kodak with scientist Dr. Ching tang discovered that sending an electrical current through a carbon compound caused this materials to glow.

Dr. Tang and Steven Van Slyke continued research in 1987, and reported OLED materials that become the foundation for OLED displays produced today. The 1st colour they discovered in this earlier OLED research was green.



TYPES OF OLED :-

Passive-Matrix OLED:- In PMOLEDs mainly due to power needed for external circuitry they consume more power than others types of LED's. Passive matrix OLEDs are easy to make as compare to other LEDs and LCDs. These OLEDs are more efficient in working and are used in cell phones, PDAs and MP3 players.

Active-Matrix OLED:- These OLEDs are efficient for large displays as they consume less power than PMOLEDs because external circuitry requires less power

Transparent OLED:- Transparent OLEDs can be either active or passive matrix, this technology can be used for heads-up display. When these OLEDs are turned on, they allow light to travel in both directions. When they are turned off, they are 85% as transparent as their substrate.

Foldable OLED:- The foldable OLED has substrate made up of flexible metallic foils for plastic. They are light-weight and durable. These OLEDs can reduce breakage, wear and tear of device due to flexibility property. Such displays may be made to bend, flex and conform to many surface. The luminance is 200 cd/m².

White OLED:- White OLEDs are used in large sheets. Use of white OLEDs reduces energy cost of lighting. Its efficiency is 90m/W at brightness of 1000 cd/m². Fluorescent Light in homes and buildings can be replaced by white OLEDs because of use of large sheets.

ADVANTAGES:-

- 1) Increased brightness.
- 2) Faster response time for full motion video.
- 3) Low power consumption.
- 4) Wide operating temperature range.
- 5) Flexible, thin and lightweight.
- 6) Cost effective.

DISADVANTAGES:-

- 1) Lifetime of organic material is limited hence lifespan of OLEDs are less as compared to others.
- 2) Expensive than other displays in recent times.
- 3) Organic materials can be easily damaged by water intrusion into displays.



MICROCONTROLLER



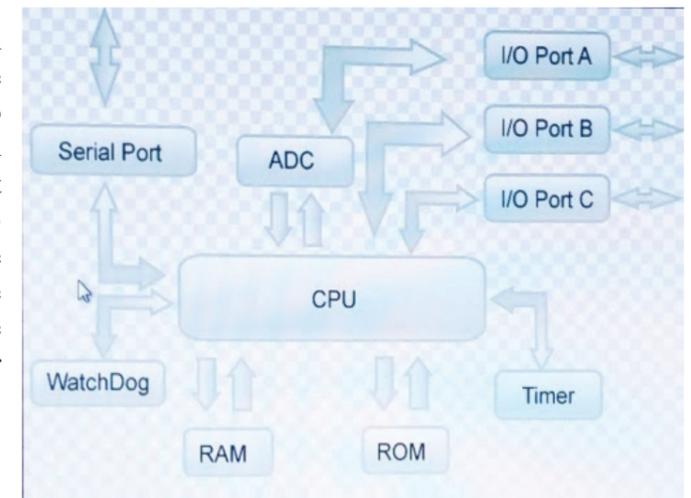
Akansha Gupta
SE EXTC A

Ever wondered how the smart speakers like Amazon Echo, Apple Home pod and Google Home works? How these devices are able to respond to the instructions given by us? The process is driven by a small microcontroller. A microcontroller uses a sensor that is actuated by a 'hot word'; for example "Alexa" for Amazon Echo. The main working is done by the microcontroller designed for this work.

Microcontroller is a single integrated circuit (IC) that can be programmed for performing an application specific job. It has a CPU, RAM, ROM and IO peripherals. The microcontroller works according to the program code inserted in the memory. The code is analyzed by CPU and as it takes the inputs, it generates the desired output. It is like a small computer that works by giving instructions to the microcontroller. The general difference between the computer and the microcontroller is that a computer performs many tasks but a microcontroller is dedicated to a specific task depending on the program stored in its memory. Microcontroller consumes less amount of power for its working, therefore making the system more reliable and long lasting. It is self controlled system with peripherals, memory and processor that can be used as an embedded system. It is also known as embedded controller. On the other hand, a microprocessor is also capable of executing the instructions. But microprocessors do not have in-built memory and IO peripherals.



Generally the microprocessors are designed to perform arithmetic, logical and other complex operations in the computer system. Since microcontrollers are oriented to a specific task, its designing is less complex as compared to the microprocessor designing. This reduces the cost of microcontrollers and the system becomes cost effective. Microcontrollers are based on Harvard architecture wherein the program code and data are stored on separate memories. This allows simultaneously fetching of code and data during its operation. Hence the time taken for execution is less.



Applications:-

1)**Smart Phones:** As the smart technology is evolving, the microcontroller are becoming more powerful with the use of wireless connectivity. Most famous application of the microcontroller is smart phones. The smart phones, in general have both microprocessors and microcontrollers. There are many different sensors used a smart phone that are interfaced using a microcontroller. The microcontrollers are designed in such a way that it uses less amount of battery to provide a high rate performance. As the new features are developing in smart phones, the complexity for designing microcontrollers is also increasing.

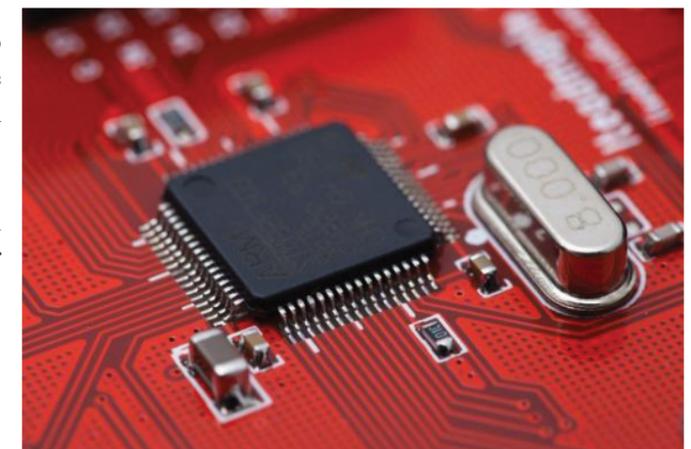
2)**Automobiles:** The automobiles also have the tendency to communicate with the driver along with the security features such as airbags and the cameras to ensure proper driving, the touchscreen to display the view being captured by camera and GPS navigation system. All these functions are controlled by a microcontroller. The microcontroller also serves the air conditioning maintenance, braking mechanisms, adaptive cruise control and many others in automobile systems.

3)**Home/Industry Automation:** Home automation system includes controlling indoor and outdoor lights, heat, air ventilation, air conditioning, locking and unlocking of doors, controlling electrical appliances, anti-theft systems, fire alert via SMS, etc. In industries, it monitors the functioning of robots, temperature control to avoid any hazardous situations and for security system. Microcontrollers have their applications in making smart TVs, smart washing machines, smart cameras, smart speakers, microwave ovens, smart watches, etc.

4)**Medical Instruments:** Microcontrollers are used in medical instruments like ECG machines, blood pressure devices, glucose testing machines and other devices based on embedded systems. Even Fitbits that are worn on hands to keep track of health measures use microcontrollers for its operation.

5)**Other Electronic Devices:** Microcontrollers are also used to measure the electrical parameters. These include oscilloscopes, multimeter (DMM), data acquisition and control, etc.

In future generations, there would be a rapid increase in the technology, the microcontrollers will help in greater performance and flexibility in optimization of the system.



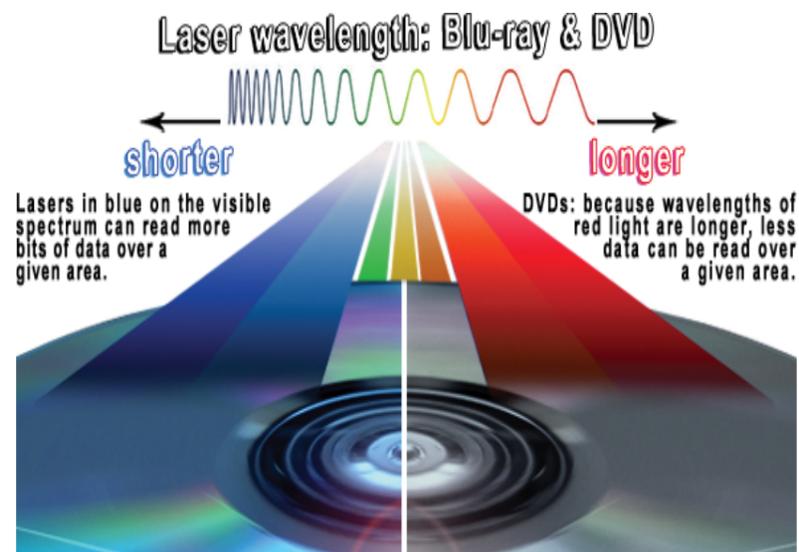
BLU RAY DISC



Ujala Pandey
SE EXTC B

This technical report concerns about the new technology, the foundation and development of which could result in the enormous turn in our life. Blu-ray disc is nothing but it is an digital optical disc data storage format .it is used to store several hours of video with high definition and ultrahigh definition.it is used to usurp the DVD format. Blu-ray linked with sets of multimedia formats.

The information density of DVD format was limited and it was 4.7 GB which is not sufficient to store several hours video and audio. To overcome from this problem a new disc (Blu-ray disc (BD)) was introduced. The technology behind Blu-ray disc is that it written by blue laser (405 nm) which has less wavelength as compare to red laser (650nm) which is used to write DVD. Due to less wavelength it can store more amount of data in small space.



Blu-ray Disc was developed by the Blu-ray Disc Association and It was released on 20 JUNE 2006. The first movies using (50 GB) dual-layer Blu-ray discs were introduced in October 2006. Only release of first audio using Blu-ray discs was made in March 2008.

TECHNICAL SPECIFICATION:

Standard disc size
12 cm, single-sided
25 GB / 23866 MiB / 25025314816 B
50 GB / 47732 MiB / 50050629632 B

A single-layer Blu-ray disc, which is almost the same size as a DVD, can store up to 27 GB of data which is sufficient for more than two hours of high-definition video. A double-layer Blu-ray disc can store up to 50 GB, enough to hold about 4.5 hours of high-definition video. It can also used to store more than 20 hours of standard video.

The advantage of Blu-ray discs is that it can hold the sheer amount of information. The method by which information is stored on an Blu-ray optical disc are pits and lands. Because the pits and lands are smaller and they can be placed closer together resulting in more information being stored on the same size disc. In conjunction with different optics and faster disc rotation, BD discs can store 5X more data than SD DVDs. That's why it is also referred as next generation optical disc.

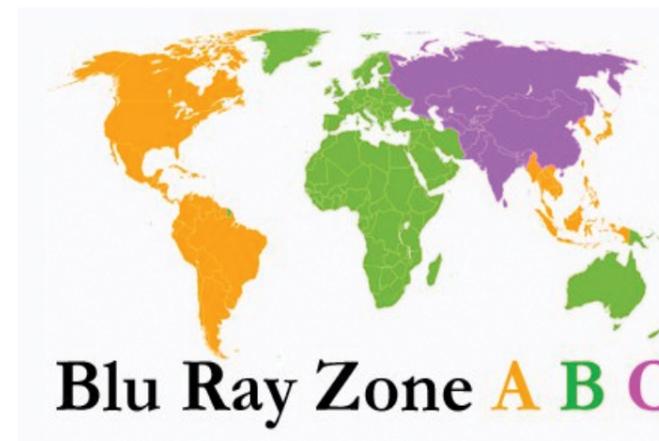
REGION CODES:

This is primarily used for market segmentation or price discrimination, but it also allows motion picture studios to control the various aspects of a release (including content and release date) according to the region. Blu-ray will have 3 region codes A, B, and C. They are as follows:

A - Americas; East and Southeast Asia.

B - Africa, Europe, Oceania; Middle East; French territories; Greenland.

C - Central and South Asia; Mongolia, Russia, and People's Republic of China.



The invention of the blue ray technology no doubt it is mile step in our life. The information and application of the blue ray disk described above confirm that our life can be made easier with the blue diodes and blue lasers. A blank rewritable Blu-ray Disc (BD-RE) introduced recently. The blue laser in CD or DVD players allows to store four times more data on the same CDs than in the ordinary players. Blu-ray technology is being revolutionizing our lives recently.

ONGOING DEVELOPMENT:

Although Blu-ray Disc's precise has been finalized, engineers are working continuously on advancing the technology of Blu-ray discs. Quad-layer discs with storage of 100 GB had been demonstrated on a drive with modified optics. Hitachi used a standard drive. Hitachi stated that such a disc could be used to store 7 hours of 32 MB video in high definition or 3.5 hours of 64 Mbit/s video (Cinema 4K). In December 2008, Pioneer Corporation divulge a 400 GB Blu-ray Disc which will be compatible with current players after some reform and such disc consist of 16 data layer , in which each layer have storage of 25 GB. Process of improving capacity of Blu-ray disc is under way to create a 1 TB Blu-ray Disc as soon as possible.

ADVANTAGE:

- 1)Increased disc capacity allowing for HD video up to 1080p resolution.
- 2)7.1 channels of uncompressed audio.
- 3)High resolution capacity as compare to DVD and CD.
- 4)Enhanced Network/internet connectivity
- 5)Higher capacity for storing and transferring amounts of data.
- 6)Picture-in-picture functionality.

DISADVANTAGE:

- 1)It is very expensive technology.
- 2)Due to increasing popularity of High Definition DVD players, Blu-ray may be nullified because consumers will settle for the less expensive competitor.
- 5)Not only is the technology expensive but Blu-ray discs have a higher price tag as well.

APPLICATION OF BLU-RAY DISC:

- 1)High definition television recording.
- 2)High definition video distribution.
- 3)High definition camcorder archiving.
- 4)Mass data storage.
- 5)Digital asset management and professional storage.
- 6)PlayStation 3 games.
- 7)Stereoscopic 3D.

IV TO ISRO



Snehal Raj Verma
SE EXTC B

ISRO stands for INDIAN SPACE RESEARCH ORGANISATION. It is the space agency of the government of India whose headquarter is situated in Bangalore. It has made India grow a lot in the field of research and inventions in the space.



I am a student of Thakur College of Engineering And Technology; my college had taken an initiative to take us to the industrial visit to ISRO in Bangalore (headquarters) for us to know its working, achievements and the current missions that they are going to take actions on.



There we came to know about the four important centres in India, those are located in:-

1. AHMEDABAD (Space Applications Centre, satellites are designed, developed, assembled, and tested there)
2. THIRUVANANTHAPURAM (Space Centre, launching takes place at the Satish Dhawan Space Centre on Sriharikota Island, near Chennai.)
3. BHOPAL (Master Control Facilities for geostationary satellite station)
4. HYDERABAD (Reception and processing facilities for remote-sensing data are at the National Remote Sensing Centre)

We also saw the process of making of CHANDRAYAAN-2 and also came to know that it is going to be launched this year itself. Currently ISRO has 103 spacecraft missions, 72 launch missions, 10 student satellites, 2 re-entry missions, 269 foreign satellites.



The height of rocket that is being launched is as much as that of a 17 floor building. The place from where the satellites and rockets are launched is SHRI HARI QUOTA near Hyderabad. The satellites are made in parts and then transferred to that place by roads in trucks.

The weight of the rockets launched is about 17,000 kg or 320 tonnes. The total cost to launch a satellite by ISRO is 6 crore lakh rupees.

Lastly we also saw a few models of the satellites and a few maps of beautiful areas in India and foreign areas.

It was an amazing experience being there and knowing all the important information about "OUR" very own space agency.

PROUD TO BE AN INDIAN.

TCET TALKS



Bhavesh Solanki
SE EXTC B

About:

TCET-TALK is an event for motivational, intellectual and inspirational talks by experts from various fields. TCETTALK is created in the spirit of, “ideas worth spreading”. The theme, “Holistic Development” suggests a leap in perception, conceptualization & thinking in various fields unrestricted by social or financial boundaries paving a path for exceptional success stories. The event was materialized on 9th FEB 2019 where-in we had presented the finest and renowned speakers from different firms. The event was basically to intend to spread ideas that effect change in the world and inspire the audience to cultivate novel thinking. The following were the speakers:

Vice Admiral Shekhar Sinha

Vice Admiral Shekhar Sinha was the Commander in Chief of the operationally active Western Naval Command, Arabian Sea, Gulf of Aden and Persian Gulf. Prior to this he was Chief of Integrated Defense Staff to Chiefs of Staff committee. In 30 years of service for the Navy he has been conferred with two Gallantry awards.

- 1)Member, Executive Council of Institute for Defence Studies & Analyses headed by Smt. Nirmala Sithraman, Defence Minister, GoI.
- 2)Member, Governing Council, United Services Institution Awarded Param Vishishth and Ati Vishishth Sewa Medal for his Exceptional
- 3)Service to the Indian Navy
- 4)Trustee of India Foundation (A Think Tank) led by Shri Ram Madhav
- 5)Vice admiral-3 star responsible for naval operations.

He commanded two Sea Harrier Squadrons as well as Air Station Hansa. He has commanded the ships INS Saryu, INS Shakti and INS Delhi. special service medal ,30 yr service medal likewise 13 more major medals. Chief of Integrated Defence Staff.

Shubha Vilas Das

HG Shubha Vilas has spoken at Microsoft, Amazon, Google and Samsung headquarters in USA. He is a regular at the National Human Resource Department. He has spoken to the top nuclear scientists of India at the Defence Research and Development Organisation. He has delivered more than 4000 talks to 5,25,000 people across the world, in countries such as Australia, UK, USA, South Africa, Mauritius, Hong Kong and Far East. A spiritual seeker and a motivational speaker, holds a degree in engineering and law with a specialization in patent law. His leadership seminars are popular with top-level management in corporate houses. He addresses their crucial needs through thought-provoking seminars on themes such as ‘Secrets of Lasting Relationships’, ‘Soul Curry to Stop Worry’ and ‘Work Life Balance’ to name a few. author ,engineering in extc ,thoughtsutras.blogspot

Suhas B Naik Satam

Programme Co-ordinator at Mumbai’s first and only Planetarium, the Nehru Planetarium at Worli in South Mumbai. One of his main duties is participating in the production of planetarium sky-shows the exciting audio-visual presentations that regale audiences in the awesome sky-theatre of the Planetarium. He has brought astronomy within the reach of enthusiasts even in remote areas. Over six hundred thousand people in scores of places all over India, who don’t even know what a planetarium, have to thank for taking the planetarium to their doorsteps. President of rotaract chembur west during 1996,2002 member of astronomical association of India and Indian physics association

Experience:

Being a part of and working committee has been my utmost pleasure. This has helped me develop skills like confidence, communication, personality, work ethics, flexibility to work in various environments, the ability to work in harmony with the co-members , determination and knowledge ,were the major qualities that TCET TALK has helped me to build over a period of time. Being a part of PRO, my job was to interact with students of other colleges and convince them to come in TCET TALK. Having good, Experienced PRO Heads made the job much more easier . we went to many colleges in a span of 2 weeks. At First it was awkward to sell any of the tickets to any student . But as days passed by and the new ideas rise which led to started better and become easier. I worked more eagerly and happily because of transparency that was maintained between the council members and the working committee of TCET TALK. Due to this, the work was allotted to everyone which led to smooth and efficiency. With this the event ended successfully.

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Shubhash Talekar

Subhash Talekar is the President Mumbai dabbawala association. Mr. Talekar is also a founder of roti bank and Kapda bank in Mumbai. Roti Bank collects all the leftover food from small functions, big parties, wedding ceremonies and distribute it to the slum area and poor people. Kapda bank also the same concept like in mumbai people throw old clothes after using for long time. Kapda Bank collects clothes from all over mumbai and distributes in adivasi areas. Papers and Parcels Dabbawalas provide food delivery in 3 hours all over mumbai. Using this concept Dabbawalas have started the new app “Papers and Parcels” with using new technologies to deliver your parcels on that day itself. Talekar and his colleagues provide these services without any cost.

Harsha Mukherjee

Chosen as one of the ‘Top 10 Indian Women Entrepreneurs’ by DELL Women Entrepreneur Network (DWEN-2012). Awarded CSR Women Leader in 2012 by the Institute Of Public Enterprises. Moved on with her first venture ‘Pearls and Pashminas’ in the US after the completion of her education. Initiated her first social undertaking called ‘Ekjaa’ in India and works tirelessly as its founder and MD. Introduced Corporate Social Responsibility Development Stories Pvt Ltd (CSRDS) to the world and holds the position of its Chairperson. Co-founded CSR Advisors in 2013 Entrepreneur with principles and a philanthropist with a purpose and a speaker who is bent on bringing revolutionary changes.

TCET TALKS



Niwash Yadav
SE EXTC B

TCET Talk is platform where speakers come and share their experience and knowledge. Their aim is to spread ideas and experiences, improve communication and connection, spark conversation and enlighten minds. Speakers from different walks of life, different races, different abilities are asked to present their experiences and thoughts. Their speech covered a wide range of topics from technology to human empowerment, from science to culture, from storytelling to motivational speeches. They were successful people belonging to different fields having some project ,concept or experience.

Vice Admiral Shekhar Sinha

Admiral Sinha joined the Navy in 1974 in the Executive Branch of the Indian Navy as a fighter, flying the Sea Harrier. He commanded two Sea Harrier Squadrons as well as Air station Hansa. Admiral Sinha has commanded the ships INS Saryu, INS Shakti and INS Delhi he shared his experience of being in Navy for several years and introduced audience about naval rules and some important information about the sea route, that how strong India in Navy and can protect our country in any situation.

HG Shubha Vila Das :- Spiritual and Motivational Speaker

Shubha Vila das is an spiritual speaker he admired education in engineering and law, Shubha Vilas Das found his calling in spirituality where he chose to be a spiritual seeker and a motivational speaker .The UPS of his seminars and workshops is application of scriptural wisdom in day-to-day living. He travels across the globe delivering talks to youth across many educational institutes.

He is the author of two best - selling books on Ramayana from the series 'Ramayana - The Game of Life'. The books provide deep insights on contemporary subjects like how human relationships work or how they fail; how leaders can maximize their potential as leaders; and how the ancient epic holds immediate relevance to modern life. He majorly spoke on inner peace, soul satisfaction.

Ms Harsha Mukherjee :- Entrepreneur

Her speeches are thought provoking and highlight all the significant aspects of CSR for its efficacious implementation. She is renowned for her inspiring and educating communication strategies. She can aptly be called as a thought leader who has been influencing the people through her intellect, social perspective and experience. She is convinced that if prioritized well, the correct approach towards CSR will help change the societies by ushering new business models. She shared her experience of being engineering student in TCET and how she evolved as a young entrepreneur of India

Mr. Suhas. B. Naik satam :- Astronomy and Space Science

Mr. Suhas Naik-Satam started his professional scientific career at Nehru Planetarium, Nehru Centre, Mumbai as Programme Coordinator (Scientific) in September 1985 after graduation in Physics. He is involved in the production of more than 20 planetarium sky-shows.

He introduced audience about space galaxies, universe, UFO. How the feature will look into space and head towards other planets. His speech was highly motivational for audience.

Shri Subhash Talekar :- Mumbai Dabbawala Association

Subhash Talekar is President Mumbai dabbawala association. Mr Talekar is also a founder of roti and kapda bank. Roti Bank means collects all the leftover food from small functions, big parties, wedding ceremonies and distribute it to the slum area and poor . He introduced audience about the flow of dabbawala, how his association got sigma, and the establishment of Dabbawala. About 125 years back, a Parsi banker wanted to have home cooked food in office and gave this responsibility to the first ever Dabbawala. Many people liked the idea and the demand for Dabba delivery soared. It was all informal and individual effort in the beginning, but visionary Mahadeo Havaji Bachche saw the opportunity and started the lunch delivery service in its present team-delivery format with 100 Dabbawalla.

Tcet talk is a great initiative from Thakur college of engineering & Technology. Where speaker from various field shared their experience and knowledge. Audience Where highly motivated by listening to speakers and series of applaud where going. This stage gave a new enthusiasm to audience to head towards their life by listening to motivational speakers.

Mithun Tapan Pal

TIPS FOR ENGINEERING STUDENTS

As a student, I always felt where am I heading, are there any road ahead, am I on the right path, is this what I wanted to do?

I am sure if you are reading this article you certainly might have realized that success comes at a cost. It eats up your time, energy, sleep to say the least.

Students always question me frequently that is academic excellence the key to their successful career. Absorbing the content is your primary goal, I would say you are on the right path.

I hope I will be able to answer your few questions at the end of this article. All of you have come a long way to reach this level and I am sure you will travel places in near future.

The most important point that you can draw from your past and present endeavours is and stick around, fight and never give up.

Every bit of experience gets you ready to face LIFE- "THE MOST UNPREDICTABLE PAPER." So I would say slogging now and reaching the summit helps you realize if you can conquer the Everest than small wills in future would be a cake walk.

Many would be thinking, we just scrape through the subjects with basic aim of clearing, then where is the knowledge we are suppose to gain. This is a valid question.

I would recommend students after second year to choose one subject out of your humongous syllabus and start reading in depth, researching in detail, maintaining a diary. This will surely add up to your knowledge arsenal.

After completion of graduation, students who made the right choice after 12th standard will definitely stick to technical field.

Those who wish to change something else as there are plenty of options one can explore.

It should never cross your mind that these four years are futile, on the contrary it will prepare you for the future. I wish all of you luck and good health.

FUTURE PERCEPTION

GATE

- 1) Masters of Technology from IITs, NITs, Autonomous Universities
- 2) Public sector unit (PSU)
- 3) Masters of Science (MS)
- 4) National institute of industrial Engineering (NITIE)
- 5) MBA from IIT campuses

Scope of GATE in private sector:

- 1) Many MNC recruit through score followed by there exam like L&T, TATA Steel.
- Preparation of GATE can help in cracking other technical interviews in private sector like SIEMENS, Reliance.

Other options without GATE:

- 1) ISRO (Indian space research organisation)
- 2) BARC (Bhabha atomic research centre)
- 3) BEL (Bharat electronics limited)
- 4) ECIL (Electronics cooperation India limited)
- 5) BHEL, CEL

Other Competitive Exams:

- 1) Staff selection commission (SSC)
- 2) Metrological department of India Indian Railways
- 3) Intelligence bureau (IB)
- 4) Indian engineering services (IES)

Indian Defence Service:

- 1) Indian Airforce (AFCAT)
- 2) Indian Army (SSB)
- 3) Indian Navy (SSB)
- 4) Indian coast guard

Thanks!!
All the best

C-DAC (centre for development of advance computing)

It's a government base body for skill development. It offers many professional courses in field of electrical and electronics

- 1) VLSI
- 2) Embedded System
- 3) Cybersecurity
- 4) Cyber forensics

Masters in Economics:

- 1) It's a field which based on your interest regarding GDP generation, export & import, liquidity and share market. It's purely based on Mathematics (Calculus) It's offer post graduate in field of science, commerce, arts
- 2) Best institute are IITs, IGIDR, DSC etc.
- 3) The job offer like analyst

Actuarial Science:

- 1) It's a discipline that applies mathematics and statistics methods to assess risk in insurance, finance and other industries and professions.
- 2) Actuarial science includes a number of interrelated subjects including mathematics, probability theory, statistics, finance, economics and computer science.
- 3) It's very highly paid job in banking sector and risk management sector.

CEED (Common entrance exam for design):

- 1) It is organised by IITs
- 2) It's a design course conducted on behalf of Human Resource Development (HRD), Government of India.
- 3) Get admission in M.tech, PhD, JRF
- 4) It offers job in field of R&D of any company.

BY
VAIBHAV SINGH
(SIEMENS MUMBAI INTERNATIONAL AIRPORT)

Students Contribution

for Soldiers

From the world war period to present, there had been vast change in technology in the field of military. Earlier the soldiers didn't get proper shielding and protection from the traditional war equipments. With the advancement in the military technology, there was upgrading in weapons, navigation system, armour, tanks, fighter planes, etc. which benefited the soldiers. Introduction of robots also made drastic change in military. The drones help the soldiers to keep track of enemy activities. The soldiers can execute the plan smoothly using the communication devices.

-Akanksha Gupta (SE EXTC A)

Military, Science and Technology, Finance and a wide market are those aspects which can make a country leading or dominating over others. India right from its independence has crossed many barriers to achieve a strong Military, good market and a growing economy. All this were able to achieve through daily growing advancement in fields of technology. Technology has always made defence stronger or one can say in order to make defence strong we make new advances in our technology. Drones, satellites, jet fighters, GPS, Weather radar etc have changed Indian military.

- Yogita Prajapati (SE EXTC B)

Today's world is drastically developing new technologies for mankind. These technologies have been considered as boon in many different sectors. Terrorism has always been a constant threat to the society. To ensure people's safety, many countries have strengthened their military system with the help of advanced technologies which are been invented and created by the scientists and engineers. Technology such as Cognitive radar technology or intelligent video analytics systems can be deployed to identify weapons and explosives also AI can be integrated with Robotic Surgical Systems (RSS) and Robotic Ground Platforms (RGPs) to provide remote surgical support and evacuation activities. As well as DARPA's Target Recognition and Adaptation in Contested Environments (TRACE) program uses machine learning techniques to automatically locate and identify targets with the help of Synthetic-Aperture Radar (SAR) images.

- Harshada hariyan (SE EXTC A)

Soldiers play very important role in lives of every Indian. We Indians have nothing more than the contribution of soldiers for our country. They are pride of our nation because we are happy and healthy in our houses, because they fought day and night on our borders. Soldiers are considered to be the gems of which we are proud of.

So the different and brilliant minds have designed useful weapons and made technological development for our soldiers in these few decades. Most of army equipment is of foreign design and are produced under the license of India. India is making efforts and is being successful to design and manufacture equipment locally.

The most equipment of army that manufactured is Small arms, Ammunition, combat vehicles, Artillery tanks etc. Future development for army can be like drones will be replaced by Fighter jets, robots can be replacing human soldiers, Global arm race, different advanced missile etc.

-Dakshata (SE EXTC B)

The main aim of the armed forces, in the world, is to protect the nation and citizens and territory from menaces. We are entering on a new era in Defence technology. Over the past decade we have seen remarkable progress from the computer science research community accelerated growth in the fields of robotics, learning and reasoning, language understanding, collective intelligence and other related technologies. These advances are reformulating the human-machine interface. Developing enhanced robot technology for explosive ordnance disposal (EOD) roles is surge in the defence sector. Traditional war-fighting technologies remain as important as ever. Desert patrol vehicles equipped with newly enhanced technology along with complex communication and weapon systems designed which is used for desert patrolling. Military technology, range of weapons, equipment, structures, and vehicles used specifically for the purpose of warfare. By the day today the defence area has involve use to technology in their search operation.

-Ujala pandey (SE EXTC B)

In this epoch, technology has become an essential part of warfare. Earlier in 1940, during the war, the scientific and engineering research developed nuclear weapons, radar, jet engines, proximity fuses, submarine and other weapons were evolved. The priority still continues in 21st century with the advanced military application from the field of electronics, computers and software. Mobility for soldiers plays an important role for allowing troops and weaponry, but after the invention of aeroplanes and military aviation, became an significant equipment for warfare. Earlier, The system included telegraph, flag signalling and heliographs, but due to Sensors and communication systems it involved enormous work to detect enemies and to coordinate armed forces.

-Sukanya Konar (SE EXTC B)

Indian army, air force and navy are the best examples to check the growth of our country. These are growing day-by-day in the technical fields due to our active engineers who are making it easy for them to fight for our country and take care of us. While fight for our nation it becomes difficult to save themselves from the attacks and also cope up with the other nations in this competitive world, where everybody wants to be the best at everything. Today our country INDIA stands at the sixth position of being the strongest military with really good technologies. Military technology is the application of technology for use in warfare. It comprises the kinds of technology that are distinctly military in nature and not civilian in application, usually because they lack useful or legal civilian applications, or are dangerous to use without appropriate military training.

-Snehalraj Verma (SE EXTC B)

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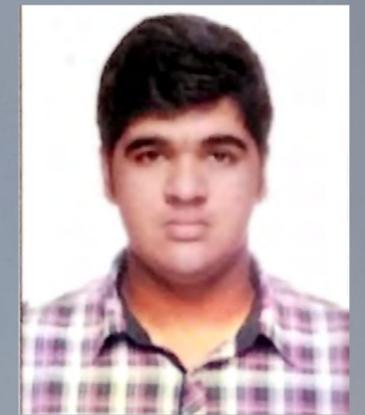
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