COLLEGE OF ENGINEERING FOR WOMEN

tech niyati

TECH NIYATI

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FINTECH ECOSYSTEM

SAMSUNG pay
DWOLLA
wealthfront
BitPesa
Pay
auxmoney
KYASH
bitcoin
GyanDhan
PayPal
Braintree
ProfitBooks

Placements

The college has a dedicated training and placement cell. The placement activities are coordinated by the placement team that comprises of staff from each department. The placement record shows the confidence of the industry in the academic standard of our college. The students are being recruited by reputed organizations wiz. TCS, Wipro, HCL, IBM, Intergraph, Syntel, Sonata, Mphasis, RapidBizApps, Sasken to name a few.

sasken

WIPRO Applying Thought

SYNTEL Consider IT Done

Mindtree Welcome to possible

SONATA SONATA SOFTWARE

MPHASIS an HP company

RapidBiz

TATA

TATA CONSULTANCY SERVICES

ASTRA

SANKALP semiconductor

HCL IBM

INTERGRAPH

Tech Niyati

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Principal's Message

Prof. E.V. Prasad

From : Principal's Desk - profevprasad@gvpcew.ac.in
Date : 4th April 2017

Dear Reader,

As I embark upon my journey as the third Principal for Gayatri Vidya Parishad College of Engineering for Women, I am jubilant to meet you through this page. Tech Niyati is a driving force for the students and faculty at GVPCEW to be proactive towards learning. As we try to prepare the students always to "think and review" so as to discover the cause and effect of every event, would surely reveal the hidden talents of the academic fraternity. It gives me immense pleasure to encapsulate yet another occasion of success. I congratulate every one who endeavours towards our cherished motto of empowering the students for all round development through technical education. Thorough acquisition of knowledge fringed with skills required and character building is our promise by providing necessary resources and resourceful intelligentsia ensuring expected settlement.

The call of the time is to progress, not merely to move ahead. Quality education depends mainly on performance of the students in academics, sports and cultural activities along with maintaining high values and ethics. I take pride to say that our students do well in all aspects. Our progressive management looks forward and wishes that our institute raises to the occasion by standing in the privileged front row. Steps are being taken in this direction and fruits of these efforts will be shared by our students in the near future.

Vision is strong ; the dream comes true only through grit, determination and devotion. I bless all the young aspirants to strive hard, use synergy to reach paramounting position in your desired path. Realize the immanent strength; never leave any stone unturned in the path of learning and gaining.

I am a staunch believer that the actions speak more than the words and that everybody must keep his promises to discharge duties as a responsible person of the society.

At this juncture let me quote lines of inspiration from Robert Frost:

"The woods are lovely, dark and deep.
But I have promises to keep,
and miles to go before I sleep"

My best wishes to all

Prof. E.V. Prasad

Editorial

We

From : Editor's Desk - editor@gvpcew.ac.in
Date : 1st April 2017

Dear Reader,

The encouragement given to the first issue of **Tech Niyati** by the Management, Faculty and Student fraternity was overwhelming. We thank them for the motivation and encouragement. The primary goal for **Tech Niyati** team is to ensure that, it has a broad set of articles, that are of wide interest to the scientific community and that these articles are all understandable, and readable by every undergraduate student, whatever their specialization may be.

The editorial team is constantly on the lookout for the potential new articles. An approach we have adopted in looking for ideas is to consider articles by recognized individuals from institutes of repute. We find that this is often a great source of inspiration. In this issue we have articles by Dr. Rajasekhar, Professor, IIT Kharagpur and Dr.SitaramaBrahmam G, Lead, Emerging Technologies Group, IP & E Unit, TCS, Hyderabad. We thank both of them for readily accepting our invitation to contribute to the magazine. This issue has regular and invited article that cover the broadest range of disciplines.

In this issue of **Tech Niyati**, we have regular articles by our own faculty that provides scientific and engineering information on varied disciplines for the professional development of our students in general. The Trending News and Article sections are chosen based on the current trends in various fields of engineering. All this and more has been written and placed in the next few knowledge pages.

Finally, we look forward to receive the feedback, contribution, suggestions from our esteemed readers at editor@gvpcew.ac.in

We wish you a happy reading

Editorial Team

Dr. A. Suseelatha* and **Dr. G. Sudheer****

* Assistant Professor, BS & H Department
** Professor & Vice Principal

FinTech: A Brief Introduction

Given the global scale of the banking industry, the interdependence between finance and technology has also grown steadily because Information Technology (IT) has facilitated the harnessing of economies of scale. In order to strengthen their fast growing operations and adapting themselves to more efficient technology frameworks, banks have been the front runners in IT spending. Notwithstanding, today's digitalization shift has revealed that most banking systems still need drastic reforms and leave the industry exposed to unexpected competition: FinTechs.

Financial Technology - FinTech for short - describes the evolving intersection of the financial services and technology sectors. The term basically refers to technology focused start-ups and new market entrants who innovate the products and services provided by the traditional financial services industry. These companies are imposing themselves against traditional models by using digital technology as a weapon to tear down the barriers of entry and potentially change the whole industry. The theory of innovation can provide the mindset to explain the transformation at play by revising, and helping to understand, the most common reasons that lead financial companies to go out of business or adapt themselves to the change.

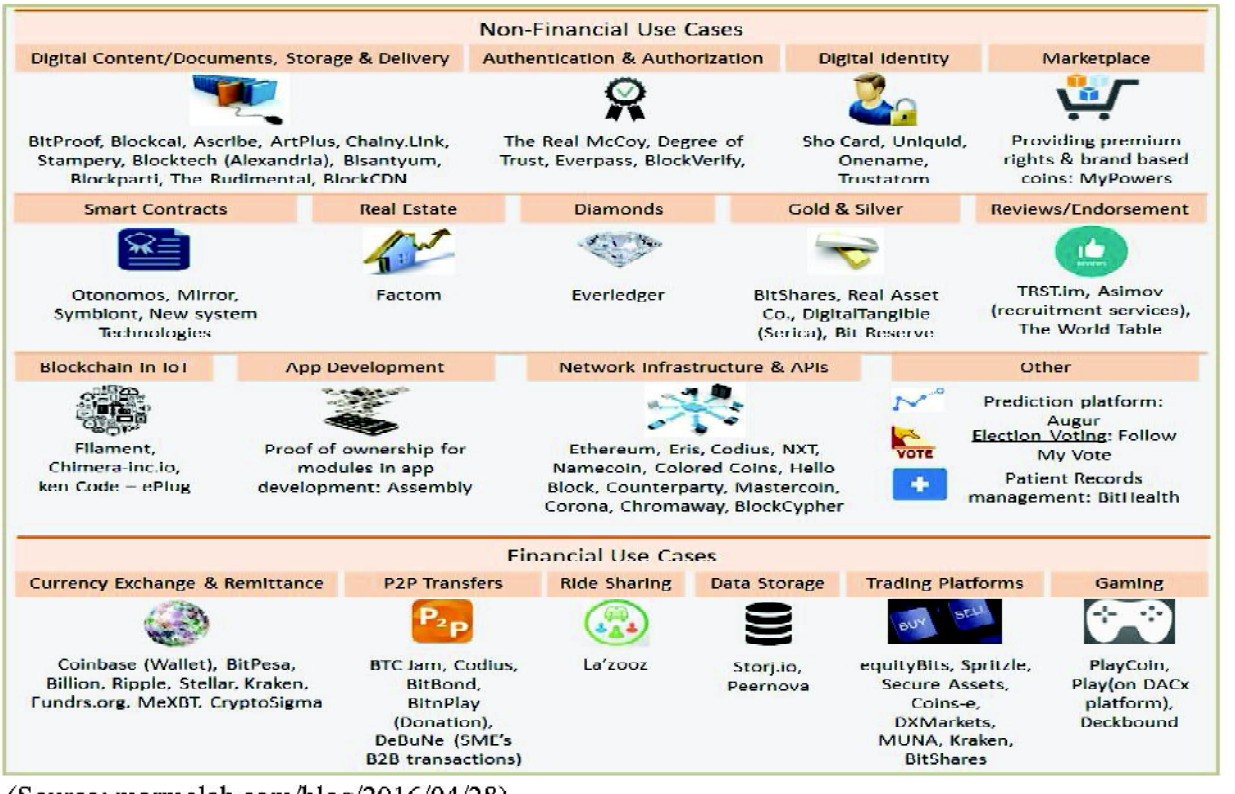
There are several players in a FinTech ecosystem and all these players are in motion, moving towards each other over time. The players include well-established financial institutions, big technology companies that are active in the financial services space but not exclusively, companies that provide technology to facilitate financial services and start-ups focused on a particular innovative technology/financial process. The first issue is that the motive for the market players to get involved in the formation of a common solution is, for various reasons, obscured. The majority of financial institutions, when facing regulatory obligations, undertake cost/benefit analyses to locate the most efficient approach to comply with each party's regulation. This has led to the rise of younger sibling RegTech of FinTech. RegTech could provide a platform that takes away the pain, but could well require revolutionizing the way regulation is developed and implemented. FinTech and RegTech should go hand in hand in utilizing the technological and scientific innovations that can help the financial services industry rise up to the expectation of the customer. We intend to introduce the Engineering graduate to this platform of technologies where he/she has to learn/upgrade in order to be a part of the FinTech revolution.

It is generally opined that one of the most concrete ways to move forward in implementing a FinTech strategy is to put executives with strong technology backgrounds in leadership positions. Most of the experts in the financial services and technology sectors agree that Big Data and Analytics will have an impact on their business and operating models by helping them improve the customer experience through more personalized service. For this, the technologies having strategic importance are Cloud Computing, Automated Advisory Solutions, Internet of Things and Block Chain Technology.

Of these, Block chain is one of the most talked - about and rapidly expanding technology in the Financial Services (FS). The technology provides a number of benefits to the FS industry that include simplified ecosystem via common ledger, security from fraud and tampering of records, decentralized and transparent operations, increased speed and low cost of operations. A Block chain is essentially a distributed database of records or public ledger of all transactions or events that have been executed and shared among participating parties. Each transaction in the public ledger is verified by consensus of a majority of the participants in the system. And, once entered, information can never be erased. The Block chain contains a certain and verifiable record of every single transaction ever made. According to Marc Andreesen, the doyen of Silicon Valley's Capitalists, the block chain distributed consensus model is one of the most important inventions since the birth of the internet itself.

From a technical point of view, the block chain is an innovation relying on three concepts: peer-to-peer networks, public-key cryptography and distributed consensus based on the resolution of a random mathematical challenge. It's their combination that allows a breakthrough in computing strategy. The concepts of advanced cryptography, custom network protocols and performance optimizations are all too sophisticated to be redeveloped each time a project needs a block chain. Fortunately, there are several open-source block chain implementations of which Ethereum, Hyper ledger are widely used. However "eris" is the first application platform built to provide a logical base for developers and DevOps to build, test and run ecosystem applications with a block chain backend. The tutorials and explainers available at https:// monax.io (the company behind eris) is a resourceful starting point for an overview of block chain technology.

The Block chain technology is finding application in a wide range of areas - both financial and non-financial. The applications of block chain technology and their implementation are illustrated in the figure.



(Source: marmelab.com/blog/2016/04/28)

The technology has potential to become the new engine of growth in digital economy where we are increasingly using internet to conduct digital commerce and share our personal data and life events.

The crypto currency Bitcoin is the most popular example that is intrinsically tied to Block chain technology. The term 'Bitcoin' is an overloaded word and can mean several things

1. The protocol: The protocol is the specification of how to construct the distributed database (the Block chain), how to parse it, how transaction should be assembled, etc...

2. The network: This is a peer-to-peer network to which nodes connect. Nodes in this peer-to-peer network exchange messages containing new blocks being added to the Block Chain and new transactions being published.

3. The currency: A Bitcoin, usually spelled with lowercase 'b' is a unit of the native currency of the Bitcoin network.

4. The open source implementation: This is the original open source project, written in C++, implementing the protocol. The project was rebranded to Bitcoin Core.

In essence, Bitcoin is an Application Programming Interface (API) for money/value and Bitcoin the currency is an application. Bitcoin could be used as a protocol on top of which applications can be built and has the potential to become a platform for financial innovation as illustrated through Block chain Technology.

Educational institutions can help in the transformation of the finance industry by laying the academic and mathematical foundations for the use of Fintech in the area of Algorithmic Strategies, Risk Management and Investment Banking.

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Invited Article

Dr. Sitarama Brahmam G

Lead, Emerging Technologies Group,
IP &E Unit, Tata Consultancy Services Ltd., Hyderabad

Global Technology Trends for 2017

There has been a technology explosion in the last one decade resulting to a paradigm shift in the way organizations are doing business. Digital forces (Social, Mobile, Analytics and Cloud) have disrupted the business houses and forced them to come up with innovative approaches to out-perform competitors in the market. Knowingly or unknowingly, all of us are part of this transition; we have entered the digital era, crossed it and entered the post-digital era. Looking forward, in the post-digital era, CXOs of the IT industry shifted focus from maintenance and support of systems, to innovating and enabling business strategies. Companies no longer just serve customers; they collaborate with them. They no longer just compete with rivals; they partner with them. They're no longer limited by industry boundaries; they ignore them. The connecting tissue for all this may be digital, but the defining factor is people. The business objective of the organizations is to provide "right content to the right person on the right product at the right time at the right place through the right medium" and digital forces are the key enablers.

Though many technologies are expected to be in the focus, various industries are prioritizing few of them in order to stay ahead in the competition. We will here mention the technologies that are catching the attention in the IT industry.

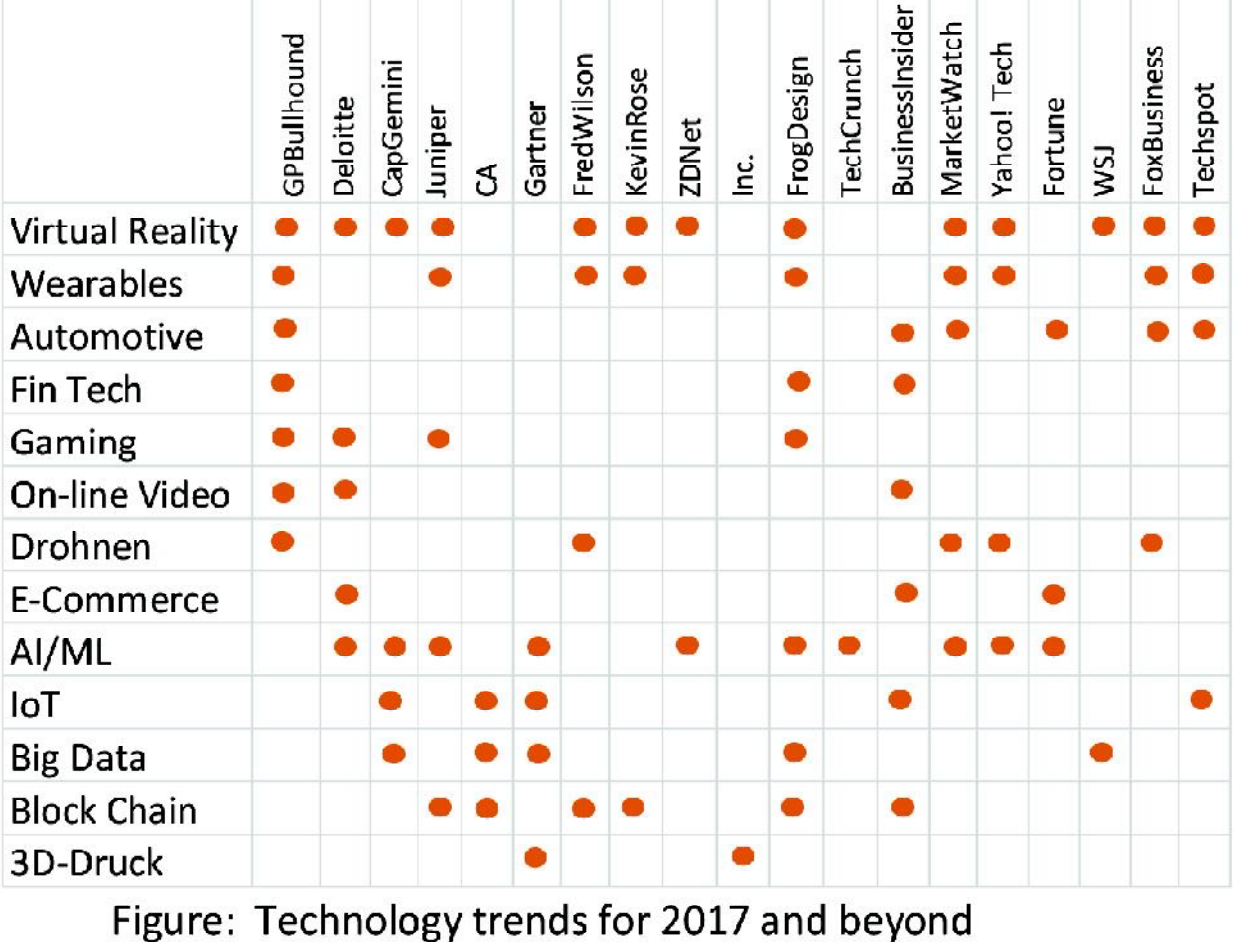
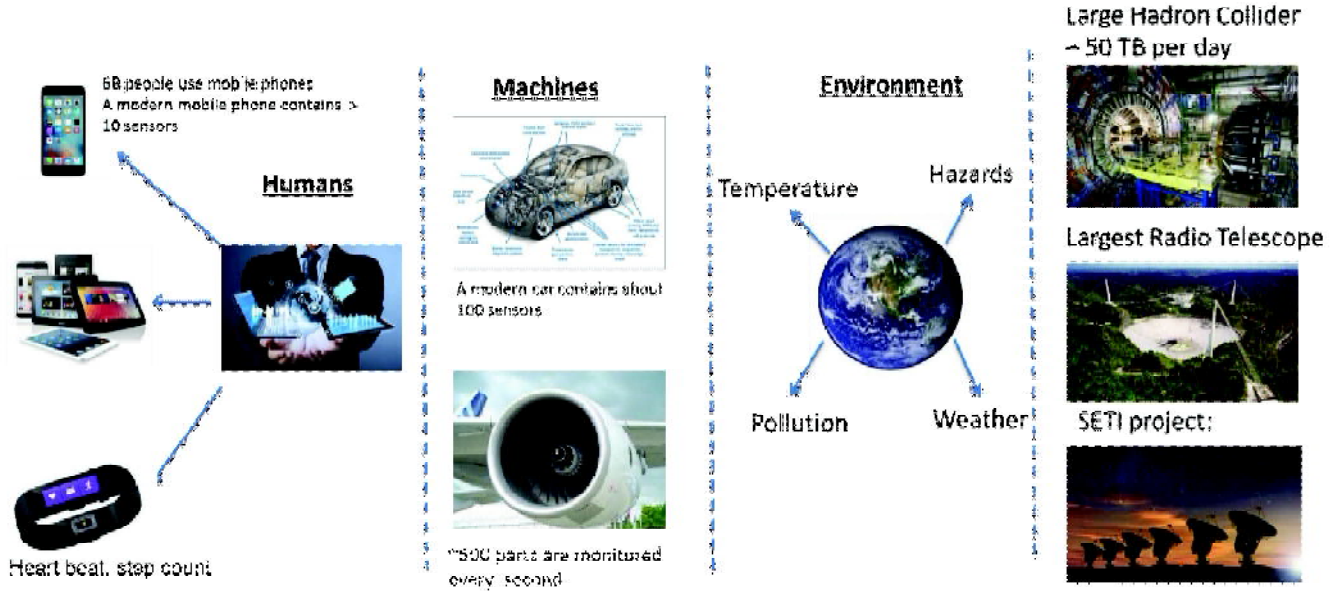


Figure: Technology trends for 2017 and beyond

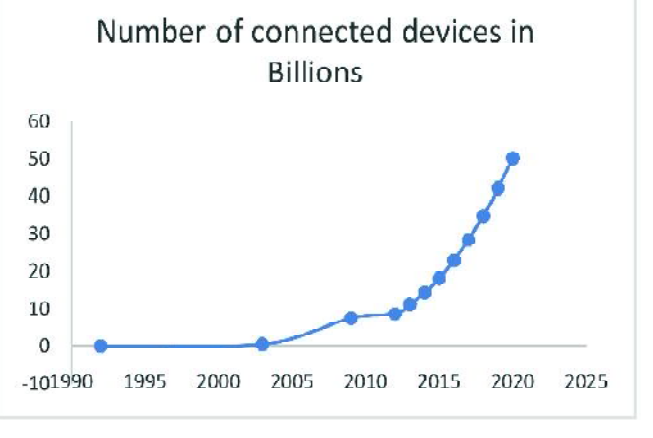


Internet of Things (IoT):

The Internet of Things (IoT) is the network of physical objects that contain embedded technology to communicate and sense or interact with their internal states or the external environment - Gartner's. These devices are connected with the Internet through uniquely identifiable IP addresses; whereby data is gathered and communicated via the embedded electronics and software, additional connectivity technologies and the cloud, networks or IoT platforms. The Internet of Things exists in many industries, applications and contexts. Some projects are still in the pilot stage while others form the backbone of important processes, operations and innovations. In other words: the Internet of Things is certainly here but the degree in which it is changing the ways we live, work and conduct business depends on the context.

IoTis already bigger than many believe and used in far more applications than those which are typically mentioned in mainstream media.At the same time it is true that the increase of connected devices is staggering and accelerating. As we write this, approximately each single hour a million new connections are made and there are about 5 to 6 billion different items connected to the Internet. By 2020, Cisco expects there will be 50 billion devices in the IoT.

With the increase in the number of connected devices, there will be flood of challenges and opportunities in the areas of data collection, data management, security, performance etc., Industry is gearing up for these challenges and it is expected that IoT will continue to capture the attention in the next 5 - 10 years to come.



Virtual Reality:

Virtual Reality (VR) provides a computer-generated 3D environment that surrounds a user and responds to that individual's actions in a natural way, usually through immersive head-mounted displays and head tracking - Gartner.

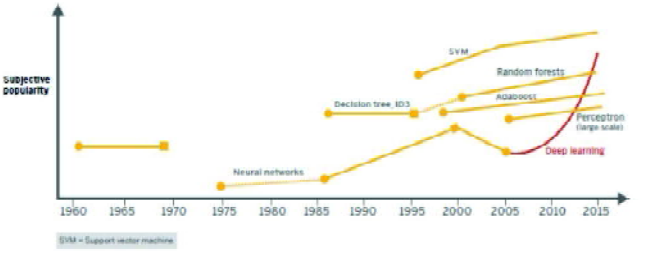
With recent developments in technology, VR has found applications in many business areas, such as,

Retail, Aerospace, Healthcare, Automotive. In the context of retail, with the accelerating advancement of Digital era, the e-shopping concept created a curiosity among the consumers to search for products, view details, write reviews most of all to buy real time. The mobile apps also stirred up the world wide e-tail growth. The SMAC stack (social, mobile, analytics and cloud) technologies enhanced the accessibility and consumer experience to the next level. Though the e-commerce has reached up to a saturation level, there is an increased number of consumers and the frequency of online shopping instances increasing exponentially. This growth will eventually lead to setting the consumer expectations much higher than ever before, be it the speed, fulfillment, delivery options and various other factors take the major share. Virtual Reality is on its way in helping the retailers to engage the consumers in an immense shopping experience. According to recent analyst reports, like, Gartner, Forbes, virtual reality would become ubiquitous for many industries in the upcoming years as they look for ways to reinvigorate the experience for consumers. VR enables the shoppers with a virtual tour experience and obtain additional product information with some demos which may not be available at a physical store.

VR is fast maturing and has shown great potential to be in the spot light among the emerging technologies in the next few years.

AI - Deep Learning:

Recently, deep Learning (DL), a new research area of machine learning has gained unparalleled popularity with the objective of bridging the gap between machine learning and artificial intelligence and taking them close to each other. DL, also referred to as "stacked neural networks"; that is, networks composed of several layers, is about learning multiple levels of representation and abstraction to get insights from data consisting of different types, such as, text, audio, video/images. It is observed that DL can solve problems that have resisted the best attempts of the artificial intelligence community for many years by discovering intricate structures in high-dimensional data and is therefore applicable to many domains of science, business and government. Deep neural network architectures differ from "normal" neural networks and machine learning approaches, such as, SVM, because they have more hidden layers and can be trained in an unsupervised or supervised manner for both unsupervised and supervised learning tasks.



DL has already attracted the attention of the industry and academia and there are several success stories in the literature are available. Interestingly, open source APIs (DeepLearning4J, TensorFlow)and Computing platforms such as, R, Python provide readymade solutions to explore and understand the principles and philosophy of DL. It is expected that DL will continue to dominate the technology maps in the next 5 years and provide exciting opportunities.

Analytics:

The field of analytics evolved over a period of time and this period of evolution has been divided into 3 different eras.

Era	Analytics Capability
Analytics 1.0	Business Intelligence
Analytics 2.0	Big Data
Analytics 3.0	Data Enriched Offerings

Today, billions of connected devices around us leave a data trail (also called as data exhaust) that i) is massive in volume ii) has many varieties (text, audio, video, etc.,) iii) is extremely volatile and iv) is very noisy. Practically, it is very challenging to move such large volumes to a centralized data store to perform analytics and to gain business insights. With so many

challenges of data, traditional way of doing analytics may not yield the desired insights.

These challenges triggered the evolution of Analytics 3.0 which is looked at as a combination of business intelligence, analytics, big data technologies and internet of things (IoT). Many organizations are getting ready for the requirements of Analytics 3.0 and it may take a while to realize the potential benefits.

Like the first two, the era of Analytics 3.0 brings new challenges and opportunities, both for the companies that want to compete on analytics and for the vendors that supply the data and tools with which to do so. How to capitalize on the shift is a subject we will turn to shortly. First, however, let's consider what Analytics 3.0 looks like in some well-known firms-all of which were decidedly offline businesses for most of their many decades in operation.

Block Chain:

Block chain is a distributed database that maintains a continuously growing list of ordered records called blocks. Each block contains a timestamp and a link to a previous block. By design, blockchains are inherently resistant to modification of the data - once recorded the data in a block cannot be altered retroactively.Blockchains are "an open, distributed ledger that can record transactions between two parties efficiently and in a verifiable and permanent way. Blockchains are secure by design and an example of a distributed computing system with high byzantine fault tolerance. Block chains are expected redefine and dominate the banking industry in the next few years.

To conclude, technology is changing rapidly and is one of the biggest influencers in our lives. This inter-twining is changing the way we live. But, change also creates an opportunity and there is good number of opportunities in the IT industry. Change is a continuous phenomenon and as Charles Darwin said, "it is not the strongest of the species that survive or the most intelligent, but the one most responsive to change".

About the Author

Dr.Ramabrahmam was born in East Godavari District of Andhra Pradesh, India. He obtained his master's and Ph. D degrees in Applied Mathematics from Andhra University(1989) and IITM - Chennai (1996) respectively. During the doctoral program, he studied the applications of wavelet based numerical methods to non-linear partial differential equations. During the period 1996 - 2001, he worked in Telecom and data warehousing projects of TCS. He joined DNAPrint Genomics Inc., a Florida based company in 2001 and worked in Bio-informatics. During this period (2001 - 2003), he was instrumental in developing the Ancestry Test kit and in solving the Human Eye Colour Classification problem". He was with the Life Sciences R&D Division, Innovation Labs Hyderabad, Tata Consultancy Services for many years and is at present the Lead , Emerging Technology Group, IP & E Unit, TCS Limited, Hyderabad.

Invited Article

Professor G. P. Raja Sekhar

Department of Mathematics, IIT Kharagpur

The Scientific World is Calling You!

The beginning of 90s, India witnessed so called revolution, which Academicians call it "Computer Science" or "Computer Applications" and industry call it "Software". While Academician's job is to learn and deliver various upcoming techniques and tools at a quick pace, the main task at software industry was to work on module based models and deliver them with deadlines. This was the time, not only these software companies pay hefty packages, but also had gone for dilution in the minimum level of education required at the entry level. Here goes, the first blow on the academic sector, where few of the experts who could not withstand the pressure of not being paid well at academia and got attracted towards hefty packages, made a vertical shift to the so called "Software industry" to try their luck. This continued for about ten years during which period, lakhs of young students across various disciplines tried their luck, of which some could succeed well and others burnt their fingers. However, on an average, majority of this migrated population got benefited financially, in particular those who have gone abroad on these kind of Software jobs. The other side of the coin is, there is a direct impact on the education system in India. It is not a surprise to know that there is no specialization left that is not being influenced by this mass migration.

Most of the educational institutes in the country including the premier institutes, where young minds are expected to come out with great technological thoughts and become integrated to the industry or academic sectors also suffered. The situation was not so much disappointing in this context until last ten years, when the "Software" got brothers and sisters, "Information Technology" "Financial Management" and "Data Analytics". The situation became worse when each and every individual was aiming to make a vertical shift by leaving the core fields. Of the disciplines that got affected by this scenario, Mathematics could be the one that is victimized at the most. The experience with young high school children proves this. The best part is these children were mostly exposed to Mathematics, Physics and Chemistry at their high school level and are not in a position on their own to really decide the kind of specialization they would like to study. However, these days technology transfers so fast, the environment responds faster and hence these school children also gets influenced quickly by the near and dear. As a result, all these young bright students, who are supposed to pause a while, think, enjoy the fun in learning and opt the field in which they are interested, could never do this. They just merely follow the so called "Technology Revolution" and end up with fields in which they are never interested. However, a part of this group knows the reality and tries to cope up with the field in which they get admitted and try to do their bit. But, the other part still lives in a virtual world and spoils their academics. These students are thinking "Core Fields" as "Bore Fields". In this midst, we, are becoming hybrid day by day and getting confused. The student community by and large stopped looking beyond to look for careers in Core Engineering fields at various industries or academia. This did not mean that one should not opt for Computer based engineering, rather, one should make use of the advancements in this field and aim high for new innovations. Neither the teaching community is an exception for this, as sometimes the system forces them to move away from core sectors and do for mere survival and sometimes on a compromise. Days are gone slowly, and boarders across various scientific disciplines are getting washed away. The innovations for the development of mankind demand a complete integration of knowledge across various fields. In spite of the fact that a majority of the scientifically educated population is draining out to non-scientific tasks, today the country's is proud to look at ISRO and its achievements. Such organizations are plenty in India, which expects your presence and contribution to

almost all the fields of science and engineering. Also, with the advancements in computational power, research in fields like Biology, Medicine has gone to a next level so that some challenges like controlling the growth of a tumor, operating complicated organs etc. has become possible easily. It is time for the young students to think a while and pick up your interest and take up scientific career, only then the quality contributions can take place. Since, you are one of those, please give a thought! Finally, Edward Lorentz's definition of Chaos: When the present determines the future, but the approximate present does not approximately determine the future.

About the Author

Dr.Raja Sekhar was born on 8th August 1970 at a temple village Simhachalam, which is in the district of Visakhapatnam in Andhra Pradesh. He completed his M. Sc. (Applied Mathematics) at Department of Mathematics and Statistics, University of Hyderabad (HCU) during 1990 -1992, where he continued for his M. Phil. (1993) and Ph. D. (1993 - 1997). He spent two years at Tokyo in Department of Applied Physics, Tokyo University of Agriculture and Technology (TUAT) on Japan Society for the Promotion of Science (JSPS) Post Doctoral Fellowship. He won the INSA (Indian National Science Academy) Young Scientist Award in 2002 and the Alexander Von Humboldt Fellowship for Experienced Researchers in 2008. He is presently working as Professor in the Department of Mathematics at IIT Kharagpur.

Article

Prof. B.S. Murthy

Professor, ECE Department

Are We Sure That We Are Earthians

(Based on Prof. Y. Nayudmma memorial award lecture delivered by Prof.J.V.Narlikar, on 01-03-2014, at TENALI,A.P)

Ever since man began to understand his existence, evolution and surroundings on this planet EARTH one thought that had been haunting the man is whether the planet Earth is the only habitat of living systems or are there any locations beyond Earth i.e., other planetary systems in our or other Solar systems of the Universe. Old folklores of various cultures all over the world have talked about Extra Terrestrials (ETs) and some of them even claimed to have seen and experienced those 'unidentified' objects. As those unidentified objects appeared to be ' Saucer ' shaped and reaching the earth flying from space they were called as 'Flying Saucers' - Unidentified Flying Objects (UFOs). To make the record of these observations and to establish a sort of communication anUFO project was launched in 1960's. This project recorded the evidences described by the people who claimed to have seen the UFOs in their backyards and other places and tried to establish a connection to know about their nativity. They were considered to be coming from other planets (Martians) and called them ETs. Unfortunatelynothing has come out from this project and the UFO project was officially closed in the year 2009. Interestingly, there are reports from Germany about the sightings of the UFOs in June 2014 also. The reason for the closure of the UFO project was probably the serious Science has kept aloof from these observations as there were no examples of hard evidence for making one believe in the existence of ETs. However, Astronomers are different sect of scientists. They are die hard optimists. They argue that with about 100 billion stars in our Galaxy and over several million galaxies in observable Universe , when an average star like our Sun can have a Planetary system(consisting of 8 planets orbiting round the sun with several satellites (moons) around the planets) it is more than probable that some stars to have planetary systems that might support life !

What sort of evidence that one requires, believing the existence of ETs? First of all one must prove the existence of complex life supporting organic molecules in the other planetary atmospheres of ours /other solar systems. How to detect the existence of these molecules in the atmospheres of other planets? Astronomers came up with some sort of evidence in 1960s with the development of 'millimeter' wave astronomy (See Box). They probed the Universe with millimeter radio waves which gave the evidence to the presence of clouds in the interstellar space containing molecules. The discovery started in a modest fashion with small molecules like hydroxyl, carbon monoxide and cyanogen's etc., but soon led them to find complex organic molecules of the kind found in the basic structure of life on earth. Then the question emerged was whether these molecules combined together to form the complete picture of life somewhere.

The 'somewhere' is expected to be a planet with eco-friendly atmosphere going round a star from which the life forms derive energy for their survival and progress. The evidence for planets around stars was missing for a long time before a break-through is achieved in 1990s when new optical techniques began to reveal evidence for extra-solar planets. Today more than several hundreds of them are known and some of which are ecofriendly.(NASA reported,in Feb.2014, over 700 new planets outside our solar system,some of which have features similar to earth). The stage is set for the Astronomers of the 21st century to make a scientific search for ETs.

There are some enthusiasts who have not waited for the above developments. They thought the best way of discovering technologically advanced ETs is through radio messages. A programmecalled Search forExtra Terrestrial Intelligence (SETI) was launched and is in operation for more than four decades. SETI programme relies on our receiving replies to messages sent usually on the 21 cm radio wave length band. Coded messages describing basic scientific information and facts about our existence on the Earth have been sent to locations

usually within a few tens of light years. The messages are not in any earthly languages but try to incorporate binary arithmetic and fundamental scientific facts. If 'They ' get our message and do think worthwhile to reply on the same system ,then their presence will be known to us and that will definitely be the most important discovery in the history of Human civilization on this planet. But the system requires patience. For e.g., if you send a signal towards a star 15 light years away , it means that travelling with the speed of light the signal will reach its destination in 15 years. Another 15 years for the reply to arrive (of course,if 'They'' wish to send reply only) and we have a full 30 years to wait for the response. In short, success is not guaranteed and even it does materialize, the entire project will have taken up a significant part of human lifespan.

Another approach , may not be as glamorous as SETI, involves searching for life in a microbial form Do cells , bacteria and viruses exist at heights of 40 -50 Km. above the Earth's surface? Two British astrophysicists Fred Hoyle and Chandra Wickramasinghe responded with a positive theory to the above question. They argued that microorganisms ride on comets in their frozen form,thus coming from vast interstellar distances. When the comet approaches the sun its outer layers evaporate and form a long tail. The microorganisms spread out and some get shifted to the tail. If the tail brushes the Earth's atmosphere,the microorganisms get transferred to it and then over the next 6-12 weeks they descend to the 'terra ferma '. Given that there are many cometary visits during the year, we can expect a flux of in falling bacteria,viruses etc., at considerable heights above the sea-level. This has led scientists all over the world to look for these microorganisms at 30-40 km. altitudes above the earth's surface, because at lower heights there is a danger of terrestrial contamination , say by earthly microorganisms tossed up by aircrafts, volcanoes, cyclones, etc. At heights far in excess of the above range, the probability of finding anything in the extremely rarified atmosphere is very low.

Indian Scientists from Tata Institute of Fundamental Research (TIFR),headed by Dr.J.V.Narlikarare the first to make a sincere effort to detect these microorganisms at 30-40 Km.heights. They had balloons capable of carrying scientific payloads up to41 km.height. They have approached Indian Space Research Organization (ISRO) for a research project which involve, sending scientific balloons into atmosphere for collecting air samples from specified height bands and examining them under aseptic conditions in biological laboratories. These balloons could be launched fromthe National Balloon Facility (see box), managed by TIFR at Hyderabad, located near the ECIL campus. The ISRO has sponsored two Balloon flights,one in 2001 and the other in 2005. Prof. Narlikar claimed that they got excellent data in 2005 flight. The air samples collected were examined at the Centre for Cellular and Molecular Biology Laboratory at Hyderabad and National Cell centre at Pune. In both cases they got evidence for live Bacteria at a height of around 41 km. They also observed that the bacteria showed survival ability against ultraviolet radiation. They wondered how long have those bacteria remained in high UV environment and could they have come from far away in space as Hoyle and Wickrama singhe suggested. May be yes!

Further studies are therefore are needed to confirm these ideas. If the composition of the bacterium collected, differs from the composition of the terrestrial bacterium, then that will establish the extraterrestrial origin. One way of testing the composition of bacterium is through nuclear isotope verification. The results or the outcome of these studies are very important ; for if the bacteria turn out to be extraterrestrial then it becomes possible to argue that life on earth itself may have been seeded by such showering microorganisms. That would make us all ETs!

Mm wavelength Astronomy: The visible spectrum is only a tiny portion of the Total Electromagnetic spectrum with gamma rays at shortest wavelengths to VLF radio waves at longest wavelengths. Optical astronomy sees the Universe through the visible spectrum. While TV and microwave signals are all light waves of relatively low energy,Ultraviolet, X-Ray and Gamma ray signals are high energy waves. They are capable of carrying

extremely high energy .When we look at the Universe in a different light , i.e., at non visible wavelength, we probe different kinds of physical condition of the Universe -for eg- Gamma-ray and X-ray tend to see most energetic dynamos in the Cosmos , such as active Galaxies, Supernovae, accretion of matter surrounding Black Holes etc. Long wavelength telescopes probe cool obscured structure in the Universe,dusty and star forming regions,dark cold, molecular clouds,the primordial radiation emitted by the formation of the Universe, shortly after the BIG BANG. By studying the astronomical objects at different wavelengths one can piece together a coherent comprehensive picture of the working of the Universe.

Sub mm wavelength (0.3 mm to 1 mm) is the least wholly unexplored wavelength portion of the spectrum. Why? Sub mm (microwave) astronomy is technically very difficult due to the sheer complexity of the instrumentation and to the opaqueness of the earth's atmosphere in the microwave light. The sub mm microwave band lies between the wavelength bands used by radio telescopes and optical telescopes. As such the techniques of sub mm radio astronomy borrowthe techniques of both optical and radio methods. Extremely sensitive and high frequency (800-1600Ghz) receivers are required for Sub mm studies. Secondly, ground based Sub mm observations are extremely difficult to measure as the atmosphere is opaque to these frequencies.

Ambient atmospheric water vapour absorbs (blocks) incoming sub mm microwave light, particularly at low elevations where most of the water vapour lies (= 40 km.).The abundant water vapour absorbs sub mm wavelength photons before they reach the ground based radio telescopes. At higher elevations the water vapour content decreases substantially .By minimizing the atmospheric water vapour;one improves the transparency of the atmosphere and makes astronomical observations possible. The Transparency (transmission efficiency) of the atmosphere at microwave frequencies is measured at two levels of PWV (perceptible water vapour). A 4mm PWV means if every molecule of water vapour above us is condensed into a Ocean, it will have a depth of 4mm.That ocean can be considered to be pretty dry. But even this atmosphere blocks 98% of light energy at 0.3 mm wavelength.(1Thz frequency). Moving to a dry site say 1mm PWV,only 75 % of sub mm light would be blocked. It is for this reason most of IR and sub mm astronomical telescopes are built as high as possible.(Space Shuttles carry these detectors).

National Balloon facility: Meteorological balloons are used all over the world for getting weather profiles up to stratospheric heights. These balloons made of rubber/polyethylene materials filled with Hydrogen gas carry weather and telemetry instrumentation and provide useful data for weather predictions.

Prof.HomiJ.Bhabha was the first to use stratospheric balloons,during 1940s,for cosmic ray measurements at around 25 km. altitudes. TIFR under the joint management with the ISROstarted the National balloon facility in Osmania University Campus;Hyderabad in the year 1959.The first research balloon was launched in 1961. With NCAR (USA), collaboration more than 170 balloons were launched in next 5years. This facility later moved closer to the ECIL campus.

The NBF activities include besides manufacturing scientific balloons, balloon based scientific experiments in X-ray, Infrared astronomy and Aeronomy. They conduct two balloon launches every year. On Jan.7, 2014 a 61000 cubic meter balloon made up of ultrathin polyethylene film of thickness 3.8 microns (human hair thickness is about 17 microns) weighing 31 kg was launched. It carried a pay load of 7.9 kg consisting of single card tele-command, Integrated electronic timer,radio transceiver, ATS transponder, mobile telephony, GPS-GSM for last leg tracking, Upward looking video camera two GPS sounds for navigation and measurement of atmospheric parameters like pressure,temperature and humidity and a 4.3 m diameter parachute weighing 3kg for the safe recovery of instrumentation after the flight .This has reached an altitude of 51.66km in about 2 hours. This achievement is a record of sorts for India as an indigenously made balloon for the first time reached Mesospheric height. Only USA and Japan earlier achieved it.

Article

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Secure Multiple Routing Configuration for Network Recovery

INTRODUCTION

As the Internet takes an increasingly central role in our communications infrastructure, the slow convergence of routing protocols after a network failure becomes a growing problem. To assure fast recovery from link and node failures in IP networks, this present a new recovery scheme called Multiple Routing Configurations (MRC). Our proposed scheme guarantees recovery in all single failure scenarios, using a single mechanism to handle both link and node failures, and without knowing the root cause of the failure. MRC is strictly connectionless, and assumes only destination based hop-by-hop forwarding. MRC is based on keeping additional routing information in the routers, and allows packet forwarding to continue on an alternative output link immediately after the detection of a failure. It can be implemented with only minor changes to existing solutions. The security is provided to the forwarding packets by applying encryption technique to it.

As the Internet takes an increasingly central role in our communications infrastructure a network failure becomes a growing problem. The objective of this project is to provide recovery in all single link and node failures in networks, regardless of whether it is a link or node failures.

The project is used in the LAN networks to send the packets from source to destination in a shortest path and it also provides fast and efficient recovery from single link and node failures by providing alternative path. The main idea used in this project is SecureMultiple Routing Configurations(SMRC).It is a proactive and local protection mechanism that allows recovery and provides security to the packets. SMRC allows packet forwarding to continue over preconfigured alternative path immediately after the detection of the failure. The IGP convergence process is slow because it is reactive and global. It reacts to a failure after it has happened, and it involves all the routers in the domain. This paper presents a new scheme for handling link and node failures in IP networks (Connection Oriented). Secure multiple outing Configurations (SMRC) is a proactive and local protection mechanism that allows recovery in the range of milliseconds.SMRCallows packet forwarding to continue over preconfigured alternative next-hops immediately after the detection of the failure.

SMRC guarantees recovery from any single link or node failure, which constitutes a large majority of the failures experienced in a network. SMRC makes no assumptions with respect to the root cause of failure, e.g., whether the packet forwarding is disrupted due to a failed link or a failed router.

MODULES

Topology Construction

In this module, This paper focus on construct a topology structure like mesh topology because of its unstructured nature. Topology is constructed by getting the names of the nodes and the connections among the nodes as input from the user. While getting each of the nodes, their associated port and ip address is also obtained. For successive nodes, the node to which it should be connected is also accepted from the user. While adding nodes, comparison will be done so that there would be no node duplication. Then areidentified the source and the destinations.

Message Transmission

In this module its transferred the message from source to destination. Here destination and selecting a shortest path for that destination is chosen. The shortest path is updated in the routing table. The source obtains the shortest path from the routing table itself. After receiving a message the destination will send an acknowledgement to the corresponding source.

Preventing Link Failure Using SMRC

As soon as the failure is detected SMRC System checks

the shortest path from the routing table. Then, the packet is transmitted from the source to the destination via that shortest path. Security is provided to the forwarding packets by applying encryption algorithms to it.

Existing System

Link and Node failures of IP networks are very common. To handle that IGP routing protocols like OSPF are designed to update the forwarding information based on the changed topology after a failure. The IGP convergence process is slow because it is reactive and global. It reacts to a failure after it has happened. For the existing system global routing information is needed.

Disadvantages

This network-wide IP re-convergence is a time consuming process and a link or node failure is typically followed by a period of routing instability. During this period, packets may be dropped due to invalid routes.

The IGP convergence process is slow because it is reactive and global. It reacts to a failure after it has happened. For the existing system global routing information is needed.

Proposed System

The main idea of SMRC is handling link and node failures in IP networks. Secure Multiple Routing Configurations (SMRC) is a proactive and local protection mechanism that allows recovery in the range milliseconds. SMRC allows packet forwarding to continue over preconfigured alternative next-hops immediately after the detection of the failure. It provides security as well as recovery in all single failure scenarios without knowing root cause of the failure. Each and every node having preconfigured backup path. That backup path maintains the routing table. SMRC assumes only destination of hop by hop forwarding.

Advantages

Secure Multiple Routing Configurations (SMRC) is a proactive and local protection mechanism that allows recovery in the range of milliseconds.

SMRC allows packet forwarding to continue over preconfigured alternative next-hops immediately after the detection of the failure.

MODULE IMPLEMENTATION

Topology Construction

This flow diagram provides the flow for Topology Creation in MRC System. The sequence of steps are provided below

- A Node is entered by the User using the Java Swing UI Front end
- Upon entering the node information, the system checks whether the node is present in the NodeInfo table or not.
- If the node is already present on NodeInfo, do nothing. Otherwise,
- Add the node to NodeInfo table.

Message Transmission

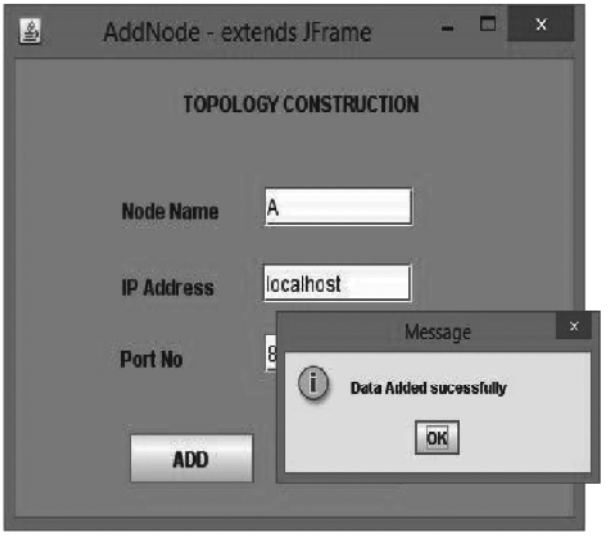
This flow diagramprovides the flow for Node Login in MRC System. The sequence of steps are provided below

- User enters a Node to be logged in as. This will be the source node
- Then, the user selects the destination node to where the message needs to be transferred
- With the Source Node and Destination Node, the MRC System computes the shortest path. This will make use of Paths Table
- Then, the message is transferred along the shortest path from Source to Destination.

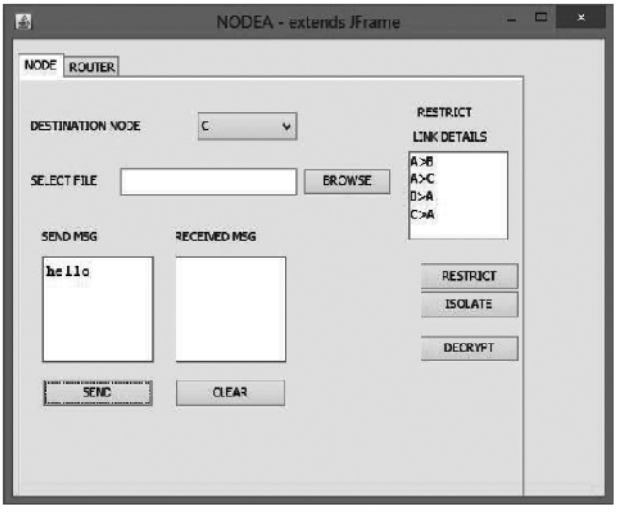
Preventing Failure Using MRC

This flowdiagram provides the flow for Preventing Failure using MRC System. The sequence of steps are provided below

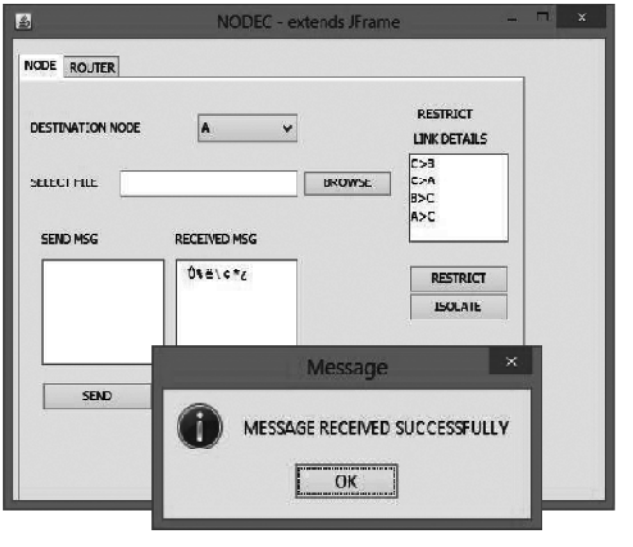
- Initially the screen for entering the node details is displayed. Here is given node information i.e., nodename, ip address and port number and click on the add button, a dialogue box is displayed with data added successfully.
- The number of nodes required is entered and then finish button is checked. The add node screen is closed and the new screen for adding the path details is displayed.

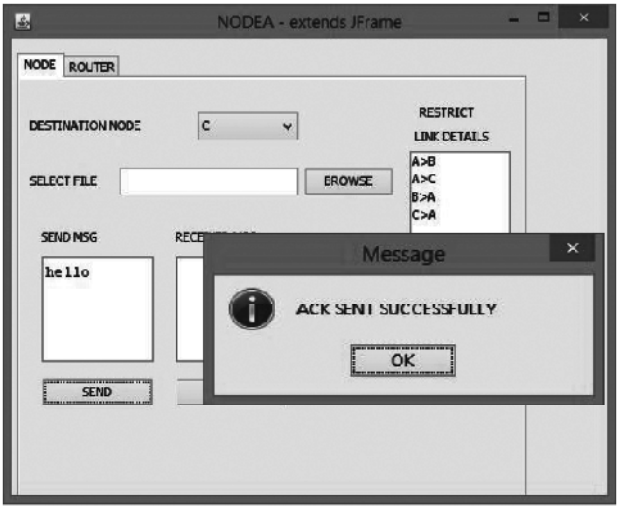


- User clicks on Send button to initiate the Message transmission in MRC System.
- MRC System then checks the Shortest path from the Paths Table
- Then, the MRC System checks whether the selected shortest path really exists or not?
- If the shortest path exists, Message is transmitted on that path
- Otherwise, an alternative shortest path is calculated and message is transmitted along that path.

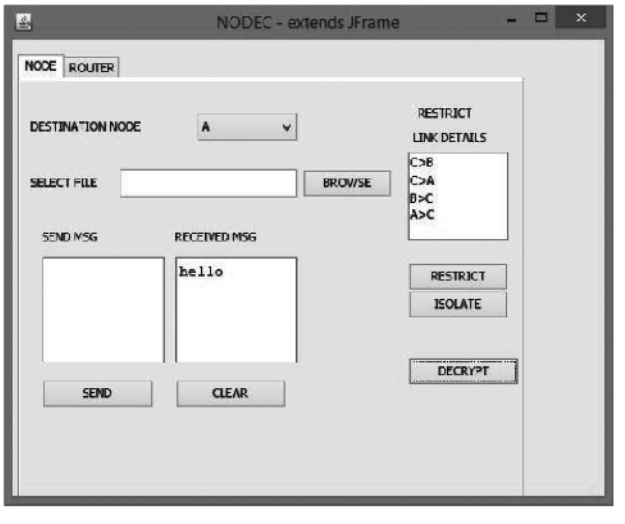


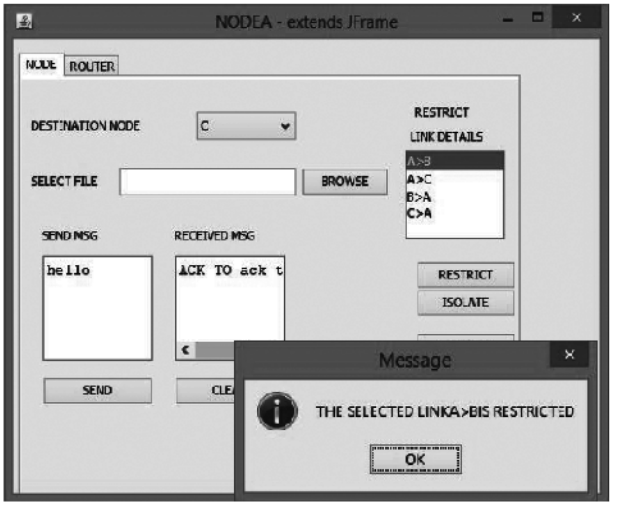
- Here we enter the path details and their corresponding weights and click on the create button then a dialogue box is displayed with the message data added successfully.
- In this way we give the paths and weights between the nodes and click on the finish button.
- The screen is closed and the server is run/started.
- Screen for NODEA is displayed on the client machine with the node, router tabs.
- The node tab consists of the link details of the corresponding node and the router tab consists of the possible paths to the destination.
- Here the destination node selected is C and the message HELLO to be sent is written in the send msg box.



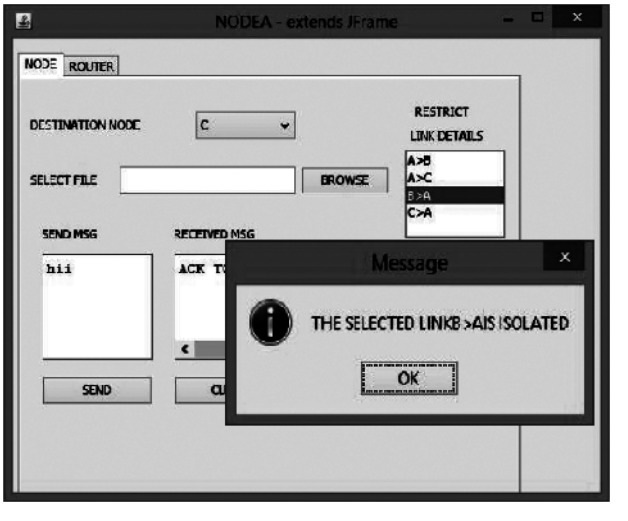


- On clicking the send button the msg is sent to C in an encrypted form.
- The message is received at NODE C in an encrypted form and a dialog box with message received successfully is displayed.
- On clicking on OK button acknowledgement is sent to NODE A indicating that destination received the message
- The acknowledgement is received from destination node C to source node A
- The message received from node A is displayed in the received message box at node C in an encrypted form.
- Now the message is decrypted by clicking on the decrypt button.





- The message is displayed at NODE C is the original message before encryption that was sent by NODE A.
- To restrict any particular link select the link from link details and click on restrict button.
- A dialogue box is displayed with selected link is restricted.
- To isolate any link click on the link that you want to isolate and then click on isolate button.
- A dialogue box is displayed with selected link is isolated.



Conclusion

Inthis paper, Secure Multiple Routing Configurations as an approach to achieve fast recovery in IP networks is proposed. SMRC is based on providing the routers with additional routing configurations,allowing them to forward packets along routes that avoid a failed component. SMRC guarantees recovery from any single node or link failure in an arbitrary bi-connected network. By calculating backup configurations in advance, and operating based on locally available information only, SMRC can act promptly after failure discovery. SMRC operates without knowing the root cause of failure, i.e., whether the forwarding disruption is caused by a node or link failure. SMRC thus achieves fast recovery with a very limited performance penalty. This system can be implemented in a real network to transfer the message in an predefined alternate path after a failure occurs.

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Article

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Security in Cloud Computing

INTRODUCTION

Cloud Computing security is the set of control-based technologies and policies designed to adhere to regulatory compliance rules and protect information, data applications and infrastructure associated with cloud computing use. Because of the cloud's very nature as a shared resource, identity management, privacy and access control are of particular concern. Cloud computing security processes should address the security controls the cloud provider will incorporate to maintain the customer's data security, privacy and compliance with necessary regulations. The processes will also likely include a business continuity and data back up plan in the case of a cloud security breach.

Security risks associated with the cloud computing

Loss of governance : In a public cloud deployment, customers cede control to the cloud provider over a number of issues that may affect security .Yet cloud service agreements may not offer a commitment to resolve such issues on the part of the cloud provider, thus leaving gaps in security defenses.

Responsibility ambiguity : Responsibility over aspects of security may be split between the provider and the customer, with the potential for vital parts of the defenses to be left unguarded if there is a failure to allocate responsibility clearly. This split is likely to vary depending on the cloud computing model used (e.g., IaaS vs. SaaS**).**

Authentication and Authorization : The fact that sensitive cloud resources are accessed from anywhere on the Internet heightens the need to establish with certainty the identity of a user - especially if users now include employees, contractors, partners and customers. Strong authentication and authorization becomes a critical concern.

Isolation failure : Multi-tenancy and shared resources are defining characteristics of public cloud computing. This risk category covers the failure of mechanisms separating the usage of storage, memory, routing and even reputation between tenants (e.g. so-called guest-hopping attacks).

Data protection : Here, the major concerns are exposure or release of sensitive data and loss or unavailability of data. It may be difficult for the cloud service customer (in the role of data controller) to effectively check the data handling practices of the cloud provider. This problem is exacerbated in cases of multiple transfers of data, (e.g., between federated cloud services or where a cloud provider uses subcontractors).

Malicious behavior of insiders : Damage caused by the malicious actions of people working within an organization can be substantial, given the access and authorizations they enjoy. This is compounded in the cloud computing environment since such activity might occur within either or both the customer organization and the provider organization.

CLOUD SECURITY GUIDANCE

This section provides a prescriptive series of steps for cloud customers to evaluate and manage the security of their use of cloud services, with the goal of mitigating risk and delivering an appropriate level of support.

1. Ensure effective governance, risk and compliance processes exist.
2. Audit operational and business processes.
3. Manage people, roles and identities.
4. Ensure proper protection of data and information.
5. Enforce privacy policies.
6. Assess the security provisions for cloud applications.
7. Ensure cloud networks and connections are secure.
8. Evaluate security controls on physical infrastructure and facilities.
9. Manage security terms in the cloud service agreement.
10. Understand the security requirements of the exit process.

In this article I want to focus on step 2 Audit operational and business processes

Audit operational and business processes : One of the biggest concerns with cloud data storage is that of data integrity verification .This technique ensures the

integrity of data storage in cloud computing. we consider the task of allowing a third party auditor (TPA), on behalf of the cloud client, to verify the integrity of the dynamic data stored in the cloud.

THIRD PARTY AUDITOR

The Third party auditor is a kind of inspector who has resources and experience that a user does not have and check the integrity that is difficult for users to check. The auditors can understand the threats and they know best practices. The released audit report helps the user to evaluate the risk of their services. It also helps the cloud service provider in improving their cloud platform.

There are three different network entities in cloud system, they are users, cloud service provider and third party auditor.

Users : These are active participants. They have data to be stored in the cloud and rely on the cloud for data maintenance and computation. Both individual consumers and organizations can be the users.

Cloud service provider (CSP) : It is the most important part of cloud architecture. It has significant storage space and computation resource to store and maintain the user data.It provides all its services in pay per use manner.

Third party auditor (TPA) : It has more capabilities than the user and checks the integrity of data for the user and his audit reports helps the users in evaluating the risk.

FUNCTIONS OF THIRD PARTY AUDITOR

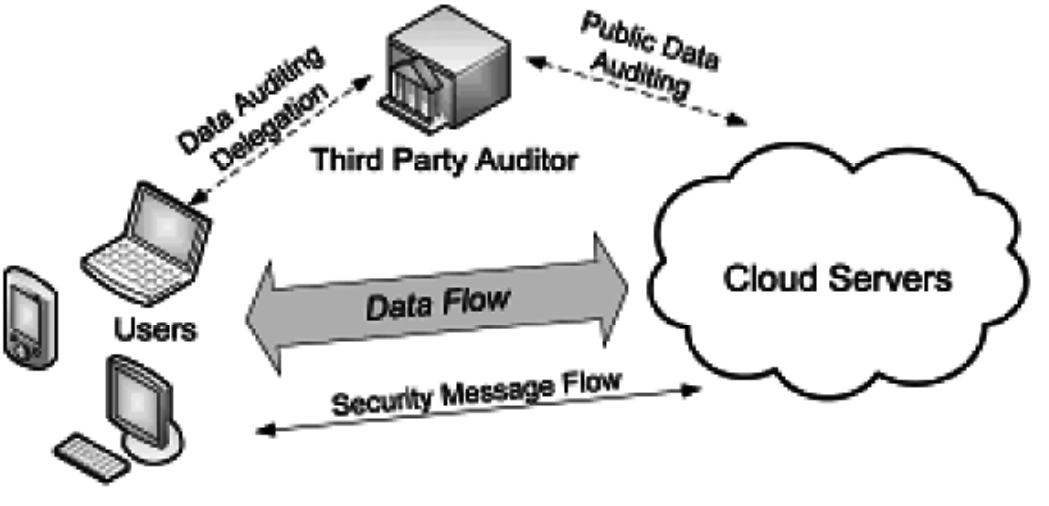
No data leakage or data learning : TPA should neither learn any information about the data file from the message it receives from client/server nor leak the same to any unauthorized entity.

Audit without downloading : The TPA should audit without asking for entire file from server, not even in encrypted form. TPA should audit the user data without asking for the local copy of the data or even learning the data contents.

Integrity Verification : One of the important security concerns is to verify integrity of data stored on cloud. TPA should verify the integrity of client's data stored on cloud with low communication overhead.

High Performance : Performance of TPA is also an important issue as it is a central component of the cloud system, where there are thousands of client and multiple servers. TPA should not become bottleneck of entire system and performance of overall system should not be compromised due to heavy load on TPA.

Scalability : As cloud is a completely dynamic environment, any number of users can come in or go out. Also it is expected to have huge data storage on cloud server. Functionalities of TPA should not be affected by number of cloud clients, servers, number of data files stored on the cloud or the overall size of the entire storage. TPA should offer scalable architecture which is independent on all the factors mentioned.



Dynamic data operation support : One of the main differences between the cloud computing and other online storage system is its dynamic data support & sharing. TPA should take the fact into consideration that the data stored on cloud may be used & edited by multiple users simultaneously. It must support dynamic operations on data blocks i.e. data update, append and delete.

Batch Auditing : Third Party Auditor also supports batch auditing to improve efficiency. TPA performs multiple auditing tasks simultaneously and it also reduces communication and computation cost.

DIFFERENT SCHEMES USED FOR TPA

. MAC Based solutions
. Public Auditing Scheme for Third Party Auditor
. HLA based solution
. Privacy- Preserving Public Auditing Scheme
. Digital signatures based solution.

In this article, I want to focus on Public Auditing Scheme for Third Party Auditor

PUBLIC AUDITING SCHEME FOR THIRD PARTY AUDITOR

The working of TPA consists of four algorithms: Keygen, Siggen, Genproof, Verifyproof.

Keygen : Key generation algorithm is run by the user to setup the scheme. In this the user generates his own public/private key pairs.

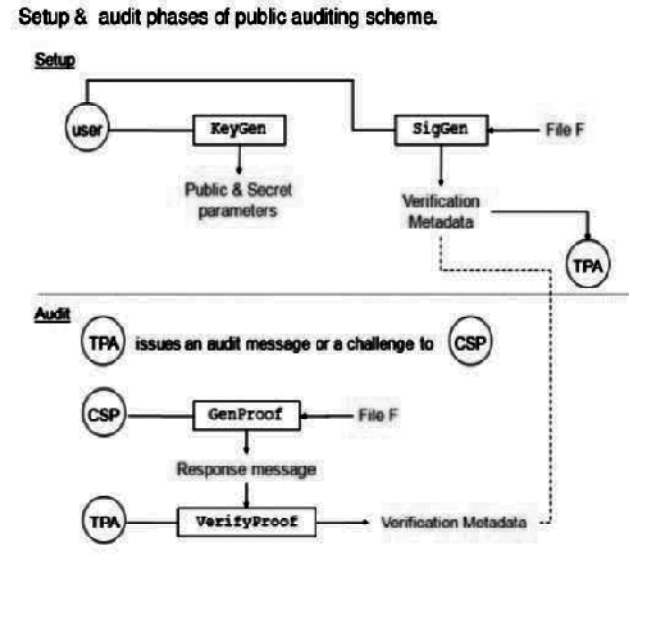
Siggen : This algorithm is run by the cloud user for the generation of verification metadata, which can be signatures or other information used for auditing.

Genproof : This algorithm is for the generation of proof of correctness of data storage and is run by the cloud server.

Verify proof : This algorithm is run by the tpa for the auditing of the proof generated by the cloud server. It is divided into two phases: setup and audit phase.

Setup phase: The user initializes the public and private parameters of the system by executing keygen and preprocesses the data file by using siggen to generate the verification metadata. The user then stores the data file at the cloud server, delete its local copy, and publish the verification metadata to TPA for later audit.

Audit phase: The TPA issues an audit message or challenge to the cloud server to make sure that the cloud server has retained the data file properly at the time of the audit. The cloud server will derive a response message from a function of the stored data file by executing genproof. Using the verification metadata, the TPA verifies the response via verifyproof.



CONCLUSION

Cloud computing provides many benefits to its users but security is major issue in cloud computing. Users store their data to cloud data centers but as user does not know the exact location of their data so integrity of data is very important. To check the integrity of data there are many solutions available. One of the solutions is to take the assistance of a third party auditor

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Know a Scientist

JOHN von NEUMANN

Great Philosophers,Mathematicians, Scientists, Statesmen, Politicians, Artists Sportsmen and many more with their sheer brilliance in their respective fields have contributed to the Modern World in a way that the Humanity around them immensely benefitted and shaped their lives with the fruits of the legendary achievements. John von Neumann a Hungarian born American Mathematician stands tall among the Legendaries of the Modern World.

Born in 1903 in a Jewish family at Budapest,Hungary John von Neumann grew from a child prodigy to one of the world's foremost Mathematicians by his mid twenty's. At the age of 6 he could multiply two eight digit numbers in head and could converse fluently in Greek. Learned languages and mathematics from tutors and went to the most prestigious school in Budapest. He developed passion for Mathematics from a very early age, but his father, Max Neumann, being a banker, advised his son to take other subjects ,as mathematics might not make him earn more money. As a compromise,John Neumann pursued Chemistry and Mathematics simultaneously. He got his first degree in Chemical Engg.in 1925 from Swiss Federal Institute, Zurich and Ph.D in Mathematics in 1926 from Univ.of Budapest.

John von Neumann commenced his intellectual career under the influence of David Hilbert (Hilbert Transforms) and establishing axiomatic foundations-transfiniteordinals. The definition of conventional ordinal numbers given by him in his mid-twenties – namely- as the set of all small ordinal numbers- is being followed even today!. He continued his postdoctoral work under Dr.Hilbert at Univ. of Gottingen, Germany, where he has developed interest in Quantum mechanics. John Neumann published a book –Mathematical Foundations of Quantum Mechanics- (1932) in which Quantum States are treated as Vectors in Hilbert's space. Niel's Bohr and Heisenberg appreciated John's work but Albert Einstein had some reservations.

Neumann moved to Princeton in 1930 and became a Professor in Mathematics in 1933. Von Neumann produced succession of pivotal papers in Logic ,Set theory, Group theory, Ergodic theory, automata, measure theory, Lattice theory Operation theory, Functional Analysis, continuous Geometry, Computer Science Hydrodynamics (of explosions) statistics and Game Theory. Along with Osker Morganstern von Neumann published a paper on "**Theory of Games and Economic behavior**", considered to be magnum opus. At Princeton, he became a legend and a member of the Institute of Advanced Study (IAS), the member of one of the six 'demigods group' of which Albert Einstein is one among them. He used to play practical jokes on Einstein .He could recite books verbatim and could edit Assembly language computer code in his head. Never much like the stereotyped mathematician, he was known as a wit, bon-vivant and an aggressive driver. One of the Princeton intersections was named as von Neumann's corner because of his frequent accidents he made at that place.

During 1944 to 1951 von Neumann's publications on Computer design established the merit of single Processor Stored programme Computer- an architecture now known as vonNewmann architecture. Along with AllanTuring and Claude Shannon he was responsible for the invention of stored programme Digital computer.

During World War II he was involved in the Manhattan Project, closely associated with Oppenheimer and Neddermeyer. He provided the required mathematics for the atomic bomb (implosion technique). Also along with Edward Teller and StanislowUllamvon Neumann worked out the key steps in thermo nuclear reaction and the Hydrogen bomb.

John von Neumann breathed his last at an age of 53 (1957 Feb.).With his pivotal work on Quantum theory, the atomic bomb and the Computer von Neumann exerted greater influence on the Modern World than any other mathematician of the 20th century.

John von Neumann's Contributions

Mathematics	:	Foundations of Mathematics, Functional analysis, Lattice theory, Geometry
Physics	:	Quantum Mechanics, Hydrodynamics and Fluid Dynamics.
Economics	:	Game Theory
Statistics	:	Ergodic Theory.
Computing	:	von Neumann Architecture, Linear Programming, Self-Replicating Machines, Stochastic Computing

Famous Quotes of John von Neumann

"Truth is much too complicated to allow anything but approximation"

"In Mathematics,you don't understand things.You just get used to them".

"If people do not believe that mathematics is simple,it is only because they do not realize how complicated life is."

"There is no sense in being precise when you don't even know what you are talking about."

"Anyone who attempts to generate random numbers by deterministic means is,of course livingin a state of sin."

"There probably is a 'God'.Many things are easier to explain if there is than if there isn't."

What Great Scientists have said about Neumann:

I have sometimes wondered whether a brain like von Neumann's does not indicate a species superior to that of man.

- Hans Bethe

Fastest Mind

- Paul Samuelson

Cleverest man in the world.

- British NPL

Wigner compared von with Einstein:

Einstein's understanding was deeper than von Neumann's.His mind was both penetrating and more original than von Neumann's.

Once there was a survey conducted in USA about who can be considered as **'The FATHER of COMPUTER'**, and the options given were:

1) Charles Babbage
2) Von Neumann
3) Allan Turing

A great majority voted **John von Neumann**!

Polymer - Based Transistors Bring Fully Stretchable Devices Within Reach

(Source: Physics Today, March 2017- A Publication of American Institute of Physics)

ZhenanBao wants to give robots the sense of touch The Stanford University professor is among a contingent of materials scientist, chemists, and engineers who have been working to develop stretchable electronic materials that could serve as artificial skin for robotics. Such material could benefit people too, as medical sensors that can be worn like temporary tattoos or as implantable devices that could,say monitor an internal organ without inhibiting its function.

Now Bao and her coworkers have reported their biggest advance yet in the pursuit of stretchable electronics: They've demonstrated a method for fabricating polymer films that are both stretchable and good semiconductors, the group found success with five semiconducting polymers,all paired with the same polystyrene polybutylene elastomer. In their upstretched states, all five films exhibited electron motilities on par with those of their pure, conventionally prepared counterparts;in four of the five,motilities exceeded $1cm^2/V.s$. But unlike the conventional films, the composite films could be stretched to double their length with virtually no loss in electron mobility.

Graphene Could Buttress Next-Gen Computer Chip Wiring

(Source: IEEE Spectrum, March 2017)

Current can literally blow copper interconnects away, but graphene could keep them intact

Most of the hand-wringing over the fate of Moore's Law focuses on the ever shrinking silicon transistor. But increasingly researchers are concerned with another critical part of the infrastructure: the copper wires that connect individual transistors to form complex circuits.

Copper wires are getting so thin, and must carry so much current, that the atoms in the wire can literally get blown out of place. "The electron wind can physically move the copper atoms and create a void," says Wong. Growing graphene around copper wires prevent this, according to research that Wong's group presented at the meeting. It also seems to bring down the resistance of copper wires.

At-Home Electric Headband For Depression Could Go Mainstream

(Source: IEEE Spectrum, March 2017)

A consumer-friendly gadget could help tDCS treatment catch on

A doctor's prescription for clinical depression could one day sound like this: In the comfort of your own home, slip on a brain-zapping headband a few times per week. For 20 minutes, it will send a tiny stream of electricity through your brain.

The treatment is delivered by a user friendly type of brain stimulation called tDCS (TranscranialDirect-Current stimulation). This mind altering technique has become a hot topic in neuro-science research over the last decade, and it's now beginning the transition from lab to doctor's office.

tCDS is considered an exciting new possibility for clinical use because the gear is cheap, portable and easy to use. The headsets press electrodes against particular locations on the scalp to channel a few milliamperes of current through a specific brain region, and they can be powered by a 9-Volt battery

Trending Article

B. Kroposki et al.

(excerpt from Power and Energy Magazine,15(2) April 2017, 61-73)

Achieving a 100% Renewable Grid

Around the world, most good sites for large hydropower resource have already been developed. So how do other areas achieve 100% renewable grids? Variable Renewable Energy (VRE), such as wind and solar Photo Voltaic (PV) systems, will be a major contributor, and with the reduction in costs for these technologies during the last five years, large-scale deployments are happening around the world.

Wind and solar power are different from most thermal generators because they have variable and uncertain power output determined by local weather conditions. Conventional generators, such as coal and gas plants, are considered dispatchable because they can more easily change their power output (both up and down) to meet changes in load. As the penetration of VRE increases within a system, many factors require greater grid flexibility to accommodate the changes in generation. PV power , in particular, has a natural challenge associated with its diurnal cycle because it does not produce any power during the night. This makes the power output between individual PV generator very well correlated , with large amounts of energy in relatively small window of time .this can lead to larger net load ramps than might otherwise be seen in the evenings.

Wind energy also has a diurnal cycle, albeit one that is less pronounced than that for PV power. In many locations wind power can also produce ramps in power output when there are large changes in weather conditions across large geographic areas. Generally, these ramps tend to occur during multiple hours when there is a sufficient amount of geographic diversity in the wind power resource.

A technology that allows for the temporal shifting of VRE is energy storage. Energy storage has value in the power system at many timescales, the most important of which is in shifting wind and solar power from times when it might otherwise be curtailed to times when the power output of VRE is lower than current demand.

Achieving 100% VRE grids will require

- better ways of matching supply and demand over multiple timescales
- significant curtailment
- proper operation with very high instantaneous penetration of VRE

As ac power system evolves from synchronous generator dominated system to inverter-dominated ones, we must ensure that these technologies operate in a compatible manner.

This includes designing inverter-based system to provide system stability and additional grid services necessary for proper ac power system operations.

Renewable Grid @ GVPCEW

D.Srinivas Reddy* A.S.V. Vijaya Lakshmi**

* Assistant Professor, EEE Department

** Assistant Professor (Incharge HOD), EEE Department

Our Experience @ IIT Kanpur

We attended the " International workshop on cyber physical systems and a short course on control of cyber physical systems" held during March 20-26,2017 in the Department of Electrical Engineering at the Indian Institute of Technology, Kanpur, U.P., India. Ministry of Human Resources development has set up a Teaching Learning Centre for Internet of Things at IIT, Patna under PanditMadan Mohan Malviya National Mission on teachers and teaching in association with IIT, Kanpur, IIT Kharagapur and IIT Indore.

The objective of the workshop was to provide a comprehensive PG level course package in this short course on control of cyber physical systems, with a course module of 40 lecture hours. Prof. SandeerShukla delivered his first lecture on how cyber physical system has evolved and an overall view on cyber physical systems by stating that "Cyber-Physical Systems (CPS) is engineered systems that are built from, and depend upon, the seamless integration of computational algorithms and physical components. Advances in CPS will enable capability, adaptability, scalability, resiliency, safety, security and usability that will far exceed the simple embedded systems of today. CPS technology will drive innovation and competition in sectors such as agriculture, energy, transportation, building design and automation, healthcare, and manufacturing". Few examples for Cyber Physical System (CPS) are smart grid, smart city, smart home and assisted living, smart car, autonomous vehicles, networked systems of robots, UAVs, and unmanned cars. Workshop also included lectures on switching systems, hybrid systems, networked control systems, quadrotor design, modeling and control, state estimations, graph theory, effect of time delay on consensus, collision avoidance and formation control. During this whole short course we had been given lectures by experts in this field and the topics were of both basics and applications. The Workshop emphasized the importance in developing science and technology concerning this emerging field. This signifies the importance of this CPS system both in terms of technological impact as well as underlying scientific knowledge creation. They also presented live projects and explained about the challenges they faced to overcome it.

On 24th March 2017, International Workshop on CSP was inaugurated. It focused on the challenges in designing CPS like Smart Grid, Multi Robot System coordination problems, how safe our critical infrastructures are from cyber-attacks, UAV path planning in urban environments, their experiences at Amazon picking Challenge 2016 etc. Panel discussed the key issues of the workshop by having Master's program on IOT. Feedback form from the panel committee and the participants about the eligibility conditions and curriculum of this course were taken. This workshop illuminated us about the emerging nature of this topic in terms of research issues, applications and technological opportunities. We thank our Principal Prof. K.A. Gopala Rao, Vice Principal Prof. G. Sudheer and the Management for their encouragement and support, without them it would not have been possible for us to attend this course and interact with national and international experts in this field.

Faculty

Ms. A.S.V. Vijaya Lakshmi

Mr. D. Srinivas Reddy

Technotsav 2K17

Celebrating Technology

Technotsav – 2K17 Is A Student Level Technical Fest Conducted on 16th - 17th March 2017, by Gayatri Vidya Parishad College of Engineering For Women. Various Technical events like:

- Paper Presentations
- Hardware Expo
- Technical Workshops
- Game'oMaina

Around 400 students have participated enthusiastically in various activities. The event has been inaugurated by Smt **Ch V S Sudha**, Scientist '**F**', Head, Software Division, NSTL, in the august presence of **Sri A S N Prasad** (President, Gayatri Vidya Parishad), **Dr P Somaraju** (Secretary, Gayatri Vidya Parishad). She delivered inaugural lecture on "Embedded Systems and its simulation in Torpedo Applications" which captivated the spectators.

The valedictory was graced by **Sri A V Balaji Kumar**, (Engineering Manager, Chegg Inc., Vizag) as Chief Guest and **Sri P Raghuveer,** (Sr Director, Inside Sales, OpenLogix, USA) as Guest of Honor. The cultural activities were performed by students which enthralled the audience and brought out the latent talents of the **students**.

Alumni Speak

If we can do it, you can too..

Sandeep Kaur
Software Engineer, IBM

We all have heard about that "impossible word is not there in any dictionary". But for me it was there in my dictionary till the time I joined GVPCEW. Our institute taught me that if you set your mind to do anything, you will reach your goal at any cost. As per my understanding, all the GVPCEW girls working, studying or married around the world are being loved by all whoever they meet because of the discipline that has been inculcated at the college level. I want to thank all our college Professors and especially Mr. BhaskarSarma Sir, Mr. Sudheer Sir and Mr. Vasu Sir- you all are always the pillars of our college and for our future. They have supported us in all aspects pertaining to studies or sports. So, dear girls, be patient andwait for your great future ahead that GVPCEW is building for you.

It gives me great pleasure to say with pride that I have completed my graduation from GVPCEW. I think GVPCEW is not just a place to earn a degree but to be groomed holistically. I have acquired a lot of confidence through various platforms provided by the college.I am glad that GVPCEW gave me an opportunity to undergo opportunities for developing my interpersonal skills through weekly seminars, club activities and cultural fests which are add-ons that played a significant role in shaping my confidence.This is a glorious moment for me when I am writing few words about my college. And, I would like to thank the GVPCEW family for being so supportive throughout my journey in the college.

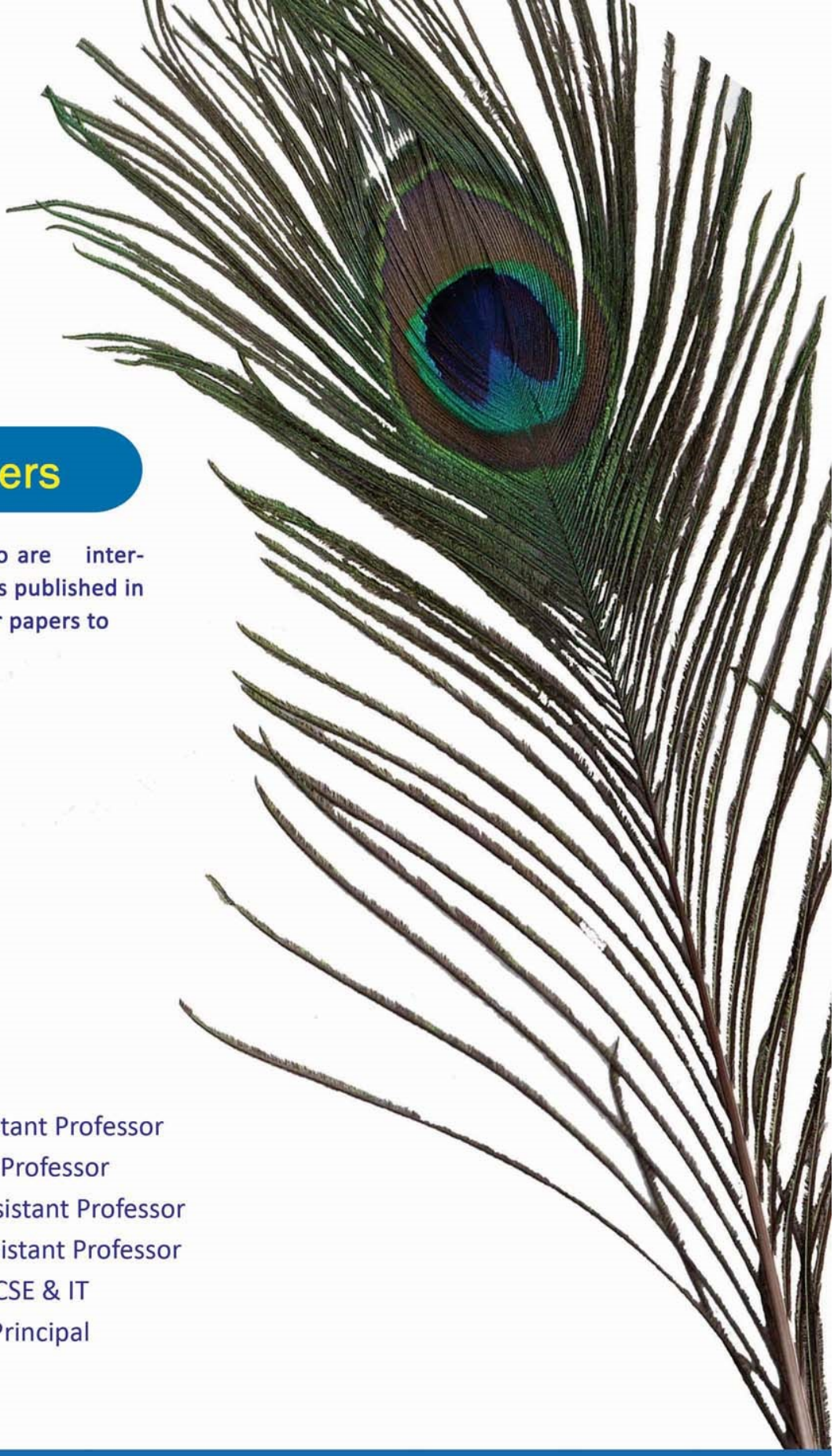
Anusha Aidam,
Team Lead, Ray Business Technologies

Medida Devi Prasanna
Assistant, Reserve Bank of India

The days spent in GVPCEW are the best that has ever happened to me.This divine institution has not only helped me in imbibing knowledge but also in developing my overall personality. It acted as a catalyst in the process of building my confidence. My sincere and humble thanks to all my Gurus, mentors and friends in GVP family for their support and altruism. They have played a very crucial role in shaping me into an independent woman and I am proud that I chose the right path in selecting GVPCEW over other colleges.I'm carrying along with me beautiful memories of this place and will always cherish them. Thank you GVPCEW for making my journey so pleasant.

Belonging to the first batch of Biomedical Engineering in Visakhapatnam had its share of cons, but looking back, I now realize that the zeal to pursue such a profound branch of Engineering can be attributed to the wonderful faculty of GVPCEW who constantly encouraged me. College is a place which gives plethora of opportunities, we need to take a chance to identify ourselves in order excel in whatever domain we choose to make a career in. After getting an MS from Arizona State University, I currently work with a company that designs novel material substitutes for wound healing. I will be heading out for a PhD soon. GVPCEW has instilled in me discipline, determination and strong basics - values that will forever ensure my success in this field. Proud to be a GVPCEW alumnus!

Chitra Meduri
Jr. Scientist, R&D, Axio Biosolutions Pvt Ltd,



Call for Papers

The faculty or students who are interested in getting their articles published in the magazine can send their papers to editor@gvpcew.ac.in

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