



**J.B. INSTITUTE OF ENGINEERING AND TECHNOLOGY
(UGC AUTONOMOUS)**

**DEPARTMENT OF
COMPUTER SCIENCE & ENGINEERING**

COMPUTING INTELLIGENCE

**TECHNICAL MAGAZINE
JUNE 2019**

About JBIET



As one of the top ten most preferred institutions in Telangana, JBIET continues to strive to impart technical (engineering) and professional education of very high standards.

The aim of JBIET is to mould young learners into globally competitive professionals who are professionally deft, intellectually adept and socially responsible.

The expert faculty at JBIET inculcate the best values and principles, ascribing to a modern curriculum; while the students imbibe pragmatic perception and a pro-active nature, which spurs them towards exploration and advanced inquiry, resulting in valuable insights.

The Placement record of JBIET over the years is proof of our right efforts in enabling the best in class engineering, technical and professional education to aspirants.

Vision of the College

To be a centre of excellence in engineering and management education, research and application of knowledge; to benefit society by blending ethical values with globally relevant learning.

Mission of the College

- ▶ To provide world class engineering education, encourage research and development.

- ▶ To evolve innovative applications of technology and develop entrepreneurship.
- ▶ To mould the students into socially responsible and capable leaders.

About the Department

- ▶ Established in 1998 with B.Tech CSE with intake 60
- ▶ M.Tech CSE Started in 2005 with intake of 18
- ▶ Present intake B.Tech CSE 120 M.Tech CSE 18
- ▶ Total Faculty 24 Non-Teaching :8
- ▶ No of labs :10
- ▶ Dept Library
- ▶ No of MOU'S with industry :6
- ▶ Good Placement Record& Higher Education
- ▶ R&D and Project Labs
- ▶ Professional Chapters
- ▶ Good Teaching and Learning process
- ▶ Good Student Supporting System

Vision of the Department

To meet the emerging trends in computer Science and Engineering, strive for self-reliance enabled through high end research by adapting a futuristic approach.

Mission of the Department

To impart qualitative education, prepare students refurbish their latent talents and aspire for a pragmatic career in Computer Science and Engineering

To provide an ambiance to develop strategic areas of advance study with perception to foster industry centric education in computer science and Engineering.

To inculcate self-learning among students to make them self-reliant and socially responsible.

Program Educational Objectives (PEOs)

Program outcomes are narrower statements that describe what students are expected to know and be able

To do upon the graduation. They are formed in line with the graduate attributes of NAAC. These relate to the Skills, knowledge, attitudes, values and behavior outcomes that students acquire through the program.

PEO1	To emphasize analytical, computational and programming based tools and methods of computer science and engineering to solve real world problems.
PEO2	To mold the student's career by steering their confidence levels for better understanding, strengthening technical outlook for innovation and better communication at the job place where they are employed.
PEO3	To hone the technical skills for creating and productivity in computer science and engineering beyond classroom learning.
PEO4	To promote multi-disciplinary awareness through exposure to areas of project development and industrial training for sustainable competition in Research and Development.



Lasting Legacy of Late Shri. J. Bhaskar Rao

B.Com; L.L.B.,
Founder Chairman of JB Group

Chairman's Message

In my position as the Chairman of all the J.B. Group of Educational Societies and all the J.B.Group of Educational Institutions, I convey my best wishes to all our relentlessly advancing institutions nestled in a sprawling woody campus of about 106 acres of land, on the main road at Yenkapally, Moinabad Mandal, R.R.District. The efficacy of the group can be witnessed from the establishment of three Engineering Colleges; J.B.Institute of Engineering & Technology.Joginpally.B.R.Engineering College; and Bhaskar Engineering College, besides the manifestation of Bhaskar Medical College and Bhaskar General Hospital. My lifetime ambition and objective being the provision of education, from KG to PG, to the underprivileged students of rural background, we have been providing free education, up to High School level in English Medium, to the poverty-stricken destitutes of our countryside. We established J.B. Institute of Computer Technology during 1996-97 with PG Courses in MCA and MBA, in the vicinity of Lord Balaji's abode, Tirupathi, as well. The management started two new Womens Engineering Colleges at Hyderabad and Tirupathi from the academic year 2008-09. The management encourages the youth of this state to find their careers in the noble profession of medical practitioner, by imparting quality medical education, and help our people lead healthy lives.

The World since recent times had been moving amazingly fast and fiercely competitive in all spheres of human activity. The said situation called for massive expansion of career focused education, particularly in Engineering, Management and such other professional areas. As a result, there had been mushroom growth of Institutions at a phenomenal level in the private sector. However; it is unfortunate to observe that the quality of education started eroding. The urgent need of the times was to lay emphasis on quality education and to strive vigorously for global excellence and acceptability. It is exactly at this critical juncture of time i.e. in the year 1993, J.B.Educational Society was established to serve the cause of the spread of general, Professional and Engineering education by a team of enlightened persons, under my Chairmanship.

The J.B. Group of Educational Societies has been maintaining an excellent academic track record for more than a decade. The J. B.Institute of Engineering & Technology (1998),Bhaskar Engineering College and Bhaskar Pharmacy College (2007) were established by J.B.Educational Society.Joginpally B.R. Engineering College (2002), Bhaskar

Medical College (2005) and Joginpally B.R. Pharmacy College (2007), were established under the banner of Joginpally B.R. Educational Society.

J.B.I.E.T. has well developed infrastructural facilities, such as adequate built up area, well equipped laboratories, libraries and information centers with digitalization and automation and on line transaction facilities in the campus. All facilities such as Medical, Transport, Canteen and Games & Sports, are available besides Seminar Halls, Conference Halls, Indoor Auditorium, Open-Air Theatre, Post Office and Banking.

We have encompassed Jawaharlal Knowledge Centre at J.B.I.E.T and J.B.R.E.C. to empower students to acquire Interactive Communication skills, Technical and employable skills to compete in the Global job market. The policy of this Management is to impart quality education and train the students and for the accomplishment of the same, we have recruited resourceful faculty that are dynamic dedicated and committed to the goal oriented efficient teaching with effective methodology. We have recruited seven Professors with Ph.D Degrees to hold the posts of HODs of the respective seven branches, apart from the principal with vast experience in the field.

J.B.I.E.T., being an NBA accredited institution and the winner of the status of JNTUs Permanent Affiliation, is one of the best 10 Engineering Colleges of the state, and also is the most preferred institution for aspiring students and their parents. The enrollment of students in JBIET has crossed the 3000 mark and went even higher in the academic year 2008-09.

The institute has launched a host of Faculty and Staff Development Programs, R&D, and Industry and other external project consultancy activities. We have taken up faculty, staff and students' Welfare and other HRD measures.

I have great pleasure in conveying the tiding that we have submitted proposals to the U.G.C. authorities for grant of Deemed to be University Status, for which the Government of Telangana and JNTU were pleased to issue No Objection Certificates. We are expecting that the said grant will be accorded in 2009.

National Seminars and Conferences are being organized frequently at our M.N. Rao Auditorium (air conditioned). Experts from Academia and Industry are invited to address and interact with the students. The Management has been sponsoring the deserving students and faculty to present technical papers and participate in the International Conferences in India and abroad. The Management has taken all possible measures for the career development and placement of all the qualified students domestically and globally.

NBA team of experts have visited and inspected J.B.R.E.C. on 20th & 21st February, 2009 to consider for the grant of Accreditation of four U.G. programs offered at the College.

We are fortunate to have the three renowned Academic Administrators, eminent scholars and the former illustrious Vice Chancellors of Osmania University and JNTU on the panel of Governing Bodies and the Advisory Bodies of J.B.Group of Educational Institutions, who extend their precious advice, and expert guidance, from time to time to formulate strategies in the cause of holistic development of the students.

On the eve of the Annual Day celebrations of JBIET, Bhaskar Engineering College, Bhaskar Pharmacy College, JoginpallyB.R.Engineering College, JoginpallyB.R.Pharmacy College, this year, we organized Spoorti-2009 (A Techno Cultural Fete) in the most befitting manner.

I have immense pleasure to welcome and congratulate all the Principals, Faculty, Staff and Students of all the colleges housed in the Campus for their laudable efforts in organizing Infoquest-2009 and Inxs-2009, studded with several student centric activities, spanning over three consecutive days i.e. on 26th, 27th and 28th February, 2009 and also for bringing out a souvenir 'Spoorti-2009' to commemorate the events.



J.V. KRISHNA RAO
MBA HR - USA

Secretary Message

“Education is the passport to the future, for tomorrow belongs to those who prepare for it today”.

JB Institute of Engineering & Technology was established in the year 1997 under the umbrella of JB Group of Educational Institutions, Hyderabad. At present JBIET is a UGC Autonomous Institution and permanently affiliated to JNTU Hyderabad.

The Speedy development in the field of Information & Technology has accelerated the demand for the value based education in the stream of Engineering, Technology and Management which is qualitative, progressive and multidimensional in competitive global environment. We provide quality education beyond the four walls of classroom to cope up with the corporate world.

The aim of JBIET is not only to produce mere degree holders, but the bright, talented men and women equipped with all round development of personality. Our vision of the institute is to impart quality education with Life Skills in all core disciplines of knowledge by developing global leaders who are passionate, committed and confident to take initiative in the nation building and create a peaceful environment for WORK, WORKER AND WORKPLACE.



Major General Prof Dr S S Dasaka, SM, VSM (Retd)
CEO – JB Group of Educational Institutions, Hyd.

CEO Message

I welcome you all to the portals of J.B. Institute of Engineering and Technology (JBIET) a Great Institution by all standards. Engineering continues to be a lucrative career for the bright minds, as it is only through engineers that the inventions of science can reach the masses, for the overall development and welfare of the society. With numerous development projects being executed and planned within the country and outside, engineers have a bright future. And at JBIET, we ensure that it happens.

JBIET has been one of the best engineering colleges in the two states of Telangana and Andhra Pradesh. It has been striving hard to not only maintain its standards but also to continuously improving them, so as to benefit the students in particular and the society at large. The college boasts of well qualified and self motivated faculty who have rich experience in academics, industry and research. They are backed up by experts from the industry. The curriculum is regularly revised to keep pace with the industry requirements, so that the students pass out as industry-ready graduates. The institute has excellent infrastructure, laboratories and workshops. The calm and quiet environment in the lush green campus, away from the hustle-bustle of the city, provides a tranquil environment, so conducive to quality Teaching -Learning.

In today's age, everyone is aware that besides class room studies, colleges should Concentrate on overall development of students by laying adequate attention on co-curricular and extra-curricular activities. At JBIET, we are very focussed about the same and ensure that all students are put through "Life Skills and Employability Skills Training" right from the first semester itself. The JB Educational Group of Institutions has Architecture, Pharmacy, Law, Medical and Dental Colleges, all co-located within the same campus, along with JBIET. This provides to students the much needed inter-disciplinary teaching-learning environment, which is otherwise not available in many stand-alone colleges.

The college not only inculcates a Creative and Innovation Spirit in the minds of our Students but also actively encourages them through the Group's JB Institute of Inventors Association of India (JBIIAI). This body provides intellectual support, logistics support and financial support, right from ideation to commercialisation. We hand-hold the students right through and ensure that they become Job-providers rather than Job-Seekers.

It will be the sincere endeavour of JBIET to turn you into knowledgeable Graduates / Postgraduates by guiding you and moving along with you

during your studies at the institute. I would like to wish you all a studious, satisfying and enjoyable journey in this institute. Along with your parents/guardians, we at the institute, will be looking forward eagerly and confidently to your bright success; so does the society and the nation. Remember what Swami Vivekananda said “Arise, Awake and Stop not, till the goal is reached”.

Looking forward to moving along with you in your beautiful journey ahead.
Come, join us!
Wishing you All the Best!

Message from the Desk of Principal

I am very much pleased to see the keen interest and devotion of the students of ECE, JBIET towards the publication of the Department technical magazine. This is an indicator of the communication skills of the students, which is rising day-by day. And the way students are putting across this message to the reader shows that their communication skills are raising. TECHTRONICS is a magazine that provides you with everything you need to know.

Our college is one, that strives for excellence in every field, with academics, sports, cultural or co-curricular activities. It is true that your academic performance matters the most you go for an interview, but when you furnish details of how much you have participated in co-curricular activities, apart from your academics may impress the interviews. So build your communication skills and vocabulary by participating in co-curricular activities.

Here, wishing all the happy reading.

Dr. Towheed Sultana
Principal, JBIET

Constitution of Editorial Board:

Editor and Editorial Board, for the publication of Technical Magazines, Newsletters is appointed by the HOD . The student representatives in this publication are also decided by the HOD. Technical Magazine and News Letters covers of following items:

- News about latest Technical inventions and innovations.
- Technical activities and achievements in the Department.
- Articles from Department Faculty and Students related to various areas of interest.
- Details about Seminars, Workshops, Conferences at JBIET.
- Achievements of the students & faculty.

Process of Publishing:

- Editor with the help of the Editorial Board collects the news items related to CSE from various Magazines, Newspapers and Professional Societies and also calls for the articles publications from students and faculty giving a fixed target time.
- These articles are screened by Editorial Committee for publication into Magazines/Newsletter.
- Technical activities and achievements in the Department are collected based on the information available to HOD.
- Sometimes, special issues are planned based on the current topics and new technological trends.
- Details about Seminars, Workshops, and Conferences at JBIET are collected from IQAC.
- After collection, a basic draft is created and submitted to advisory board for proof reading. Later, this content is formatted on publishing software like Microsoft Publisher, Scribus etc.
- Frequency of Publishing Magazine Once in a Year and News Letters is Twice in a Year.

Process of Dissemination:

- E-copy of the Newsletter/Magazines are disseminated through JBIET Website. Printed copies of the same are available in the Department and Central library.

Ensuring Students Participations

- Students are encouraged to write articles and submit news items.
- Students get recognition and appreciation for their articles published by them, among their Cohorts.
- Student's achievements are also published to keep them motivated.
- Student's representation is also made in the editorial board.

Board of Editors

Chief Editor:

Dr. P. SrinivasaRao, Professor, Dept of, HOD CSE

Associate Editor: Dr.

Dr. Niraj Upadhayaya, Professor, Dept of CSE

Faculty Coordinators:

Dr. Gallipoli Apparao Naidu, Professor, Dept of CSE

Technical Support:

Mr.K.Ramakrishna, Asst professor dept of CSE

Mr.K.Srikanth, Asst professor dept of CSE

Student Coordinators:

Mr. Hajari Nandha Kumar, IV yr, Dept CSE

Ms. Aditi. S.D. IV yr, Dept CSE

Cover page Design:

Sohaib Ahmer, IV yr, Dept CSE

ARTICLES

1. IS BLOCKCHAIN THE FUTURE?

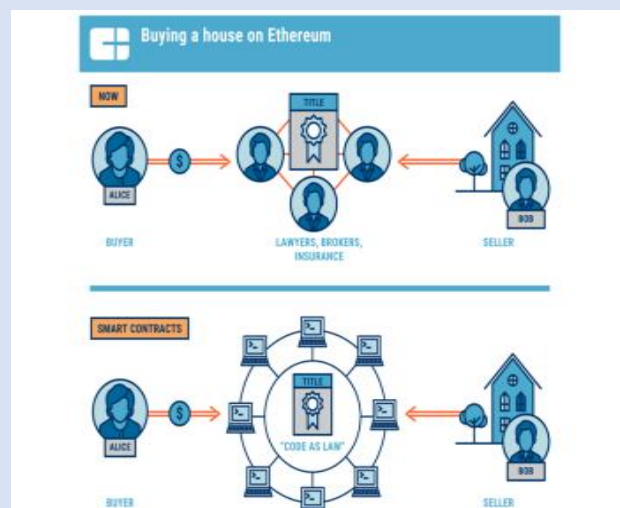
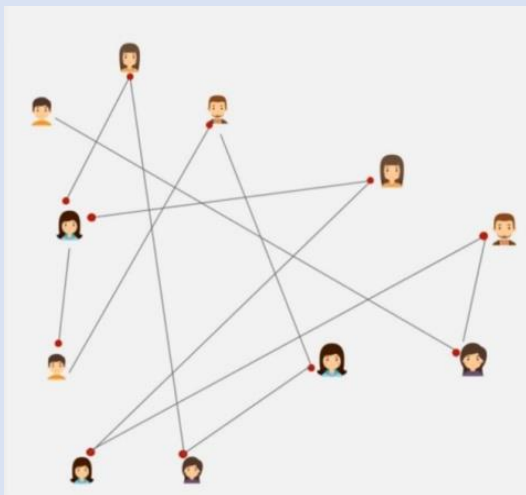


Blockchain first started as a way to move bitcoin from point A to point B, But it's now being used by a host of big companies to monitor and move any number of assets around the globe as like sending mails. It's emerged to be Real-world technology option in the past decade, termed to change IT in the same way Open-source software did in 19's. Blockchain was invented by a person (or group of people) using the name Satoshi Nakamoto in 2008 to serve as the public transaction ledger of the cryptocurrency

bitcoin.

By allowing digital information to be distributed but not copied, blockchain technology created the backbone of a new type of internet. Originally devised for the digital currency, Bitcoin blockchain, the tech community has now found other potential uses for the technology. A blockchain is, in the simplest of terms, a time-stamped series of immutable records of data that is managed by a cluster of computers not owned by any single entity. Each of these blocks of data is secured and bound to each other using cryptographic principles. Hence, anything that is built on the blockchain is by its very nature transparent and everyone involved is accountable for their actions. The blockchain passing information from A to B in a fully automated and safe manner. One party to a transaction initiates the process by creating a block. This block is verified by thousands, perhaps millions of computers distributed around the net. The verified block is added to a chain, which is stored across the net, creating not just a unique record, but a unique record with a unique history.

Block chain in Real Estate helps in storing the Ownership and title details



on the blockchain, thereby making it easier to transfer ownership and trace ownership. Eliminating paper from the equation, it offers a crystal-clear picture of legal ownership. Titles are stored on the blockchain network and can be viewed, altered, and updated whenever required.

Block chain in Health care makes the patient, being the central point of the healthcare ecosystem, has the right to accurate information. It can also be looked into as a matter of life and death. Privacy and security of health data are very important. It helps in tracking the serials and batch numbers of prescription drugs. Hospitals have moved away from paper for record keeping and they use blockchain technology to store patient data, which is kept confidential. The patient would be given a numberkey to access these records, thereby keeping him in control of who can view that data. However, more research still needs to be conducted to better understand, characterize and evaluate the utility of blockchain technology in Healthcare.



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2. BIOMETRIC TECHNOLOGY

Biometric technologies generally refer to the use of technology to identify a person based on some aspect of their biology. Fingerprint recognition is one of the first and original biometric technologies that have been grouped loosely under digital forensics.

With the ever-growing number of video surveillance cameras mushrooming in large cities, the use of the data captured by these cameras has been at the center of a number of privacy and human rights storms. Following the

9/11 terrorist attack, the use of facial recognition, especially in crowded places, as a means of detecting possible threats has been debated widely. The way the technology works is straightforward. CCTVs in streets, public places, and office buildings record images 24/7, sophisticated algorithms then carry out a matching exercise with an existing database of images of potential “villains” or “targets.” A match will trigger enhanced surveillance and possible future and further action. For the system to be effective, the matching database should be as wide and comprehensive as possible.

It is not surprising to note that to put such a database together security agencies never (at least we cannot identify any evidence) consult or seek permission to keep people's records in their data centers. Furthermore routine phishing activities through the Internet and social networks provide a fertile ground for not only a simple one-dimensional set of data (photos and other personal data) but potentially three-dimensional datasets of associated friends, links, habits, and quite often current location.

What is biometrics technology?

Biometrics is the science and technology of analyzing human body characteristics.

Divided into two basic categories, biometrics technology collect data from physical or behavioral attributes related to the human body.

Generally refer to the use of technology to identify a person based on some aspect of their biology. Fingerprint recognition is one of the first and original biometric technologies that have been grouped loosely under digital forensics.

Biometric technology is capable of ensuring fast and reliable protected access to information. Uses of biometrics in today's society

Biometrics is a quickly developing technology that is extensively used in a lot of fields including forensics. It can be used for criminal identification and prison security, and has the potential to be employed in a huge array of civilian relevance projects.

Biometrics can be exercised to check illegal access to ATMs, cellular phones, smart cards, desktop PCs, workstations, and computer networks.

For example, each of Disney's Magic Bands are equipped with a short-range radio frequency identification chip. The wearable's track visitors as they flow across the park and link to their credit card, allowing them to do everything from reserve rides to place food orders without standing in long lines.



(Visitors use Magicbands to access DisneyAttractions without standing in long lines)

Three burgeoning applications of biometrics technology:

1)Measuring movement

Scientists are working on measuring gait – the way people walk and move. Naturally, this behavioral biometric is most suited to serve surveillance analysis.

2)The beat of your heart

Phonocardiograms could potentially change the way that heart ailments are diagnosed. Some cardiac defects are best detected by the sounds that your heart makes.

3)Typing recognition

Researchers are working on keystroke dynamics, a behavioral biometric that analyzes the speed and the pressure exerted on each key when you type. This could improve identification verification services so that sensitive information such as health care data can be shared online.

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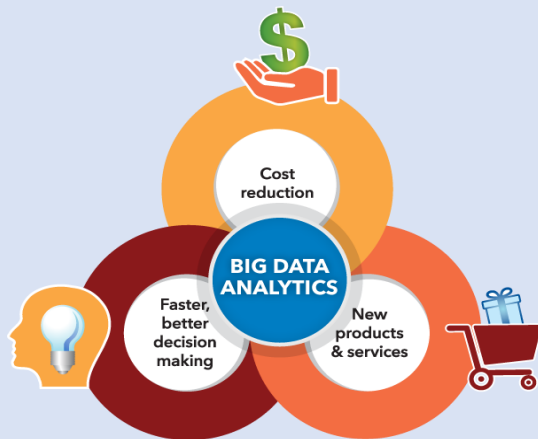
3. History and evolution of big data analytics

The concept of big data has been around for years; most organizations now understand that if they capture all the data that streams into their businesses, they can apply analytics and get significant value from it. But even in the 1950s, decades before anyone uttered the term “big data,” businesses were using basic analytics (essentially numbers in a spreadsheet

that were manually examined) to uncover insights and trends.

The new benefits that big data analytics brings to the table, however, are speed and efficiency. Whereas a few years ago a business would have gathered information, run analytics and unearthed information that could be used for future decisions, today that business can identify insights for

immediate decisions. The ability to work faster – and stay agile – gives organizations a competitive edge they didn’t have before.



Why is big data analytics important?

Big data analytics helps organizations harness their data and use it to identify new opportunities. That, in turn, leads to smarter business moves, more efficient operations, higher profits and happier customers. In his report *Big Data in Big Companies*, IIA Director of Research Tom Davenport interviewed more than 50 businesses to understand how they used big data. He found they got value in the following ways:

1. **Cost reduction.** Big data technologies such as Hadoop and cloud-based analytics bring significant cost advantages when it comes to storing large amounts of data – plus they can identify more efficient ways of doing business.
2. **Faster, better decision making.** With the speed of Hadoop and in-memory analytics, combined with the ability to analyze new sources of data, businesses are able to analyze information immediately – and make decisions based on what they’ve learned.

3. New products and services. With the ability to gauge customer needs and satisfaction through analytics comes the power to give customers what they want. Davenport points out that with big data analytics, more companies are creating new products to meet customers' needs.

Big data analytics in today's world: Most organizations have big data. And many understand the need to harness that data and extract value from it. But how? These resources cover the latest thinking on the intersection of big data and analytics. Statistics and Machine Learning at Scale The concept of machine learning has been around for decades and now it can now be applied to huge quantities of data.

Bringing the power of SAS® to Hadoop: Want to get even more value from Hadoop? This paper presents the SAS portfolio of solutions that help you apply business analytics to Hadoop.

Health care and big data analytics: A big data boom is on the horizon, so it's more important than ever to take control of your health information. This webinar explains how big data analytics plays a role

The hard work behind analytics: To understand the opportunities of business analytics, MIT Sloan Management Review conducted its sixth annual survey of executives, managers and analytics professionals.

Banking



Financial institutions gather and access analytical insight from large volumes of unstructured data in order to make sound financial decisions. Big data analytics allows them to access the

information they need when they need it, by eliminating overlapping, redundant tools and systems.

Manufacturing



For manufacturers, solving problems is nothing new. They wrestle with difficult problems on a daily basis - from complex supply chains, to motion applications, to

labor constraints and equipment breakdowns. That's why big data analytics is essential in the manufacturing industry, as it has allowed competitive organizations to discover new cost saving opportunities and revenue opportunities.

Retail

Customer service has evolved in the past several years, as savvier shoppers expect retailers to understand exactly what they need, when they need it. Big data analytics technology helps retailers meet those demands. Armed with endless amounts of data from customer loyalty programs, buying habits and other sources, retailers not only have an in-depth understanding of their customers, they can also predict trends, recommend new products – and boost profitability.

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4. AIRCRAFT GPS TECHNOLOGY

Gps Aircraft Tracking

GPS aircraft tracking is used in both commercial and personal aircraft, and it comes along with a variety of benefits both to safety and convenience. What a GPS does on an aircraft in terms of tracking is a lot different than what a GPS may do in your car. GPS tracking can help to ensure your position in the sky and keep you safe while going about a day of flying.

Benefits Of Gps Aircraft Tracking:

In order to understand the benefits of GPS aircraft tracking, one will first need to understand just how it works. A device with a GPS sensor is embedded into the aircraft, and it is able to transmit real-time GPS positions of any plane to a server board located on the ground. This sensor may be placed in a number of different areas or positions on the plane depending on the specific make and model, but all sensors work similarly in tracking a plane's current position at any time. These positions can then be picked up on by



air traffic controllers on the ground that will be able to locate airplanes of all sizes, and at all elevations, within any given area and at any given time.

GPS aircraft tracking can provide a number of benefits, even outside of the obvious benefits involving safety. The use of this type of technology can help to calculate flight times to and from any number of destinations so that pilots can get a better understanding of their time of departure compared to time of arrival, and it can also aid in the finding of an aircraft in the instance of an accident. Additionally, GPS aircraft tracking can even be used in flight schools to allow pilots in training to follow a certain path or flight plan laid out by an instructor.

GPS aircraft tracking is quite a bit different from the GPS technology we may use during our everyday lives in a car, but it provides the same amount of benefits when it comes to convenience, safety, and ease of navigation.

ACTIVE AIRCRAFT TRACKING

There are several active aircraft tracking systems available on the market that use the "bread-crumbs approach" to SAR. Rather than relying on an emergency locator transmitter to transmit upon impact, the next generation of emergency locating devices are active tracking devices that send position reports at regular time intervals. If the unit stops transmitting upon impact, the historical transmissions will give the last known location of the aircraft, its speed, direction and altitude. Tracking as an alternative or complement to current technology has recently been encouraged by the Coroner in New Zealand.

Working of GPS tracking system?

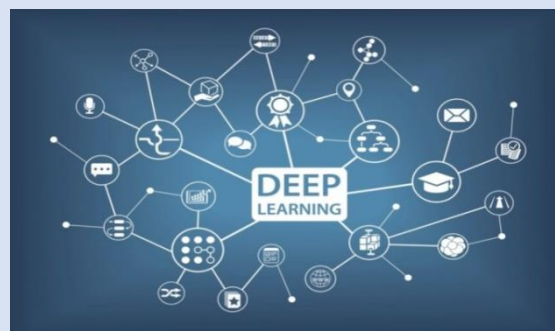
A GPS tracking system can work in various ways. From a commercial perspective, GPS devices are generally used to record the position of vehicles as they make their journeys. Some systems will store the data within the GPS tracking system itself (known as passive tracking) and some send the information to a centralized database or



A passive GPS tracking system will monitor location and will store its data on journeys based on certain types of events. So, for example, this kind of GPS system may log data such as where the device has traveled in the past 12 hours. The data stored on this kind of GPS tracking system is usually stored in internal memory or on a memory card, which can then be downloaded to a computer at a later date for analysis. In some cases the data can be sent automatically for wireless download at predetermined points/times or can be requested at specific points during the journey.

5. Deep learning is a machine learning technique

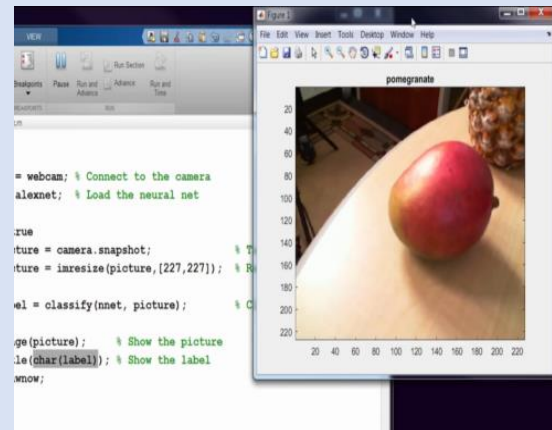
In a word, accuracy. Deep learning achieves recognition accuracy at higher levels than ever before. This helps consumer electronics meet user expectations, and it is crucial for safety-critical applications like driverless cars. Recent advances in deep learning have improved to the point where deep learning outperforms humans in some tasks like classifying objects in images.



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1. Deep learning requires large amounts of **labelled data**. For example, driverless car development requires millions of images and thousands of hours of video.

2. Deep learning requires substantial **computing power**.



High-performance GPUs have a parallel architecture that is efficient for deep learning. When combined with clusters or cloud computing, this enables development teams to reduce training time for a deep learning network from weeks to hours or less.

3. Pertained deep neural network models can be used to quickly apply deep learning to your problems by performing transfer learning or feature extraction. For MATLAB users, some available models include Alex Net, VGG-16, and VGG-19, as well as Cafe models

Object Detection Using Deep Learning:



In addition to object recognition, which identifies a specific object in an image or video, deep learning can also be used for object detection. Object detection means recognizing and locating the object in a scene, and it allows for multiple objects to be located within the image.

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6. Multimedia-conferencing

Asynchronous communication media (e-mail, news groups, ftp, etc.) has been widely used in the academic community. In the last few years, with the advent of faster networks new synchronous communication media have appeared. They are usually referred to as multimedia-conferencing systems. Multimedia-conferencing supports meetings among people in different locations. The simplest systems only allow unidirectional communication from a source to multiple people. The most advanced ones allow multi-party conferencing, so that each participant can participate both passively (by simply watching and hearing) and actively (by speaking). Technologies discussed in this section are part of a wider area: computer-mediated communication that deals with the interaction between people by means of computers.

Multimedia-conferencing has many applications, although the most important one is tele-teaching or distributed electronic classrooms. Lectures can be broadcasted via networks (ISDN or Internet), using a multimedia-conference system. For instance, a course can be shared by two or more centers, that is, students can be located at different centers, and the lecturer can be at any of the centers. Some advantages of multimedia conferencing are:

- It provides support for distant education (via distributed classrooms), so education can reach remote places, providing a new alternative for open universities.
- Courses can be shared among centers [Pad], making possible international/inter-center joint tele classes.
- It can make easier multidisciplinary curricula.
- It provides new possibilities for students with disabilities as they can save displacements, and they can advance at their own pace.
- Lectures can be recorded, what allows students repeating some parts of the lecture, or attending it asynchronously (although in this case without the possibility of interaction).
- Lectures can be enriched with additional annotations (this will be explained further in section 5).

- Another important application is tele-tutoring. This technology enables the possibility of face to face interaction between a lecturer and a remote student.

There are currently two families of standards: ITU (International Telecommunication Union) and MBONE. ITU has developed its H.3xx and T.12x recommendations to support multimedia conferencing, both for circuit switched networks (H.320, H.324) and for packet switched networks (H.323). MBONE videoconferencing tools are based on IETF (Internet Engineering Task Force) standards and widely used in the academic community. These tools have been developed in part within the MICE ESPRIT project (Multimedia Integrated Conferencing for Europe) and the MERCI project of the Telematics Applications Program (Multimedia European Research Conferencing Integration). One of the goals of the MERCI project is to allow interoperability between both standards.

Multimedia-conference systems provide a set of tools to support real-time interaction. The most common tools are real-time video, real-time audio and shared white-boards. The first two allow the transmission of video. White-boards allow the presentation of electronic material to all participants, any of the participants can contribute, and his contribution is seen by all participants.

These tools are freeware (they can be got at [Merci]) what make them especially attractive for educational purposes. Next, they are briefly described:

- Vat and Vic. They are real-time multi-party audio and video conferencing tools. It usually provides audio for a full videoconference.
- Rat. It is a robust audio tool that it is designed to cope with packet loss and disordered packets.
- Web. It provides a shared whiteboard on which participants may write, draw and type making all contributions visible to all participants. It can also import PostScript pages.

Lectures can be broadcasted and recorded by means of video and audio conferencing tools, whilst their multi- party versions support multi-center

courses. One of the main problems with conferencing systems is their real-time requirements. Video is not very problematic as one frame per second can be enough for most occasions and small delays are not very important. On the other hand, audio is more fragile, as it can lose very easily its coherence (due to late, lost or disordered packets). There are currently robust audio tools as rat, but in the future with the advent of faster networks, and ATM networks that guarantee bandwidth the situation will improve.

The integration of electronic whiteboards (like wb) in conferencing systems supports the transmission of lecture material (slides, animations, etc.), but also the lecturer annotations on it. In multi-center courses the different participants can make annotations of the presented material being these annotations broadcasted to all, thus supporting discussions between remote participants.

Nowadays, there are conferencing environments, but there are two different standards, and most applications are not interoperable. In the future, most of these tools will be interoperable, so each participant will be able to participate with the platform and conferencing environment of his/her choice. White-boards will allow to transmit the screen of any application, without forcing to save snapshots in a particular format, so the lecturer will not have to spend any effort in exporting its material to a particular format.

It is possible that in a not very far future, that conferencing system will remove the frontier between remote and non-remote lectures, as remote participants will be virtually in the classroom with the same possibilities as a non-virtual student. Students will be able to enroll in international courses, without moving to the country or city.



Abhay Kumar, Assoc. Prof

7. An application of software project management in a multinational company

Project Proposal Introduction:

The organization in which the project is to be carried out is My solutions. It is a technology corporation, which is involved in developing, manufacturing, licensing and supporting a wide range of software products for devices. The objective of the company is to satisfy its customers, employees and shareholders with the help of delivering advance technology. It wants to increase its revenues by satisfying the customer needs and wants to excel in customer orientation. Managers from Sales, Consulting and IT departments have identified a problem that has reduced productivity to unacceptable levels. The current email system is causing significant business interruptions and must be updated. The current system is outdated so it need to be updated by meeting today's standards.

Stake holders of the project:

- Name of the project: Software Automation, Expansion and Integration
- Project Proposer: The top authority person and the member from IT department are the proposers of the project. They provide policy definition to the Project team. They are the persons who make final decisions and resolves conflicts or issues regarding project expectations across organizational and functional areas Project sponsor: The project sponsors provide executive team approval and sponsorship for the project.
- Project Stakeholders: The project stakeholders include Sales, Consulting and IT department management leaders and end users. They are the key provider of requirements and recipient of project deliverable and associated benefits
- Project Managers: Mr. James Johnson is the IT Department Head. His team provides overall management to the project. They are accountable for establishing a Project work structure, developing and managing the work plan, securing appropriate resources and delegating the work and insuring successful completion of the project.

- Project team: The team will include 2 executives or support managers, 1 market analysts, 2 product designers and 1 financial manager. The project team members are involved in analyzing, designing and ultimately improving or replacing the business processes.

Objective of the project:

The aims and objectives of the project are:

- To automate the current system and provide a efficient solution to provide fast and reliable mail services.
- To expand the existing activities or production facilities.
- Developing new servers, software and protocol in order to remain competitive
- To meet the changing demands of the customers
- To cut the incurring costs and increase the overall revenue.

Resources Required:

A variety of resources will be needed to implement the project of new product development. The main resources, which are considered in the project, are the financial resources and workforce or staff of the company. With the help of the team as well the staff, the project can be completed rapidly and before the decided duration (Resource consideration, 2019). The project can be successful only when a firm is capable of utilizing its limited economic resources optimally.

Cost estimates:

It is estimated that the task of forming the project team, plan phase and project estimation would be completed in 2 weeks.

OUTCOME:

The major outcomes of this project include both the technical as well as the behavioral aspects like designing the up gradation project, selecting the team who needs to undergo this project, appointment of the team, which is responsible for the project and timely evaluation and assessment of the project.

B.Nageswara Rao
Associate Professor.

8. Apache Spark: An Introduction

Spark is an Apache project advertised as “lightning fast cluster computing”. It has a thriving open-source community and is the most active Apache project at the moment. Spark provides a faster and more general data processing platform. Spark lets you run programs up to 100x faster in memory, or 10x faster on disk, than Hadoop. Last year, Spark took over Hadoop by completing the 100 TB Daytona GraySort contest 3x faster on one tenth the number of machines and it also became the fastest open source engine for sorting a petabyte.

Spark also makes it possible to write code more quickly as you have over 80 high-level operators at your disposal. To demonstrate this, let’s have a look at the “Hello World!” of BigData: the Word Count example. Written in Java for MapReduce it has around 50 lines of code, whereas in Spark (and Scala) you can do it as simply as this:

```
sparkContext.textFile("hdfs://...")  
    .flatMap(line => line.split(" "))  
    .map(word => (word, 1)).reduceByKey(_ + _)  
    .saveAsTextFile("hdfs://...")
```

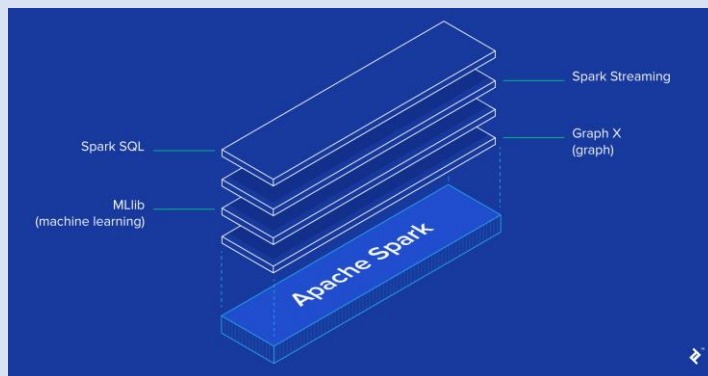
Another important aspect when learning how to use Apache Spark is the interactive shell (REPL) which it provides out-of-the box. Using REPL, one can test the outcome of each line of code without first needing to code and execute the entire job. The path to working code is thus much shorter and ad-hoc data analysis is made possible.

Additional key features of Spark include:

- Currently provides APIs in Scala, Java, and Python, with support for other languages (such as R) on the way
- Integrates well with the Hadoop ecosystem and data sources (HDFS, Amazon S3, Hive, HBase, Cassandra, etc.)
- Can run on clusters managed by Hadoop YARN or Apache Mesos, and can also run standalone

The Spark core is complemented by a set of powerful, higher-level libraries which can be seamlessly used in the same application. These libraries currently include SparkSQL, Spark Streaming, MLlib (for machine learning),

and GraphX, each of which is further detailed in this article. Additional Spark libraries and extensions are currently under development as well.



Spark Core: It is the base engine for large-scale parallel and distributed data processing. It is responsible for: memory management and fault recovery scheduling, distributing and monitoring

jobs on a cluster

- interacting with storage systems Spark introduces the concept of an RDD (Resilient Distributed Dataset), an immutable fault-tolerant, distributed collection of objects that can be operated on in parallel. An RDD can contain any type of object and is created by loading an external dataset or distributing a collection from the driver program.

RDDs support two types of operations:

- Transformations are operations (such as map, filter, join, union, and so on) that are performed on an RDD and which yield a new RDD containing the result.
- Actions are operations (such as reduce, count, first, and so on) that return a value after running a computation on an RDD.

Transformations in Spark are “lazy”, meaning that they do not compute their results right away. Instead, they just “remember” the operation to be performed and the dataset (e.g., file) to which the operation is to be performed. The transformations are only actually computed when an action is called and the result is returned to the driver program. This design enables Spark to run more efficiently. For example, if a big file was transformed in various ways and passed to first action, Spark would only process and return the result for the first line, rather than do the work for the entire file. By default, each transformed RDD may be recomputed each time you run an action on it. However, you may also persist an RDD in memory using the persist or cache method, in which case Spark will keep

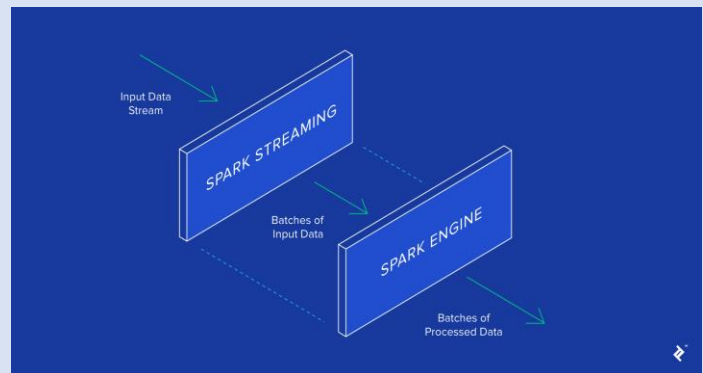
the elements around on the cluster for much faster access the next time you query it.

SparkSQL: SparkSQL is a Spark component that supports querying data either via SQL or via the Hive Query Language. It originated as the Apache Hive port to run on top of Spark (in place of MapReduce) and is now integrated with the Spark stack. In addition to providing support for various data sources, it makes it possible to weave SQL queries with code transformations which results in a very powerful tool.

Spark Streaming: Spark Streaming supports real time processing of streaming data, such as production web server log files. Next, they get processed by the Spark engine and generate final stream of results in batches, as depicted below.

The Spark Streaming API closely matches that of the Spark Core, making it easy for programmers to work in the worlds of both batch and streaming data.

MLlib: MLlib is a machine learning library that provides



various algorithms designed to scale out on a cluster for classification, regression, clustering, collaborative filtering, and so on (check out Toptal's article on machine learning for more information on that topic). **GraphX:** GraphX is a library for manipulating graphs and performing graph-parallel operations. It provides a uniform tool for ETL, exploratory analysis and iterative graph computations. Apart from built-in operations for graph manipulation, it provides a library of common graph algorithms such as PageRank.

M. Naveen Babu
Asst.Professor



9. Technology Trends

There's always something new on the horizon, and we can't help but wait and wonder what technological marvels are coming next.

The way we see it, there are Four major tech trends we're in store for in 2017. If you're eyeing a sector in which to start a business, any of these is a pretty good bet. If you're already an entrepreneur, think about how you can leverage these technologies to reach your target audience in new ways.

IoT and Smart Home Technology:

We've been hearing about the forthcoming revolution of the Internet-of-Things (IoT) and resulting interconnectedness of smart home technology for years. So what's the holdup? Why aren't we all living in smart, connected homes by now? Part of the problem is too much competition, with not enough collaboration—there are tons of individual appliances and apps on the market, but few solutions to tie everything together into a single, seamless user experience. Now that bigger companies already well-versed in uniform user experiences (like Google, Amazon, and Apple) are getting involved, we expect we'll see some major advancements on this front in the coming year.



Machine Learning:

Machine learning has taken some massive strides forward in the past few years, even emerging to assist and enhance **Google's core search engine algorithm**. But again, we've only seen it in a limited range of applications. Throughout 2017, We expect to see machine learning updates emerge across the board, entering almost any type of consumer application you can think of, from offering better recommended products based on prior purchase

history to gradually improving the user experience of an analytics app. It won't be long before machine learning becomes a kind of "new normal," with people expecting this type of artificial intelligence as a component of every form of technology.

Automation:

Marketers will be (mostly) pleased to learn that automation will become a bigger mainstay in and throughout 2017, with advanced technology enabling the automation of previously human-exclusive tasks. We've had robotic journalists in circulation for a couple of years now, and we expect it won't be long before they make another leap into more practical types of articles. It's likely that we'll start seeing productivity skyrocket in a number of white-collar type jobs—and we'll start seeing some jobs disappear altogether. When automation is combined with machine learning, everything can improve even faster, so 2017 has the potential to be a truly landmark year.

Humanized Big Data. (visual, empathetic, qualitative):

Big data has been a big topic for the past five years or so, when it started making headlines as a buzzword.

The idea is that mass quantities of gathered data—which we now have access to—can help us in everything from planning better medical treatments to executing better marketing campaigns. But big data's greatest strength—its quantitative, numerical foundation—is also a weakness. In 2017, I expect we'll see advancements to humanize big data, seeking more empathetic and qualitative bits of data and projecting it in a more visualized, accessible way.



Dr.G.Arun Sampaul Thomas
Asso. Professor

10.Using DNA as a Memory Drive

Scientists have successfully encoded a simple movie in bacteria DNA, and played it back. Using DNA for data storage is not as crazy as it sounds...Not that many years ago, if you had a “portable” hard drive, it was not actually that portable.

Today it’s possible to purchase a storage device capable of holding a gigabyte of data that’s small enough to swallow. And the next generation of computers and memory devices is even smaller: DNA. Scientists at Harvard have successfully encoded a simple movie in bacteria DNA, and played it back. Yes, really.

Using DNA for data storage is not as crazy as it sounds. After all, DNA already is an incredible storage device; cellular DNA basically contains all the information needed for an organism to function, stored in a microscopic package. The potential goes way beyond making a more complex memory drive: researchers want to record what happens inside living cells.



However, just because DNA is already a form of storage does not mean this is a simple process. The DNA data recorder has been approached from several angles, but a simple one is to insert a DNA sequence specially designed for memory storage and integrate it into a cell’s DNA. A 2012 study by Stanford and UW researchers used a phage virus and various enzymes to integrate their custom sequence into a bacterial DNA. Improved genetic editing techniques, e.g. CRISPR, simplify the process. Cells don’t live forever, but the recorder could survive repeated cell divisions. Once this technology is fully functional, some researchers think it could be used to study and record information on cancer replication at an unheard of level of detail.

The information could be used to devise far more effective treatments than currently exist.

The potential of genetic material does not end with data storage; biological computers are also under development. These scientists found biological systems to be elegant solutions for the physical barriers that start to appear as processors shrink. For example, in a tiny processor, circuits get too close together and may not be able to function without interfering with each other. In a biological computer, there are no circuits so these kinds of problems don't exist. Further benefits are that a molecular computer generates little heat and will not require energy intensive cooling systems.

There are a variety of ways to turn DNA (or RNA) into a computer, but the basic idea is that some sort of input causes a single strand of DNA or RNA to perform a reaction. A type of enzyme called DNAzyme catalyses or otherwise facilitates chemical reactions; the correct input will trigger a reaction corresponding to a Boolean command, such as "and," "or," "if," etc. These reactions replace the 1s and 0s typical of an electronic circuit.

There are certainly hurdles to overcome. It's relatively easy to create a simple molecular computer, but DNA does not perform its processes anywhere close to the speeds present in an electronic processor. Large-scale synthesis of appropriate molecules is slow and expensive. On the plus side, when it works, such a computer can integrate directly with a living system. Talk about being plugged in.

Mr.SathishKumar

Asst. Professor

11.Drones on Mosquito control

Most recently, drones are being considered to support mosquito control. One of, if not the most dangerous creatures on Earth, mosquitos have been spreading deadly diseases to humans for centuries. The latest plague they're spreading is the Zika virus, and current methods of preventing mosquito-borne diseases continue to be highly inefficient.

Traditional methods such as helicopters, planes or ground workers with handheld sprayers also fall short in obtaining significant data from animals that live in harsh environments—drones could be the answer. By catching

mosquitos, drones can help scientists to better understand and respond to the way diseases become epidemics. They can detect, catch and take blood samples of mosquitos to help them better mitigate the potential for infectious disease outbreaks before they become wide-spread health disasters.

Drones for Mosquito Control:

Not only in an effort to study these dangerous insects, but to effect more immediate results, drones are set to be the future of mosquito control. For instance, Ascension Parish, a small district in the state of Louisiana, recently bought a drone in time for peak mosquito season. This June, Ascension launched the drone to fly, hover and spray up to 20 pounds of chemicals at a time in hard-to-reach areas where mosquitos breed. There, a private mosquito control company has also been using drones to scout for breeding sites to kill larvae found in standing water, removing the next generation of mosquitos before they take flight. This method is one of the best ways to control the population of mosquitos and prevent the spread of disease to humans.

With drones, operators can spray with greater precision, which will allow the company to save on cost, improve worker safety and limit environmental impact unlike more commonly applied aerial methods. Drones outfitted with cameras can also survey hard-to-reach breeding sites and enable the rapid, repeatable and safe collection of high-resolution imagery. Aerial mapping with drones can be used to conduct site surveys and track job progress while conducting real-time data gathering and analysis.

Operational Intelligence Promoting Disease Control Innovations:

Currently, the Ascension Parish mosquito control company mentioned above has employees in training to operate drones and they have been continuing to work on licensing requirements with the Federal Aviation Administration (FAA). Safety and privacy concerns have often stalled the advancement of such commercial applications of drones. However, solutions like Simulyze's operational intelligence (OI) platform, for example, provide the foundation needed for safe UAS flight.

By providing a complete operational view of post-workflow data, OI provides deep analytics, real-time processing, insight and intelligence that enables better-informed decision making. OI is helping to grow this industry and improve mapmaking, surveying and UAS situational awareness altogether.

OI has proven that drones can be safely integrated into the national airspace and can provide the necessary measures for eased FAA regulations to allow for further use and study of commercial UAS applications. All things considered, drones are already on their way to the frontline of mosquito control and global disease research.

Dr.R.Vijayanand

Asst. Professor

12.SSH (Secure Shell) KEY MANAGEMENT

SSH KEY: SSH keys provide the match the pattern access as user names and passwords. Shell key is the logged in to multiple server and PIs, grant access to resources - production servers, databases, routers, firewalls, disaster recovery systems, financial data, payment systems, intellectual property, and patient information. Information security starts from controlling who is given access to system servers and data. If there is no control over access, there is no security, no confidentiality, no integrity, and no guarantees of continued operation

- Managing identities and credentials - SSH keys are access credentials
- Provisioning and termination process for access - including access based on SSH keys
- Segregation of duties - elimination of key-based access from test and development systems into production
- Disaster recovery - limiting attack spread from primary systems to disaster recovery sites and backup systems
- Privileged access controls - SSH keys are often used to bypass jump servers

- Boundary definition and documentation of connections for payment systems, financial data environments, patient data environments, or between government information systems
- Incident response and recovery - being able to change compromised SSH keys.

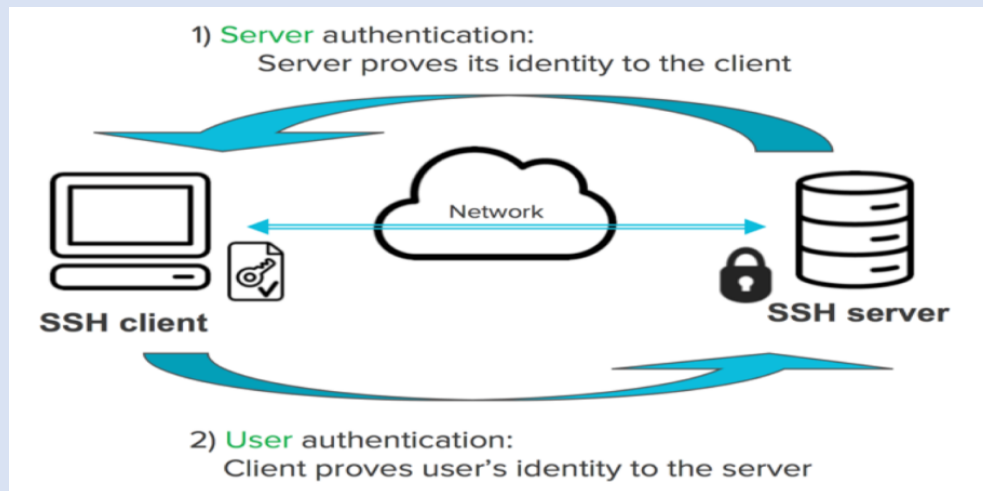


Fig: SSH keys

Generating SSH Keys:

SSH keys are always generated in two ways. These one consist of 'public' SSH key and one 'private' SSH key. These keys are paired using extremely strong algorithms, making it infeasible to guess or fake a private key, even if you know the public key. While private keys should be kept secret by the authorized person wishing to gain access to a system, public keys may be freely shared.

\$ ssh-keygen :

This will create a key-pair (a public and private key) in `~/.ssh/`. Keep the private key (`id_rsa`) on the PC and never share it. You can share the public key (`id_rsa.pub`) with others or place it on other servers.

To tighten security controls around SSH Keys, you should also apply the following six best practices:

1. Discover all SSH Keys and Bring under Active Management

A first step to eliminating SSH key sprawl and properly assessing SSH security risk is to discover and inventory all SSH keys, and then to reign in centralized control of all keys. This is also an appropriate juncture to determine who is using various keys and how the keys are being used.

2. Ensure SSH Keys Are Associated With a Single Individual

Tie SSH keys back to an individual, rather than just to an account that can be accessed by multiple users. This will provide an effective SSH audit trail and more direct oversight.

3. Enforce Minimal Levels of User Rights through PoLP

Apply the principle of least privilege (PoLP), such as in tying SSH keys to granular areas of remote devices, so users can only access certain, necessary systems. This limits the potential fallout from misuse of SSH keys.

4. Stay Attentive to SSH Key Rotation

Implement diligent SSH Key rotation -- force users to generate keys on a regular basis and disallow use of the same passphrases across multiple accounts or iterations. These actions help protect the organization from password re-use attacks. In organizations with a large SSH key estate, this can only be feasibly performed via an automated solution.

5. Eliminate Hardcoded SSH Keys

SSH Keys are one of the many types of credentials that can be embedded within code, such as in applications and files. This practice creates dangerous backdoors for malware and hackers to exploit. Embedded keys that use simple or default passphrases may be vulnerable to password-guessing and other attacks. Therefore, an important piece of SSH security is to uncover and eliminate embedded SSH keys, and bring them under centralized management.

6. Audit All Privileged Session Activity

Any privileged session started via a SSH Key authentication (or other means) should be recorded and audited to meet both cyber security and regulatory needs. Privileged session management activities can entail capturing keystrokes and screens (allowing for live view and playback). Ideally, you also layer on the ability to control (pauses or terminate) privileged sessions in real-time to maintain strong oversight and a short leash over privileged activity.

Conclusion

SSH keys turn out to be extremely common and widely used. Many large organizations have accumulated them for twenty years without any controls. A typical Fortune 500 enterprise has several million keys granting access to their servers. In one customer case, we examined 500 applications and 15,000 servers, and found 3,000,000 authorized keys and 750,000 unique key pairs. This organization also had over five million daily logins using keys. The keys were used for executing financial transactions, updating configurations, moving log data; file transfers, interactive logins by system administrators, and many other purposes. SSH is an important tool for system administration

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Srikanth Kama
Assistant Professor



Dr Sarvepalli Radhakrishnan dabbled in various roles starting from Philosopher to the President of India, but people remember him majorly for his contribution as a teacher. Radhakrishnan is acclaimed for dedicating his life towards education and improving the standards in the field of education. "Instead of celebrating my birthday, it would be my privilege if September 5 is observed as Teachers' Day," Dr Radhakrishnan said in 1962. Since then, Teachers' Day is observed across the country on his birthday, i.e., September 5. A recipient of Bharat Ratna, Dr Radhakrishnan, stands at the top when it comes to impeccable contribution to education. Dr Radhakrishnan is one of the role models to many aspiring minds.

