



MANAV RACHNA INTERNATIONAL INSTITUTE OF RESEARCH AND STUDIES

(Deemed to be University under section 3 of the UGC Act 1956)

FACULTY OF ENGINEERING AND TECHNOLOGY

Department of Computer Science and Engineering

(December - 2017, Issue-2)

**CREATIVE
BYTES**

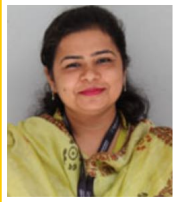
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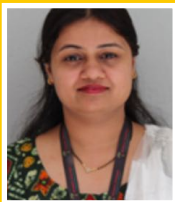
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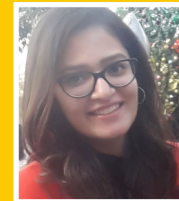


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Mr. Prashant Dixit
Assistant Professor, CSE

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3rd Year



Ms. Mahima
2nd Year



Mr. Tekender
3rd Year

Message from Head of Department



It gives me immense pleasure to head the department of Computer Science and Engineering in FET, MRIIRS Faridabad. I have been a part of this department for almost 17 years. I have witnessed the way CSE has grown over the years and now being the head of the department, every achievement brings a feeling of pride to me. The year 2017 has proved to be another year of achievements in many technical areas. Our department has once again obtained maximum number of admissions this year. Also our students have been placed in several renowned companies, which itself justifies the excellence of department. We have been updating ourselves with the changing requirements of the industry by providing specialized courses in engineering like Cloud Computing, Cyber Security and Forensics, Graphics and Gaming in collaboration with IBM. We have well equipped lecture halls and laboratories with various latest softwares to facilitate our students and faculty members. The department is enriched with highly qualified faculty members with excellent past experience.

To brief about the year 2017, a number of events were organized by the department in which various esteemed guests from different organizations were invited to share their knowledge and upgrade the skills of our students and faculty members. The year commenced by celebrating IBM day in which various delegates from IBM addressed the students. Some of our bright students published their research papers on the topics like Android Operating system, Natural language processing, IDPS etc. A few of our faculty members and students visited the International book fair to explore the latest books on various subjects under our courses. National Voters day was celebrated in the campus for spreading awareness among our students regarding effective participation in the electoral process, by informing them about the significance of voting in shaping the future of our country and how it helps us choose a representative who fulfills our requirements and serves the community. The department invited some of its alumnus to interact with our students who shared the strengths of the department and the institute. An online FDP on Experiential, project-based learn-by-doing learning approach using Java Programming

was conducted by Prof (Dr) Lynn Carter, from Robert Carter Academy, USA in which some of the faculty members and students participated and learnt the methodology to develop software with a test driven approach. This year several webinars were organized for our students on Data mining, Operations research, IT data security and Cloud computing. The department organized a 2-day National Conference on Networking, Cloud computing, Analytics and Computing Technology which aimed to encourage development and promote scientific information exchange between faculty, researchers, engineers, students and practitioners working in India as well as abroad, in the field of “Networking, Cloud Computing, Analytics and Computing Technology”. Short term course on “Artificial Neural Network and Fuzzy Logic through ICT” was conducted which was delivered by the faculties of National Institute of Technical Teachers Training and Research, Chandigarh. CSE in association with IEEE CS Chapter Delhi Section, celebrated the 8th IEEE Day which saw an active participation from the students and faculty members and an impressive roster of distinguished speakers, from institutes such as DRDO, DST, Quality Council of India, IIT Delhi, Indira Gandhi National Open University (IGNOU), Indian Statistical Institute (ISI), etc.

Dr. Suresh Kumar
HOD - CSE



VISION

To empower the graduates to be technologically adept, innovative, self-motivated and responsible citizens, possessing human values and contribute significantly towards being a center of excellence in providing globally standard education, through a conducive Teaching and Research environment, that responds swiftly to the challenges of the ever changing world.

MISSION

To achieve academic excellence by imparting in-depth knowledge to the students through effective pedagogies and hands on experience on latest tools and technologies.

To pursue interdisciplinary research that will serve the needs of the entire global community.

To prepare students to be continuous learners in a connected world and imbibe professional skills and ethical responsibilities in them.

To strengthen the Industry-Academia interface that will help the graduates to emerge as leaders in academics or an inspiring revolutionary in entrepreneurship.

PROGRAMME EDUCATIONAL OBJECTIVES (PEOs)

PEO-1: To prepare the graduates for a successful career in industry, consultancy, teaching and allied areas related to the subjects of Computer Science and Engineering.

PEO-2: To assimilate the graduates with team-spirit, leadership and problem-solving skills so they can lead organizations they join or initiate their own ventures.

PEO-3: To prepare and assist the graduates to be successful in higher education leading to Masters and Research programmes, thereby creating and disseminating knowledge through research activities in the theory and application of computing.

PEO-4: To groom the graduates as professional engineers with an understanding of professional and ethical responsibilities, enabling them to contribute effectively to the growth and development of a body of knowledge.

PEO-5: To instill the ability to analyze the requirements, understand the technical specifications and design the innovative solutions by applying the principles of computing.

ABOUT THE DEPARTMENT

The Department of Computer Science & Engineering was established in 1997. The B. Tech Computer Science & Engineering programme offered by the Department had been accredited twice by the National Board of Accreditation (NBA) in 2003 and in 2007. The Department focuses on mastering the fundamental concepts both theoretically and practically. It motivates for learning, intellectual efficacy and self-reliance, which provides the best foundation for continuing professional achievement. Master of Technology in Computer Engineering programme provides intensive training to the students at advanced level to enable them to take up research and development activities. The course curriculum has been specially tailored to fulfill the growing global outlook and focus on upcoming technologies in the field of Computer Science and Engineering to cater to the needs of the industry and R&D organizations. The Faculty members of the Department are actively involved in research and development activities and continuously participating and contributing in National and International Conferences and Seminars. The faculty members of the Department are well published, experienced, conferred with M. Tech/Ph. D degree.

The Department is having several student chapters of the professional bodies like IEEE, CSI, ACM & ISTE. Students are participating in various activities regularly to enhance their technical and interpersonal skills under the banner of these professional societies. The Department also interacts regularly with Information Technology organizations like TCS, IBM, Sun Micro Systems, L&T, Infosys, HCL, Tech Mahindra, Dell-EMC, R Systems International etc. for providing latest technology updates to the students.

MRIU has collaborated with IBM to jointly offer B.Tech-Computer Science & Engineering programmes with specialization in Cloud Computing, Business Analytics & Optimization, Cyber Security & Forensics and Graphics & Gaming. The subject matter experts from IBM technology teach the faculty members about the cutting edge technologies through 'Train the Trainer' programmes. IBM provides Learning Management System, Industry Projects for students, Expert Lectures, Industry connectivity for students & teachers to enable them to experience the live IT Environment. This partnership help students to acquire domain skills in the most advanced areas of IT and preferential placements by IT companies. Students enrolled in these programmes have access to an online Eco-system Platform namely Innovation Center for Open Standards enabling them to access course material, discussion forums, student projects, industry mentors and news-clips.

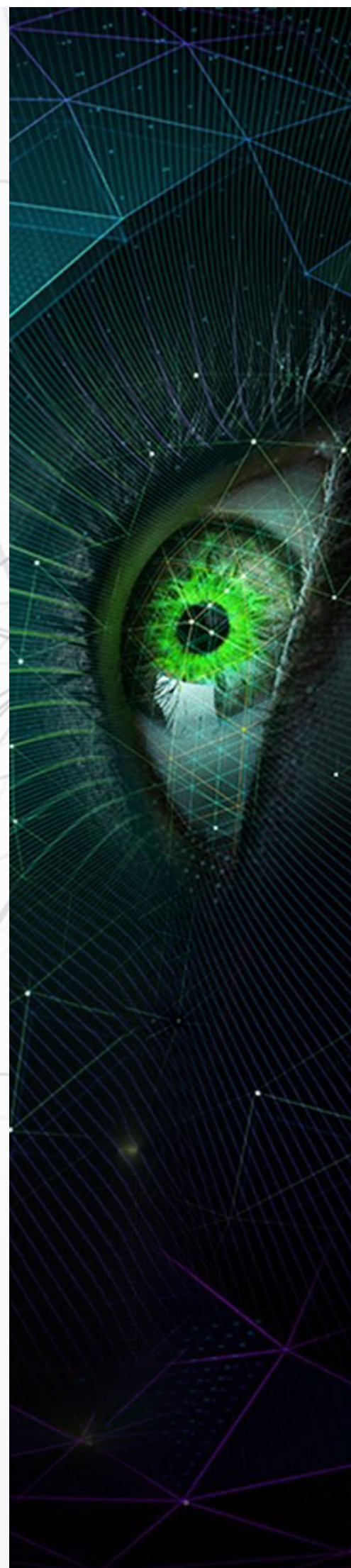
Students enrolled in these programs undertake live projects developed by IBM/other IT majors under the mentorship of industry experts and go for industry visits in software development and testing centers. They also attend one-week extensive training programme at Bangalore in IBM facilities at their cost in which hands-on training is provided by IBM and other IT company experts. IBM shall also issue certificates for various modules after successful completion in addition to the MRIIRS Degree. The Programmes in association with IBM lead to big increase in job opportunities and industry readiness for the students.

Approximately 25% of the credits shall relate to the specific specialization in a particular programme and replace certain courses covered under normal B. Tech CSE Programmes.

The Department has also collaborated with other leading industries in order to give exposure to the students. TCG Digital solutions private Limited will set up virtual Cyber Security platform lab for training the students in the area of cyber security. The Department also has collaborations with Infosys, Dell-EMC & R-Systems International Ltd. These collaborations help the students to work on the technologies which are currently being used in industry.

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Analysis of Android Operating System Security Risks

Android, the world's most mainstream portable stage, powers a huge number of cellphones in more than 190 nations around the globe. It's the biggest introduced base of any portable stage which helps in developing multiple clients equipped with Android gadgets. Android is one of the quickest developing Smartphone working framework in the business which was conceived on November 5, 2007. The objective of this paper was to give an overview of various Android attacks and intrusion detection systems.

Our Mobile devices are more than just communication devices as they know more about us than anyone else. These devices used to store the information for what we browse, like, do, watch, listen, search, where we go, Personally Identifiable Information, Mobile banking, e-commerce, social networking passwords etc. Further for corporation's mobile devices can be seen as branding and law. For Marketers and Advertisers mobile devices and their apps have information that is worth a gold mine which has got much attention in the recent past from Media as well.

Different vulnerabilities associated with the android operating system. Upon installing of Android application it requests for the permission to use the critical resources considering that user is aware of the risks associated with this permission, but this is not the fact. Since the Trojan Horse or malware steals the personal and financial data of the user, it becomes necessary to understand the working of malignant applications if any permission is granted by benign application. Thus the common problem with the available intrusion detection systems is to understand how malevolent applications access mobiles resources and maliciously utilize the data. The benign applications may also turn to malicious applications due to several reasons such as:

- A mis-match of system calls events done by the intrusion detection system.
- The credibility of app and its creator.
- False alarm by the present intrusion detection system.

Rather than having to invest one's resources on intrusion detection systems we suggested the use of an authorized integrated development environment (IDE) which contains pre-written directories to ensure integrity and authenticity of the applications.

Kashish Handa

STUDENT B Tech- 3rd Year

Natural Language Processing: Challenges and Application

Language is such a powerful method for representing your thoughts and to understand what others want to convey. Language encourages speakers to be as obscure or as exact as they prefer. NLP stands for regular dialect preparing. Regular dialects are those dialects that are talked by the people in their everyday life. Natural language processing assists in everything a PC needs to comprehend a characteristic dialect and furthermore to create normal language. Natural Language Processing (NLP) is a field of software engineering, counterfeit consciousness, and semantics, for the most part, concentrates on the connections amongst PCs and human dialects or common dialects. NLP is focused on the range of human PC collaboration. The requirement for regular dialect handling was likewise felt on the grounds that there is a wide stockpiling of data recorded or put away in a characteristic language that could be open by means of PCs. Data is always created as books, news, business and government reports, and logical papers, a large number of which are accessible on the web or even in a few reports. A framework requiring a lot of data must have the capacity to process characteristic dialect to recover a great part of the data accessible on PCs. NLP is the field in which we need to assess the various hypotheses that are to understand the regular dialects. The robustness or the ability to use natural dialect for query specification and retrieval wins over the keyword, key phrase approaches. They believe that the confined use of natural dialect in captions for multimedia data generalization is a less clumsy task than full natural dialect fact generalization, and feel that we have a system that can be judged and built upon not only for generalizing images but also the form so multimedia (audio, video, text, data etc) data or input sources as well.



Harshit Kapoor
Student, B.Tech – 3rd Year

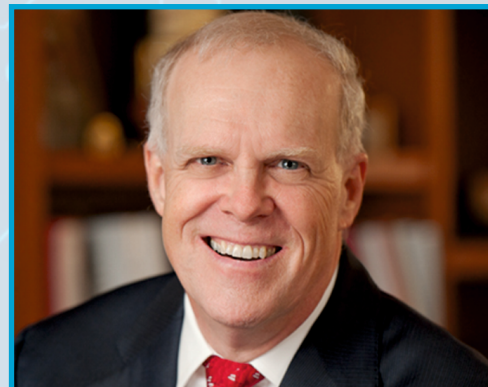
Akshat Sharma
Student, B.Tech – 3rd Year

Janmejay Mohanty
Student, B.Tech- 3rd Year

Amit Chugh
Assistant Professor-CSE

Turing Award Winners 2017

John Hennessy and David Patterson created a systematic and quantitative approach to designing faster, lower power, and reduced complexity microprocessors. Their approach led to lasting and repeatable principles that generations of architects have used for many projects in academia and industry. The impact has been stunning: many tens of billions of processors use reduced complexity architectures. In particular, the ARM processor, which powers nearly all smart phones, was significantly influenced by Hennessy and Patterson's work.



JOHN L HENNESSY
United States – 2017



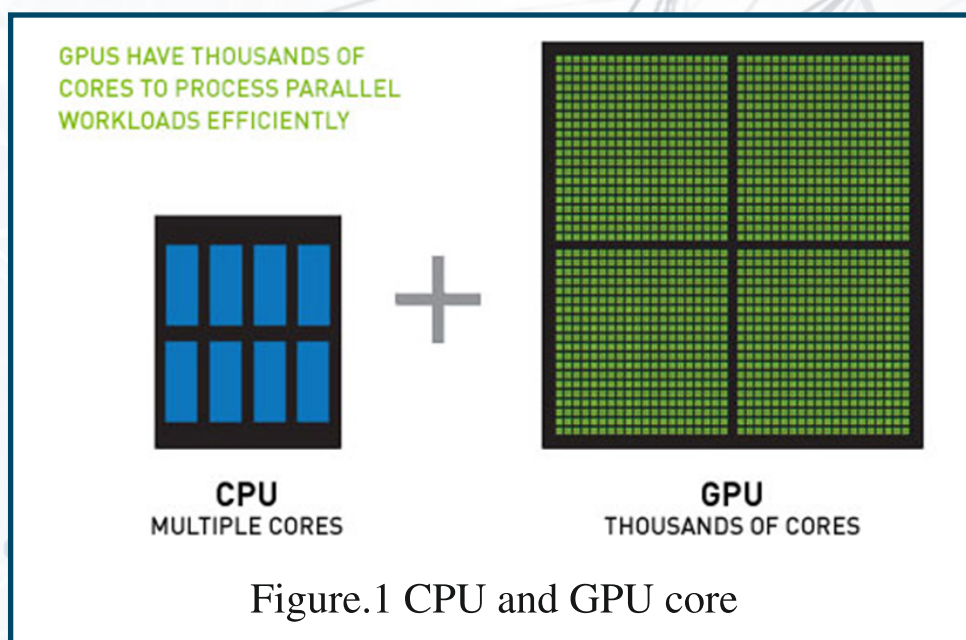
DAVID PATTERSON
United States – 2017

David Patterson and John Hennessy created a systematic and quantitative approach to designing faster, lower power, and reduced complexity microprocessors. Their approach led to lasting and repeatable principles that generations of architects have used for many projects in academia and industry. The impact has been stunning: many tens of billions of processors use reduced complexity architectures. In particular, the ARM processor, which powers nearly all smart phones, was significantly influenced by Patterson and Hennessy's work.

CPU vs GPU

CPU is the main processing unit and have graphics card integrated on them. This is due to the reason that GPU works with CPU, it's almost like the compliment for CPU. CPU accomplishes the entire task, which has to be done with computer. While GPUs are best to handle graphics related task such as image processing. This is just because GPU handles all the tiny calculations that need to be conducted when working with graphics. During the calculations of these tiny equations, these are transferred to the GPU rather than sending to the CPU, as CPU works only with few of the equation in serial manner and GPU works in total while executing all the tiny equations in parallel manner. GPU perform operations on the arrays of data, that means it organize the data in streams which requires same type of operations and processed all together. There performance will always increase while doing same type of operations for large amount of data.

One of the best ways to differentiate between CPU and GPU will be talking about the specification of each of them. Let's take a review of specifications each of them poses. Intel core i7 processor has two physical cores with four threads per core and has base clock speed of 2.70 GHz and that of NVIDIA GTX1080. GPU has a base clock speed of 1.60GHz. GPU has extensive 2560 cores. Figure.1 represents the different cores present in CPU and GPU.



Based on this specification it is clear that CPUs are good at executing single calculations very quickly and have a faster clock speed. While GPUs have more cores and they are better at handling multiple calculations when we do not have a time limit for execution.

Another specification is RAMMING, processors generally don't have their own RAM, while GPUs have their own RAM and it's called Virtual RAM (VRAM). Virtual RAM is generally faster than system RAM, as it's implemented on the same chip, but its size is smaller. If the size of VRAM on a GPU is not big enough, it will load resources onto system RAM. Most of the GPUS includes 4GB or sometimes 8GB of VRAM.

Figure.2 shows the architecture of CPU and GPU.

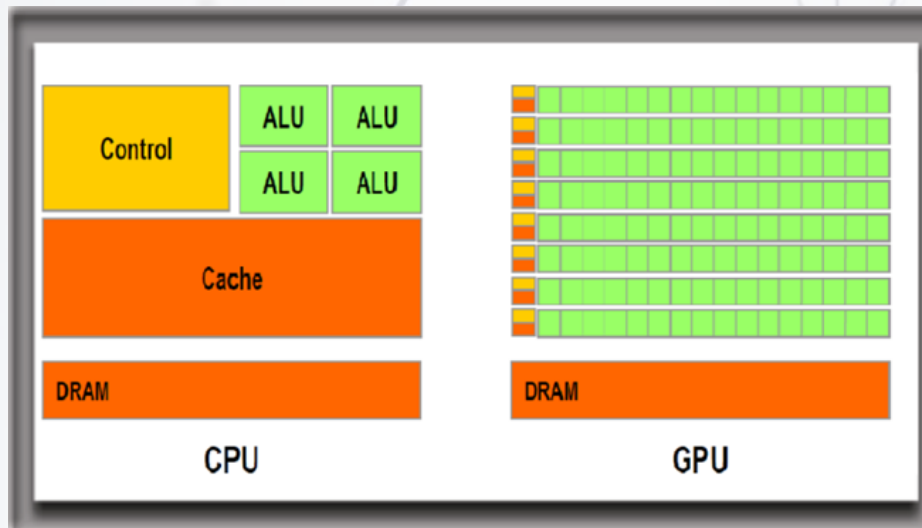


Figure.2 CPU vs. GPU

Other differences include the cache memory used in the CPU and GPU. CPU includes lots of cache memory that will allow the CPU to handle few threads at a time. On the other hand GPUs have much smaller amount of cache memory. GPUs have almost 200 times more processors per chip than a CPU.

While other features for comparing the CPU and GPU include Computing Density, different types of operation, pipelining stages and Latency tolerance. CPU has low compute density power while GPU has high compute density power. As already discussed CPUs are best for serial operations and GPUs are best for parallel operations. As the architecture of GPU include more parallel execution Units called the Arithmetic Logical Unit (ALU). CPUs has less than 30 stages in pipelines that's why it is called as Shallow pipelines and GPUs consists of hundreds of stages called as deep pipelines. Run time must be accounted when calculating the results with GPU. It also includes the memory transfer time between CPU and GPU and the kernel launch overheads. A GPU core is optimized exclusively for data computations. Because of this singular focus, a GPU core is simpler and has a smaller die area than a CPU, allowing many more GPU cores to be crammed onto a single chip. A non-graphics programming language for GPU called Computer Unified Device Architecture (CUDA) was introduced by NVIDIA. From 2004 onwards GPU are capable of doing programming and results in growing number of applications that uses parallel computing. The advantage of parallel computing over serial processing is its low cost. But its disadvantage includes less support of these libraries for double precision.

Neetu Singh

Research Scholar -PhD

Analysis and Comparison of Different Detection Techniques of IDPS



In today's world many enterprises are moving towards the cloud computing systems as it will provide an attractive and cheap service for users to store their data and run applications along with the accessibility and reliability options. This abstraction is slowly becoming a reality as we are moving towards using smaller and affordable PC's and servers which together construct the so called Cloud Computing System, also called Cloud. It's a technology in which data storage, computation and management takes place on multiple servers which can be accessed through internet at any time any place. Storing of data on multiple servers focuses on one important question that is its security. Hence, Cloud computing appears inadvisable for many business critical computations due to issues such as service availability, data confidentiality and others. Different parts of an application can be stored at different locations therefore it's natural that monitoring and maintenance is not a simple task. Customers have a fear of losing data since the tools for monitoring are not always provided to them and there is no control of customer over the infrastructure in which data is stored.

Intrusion detection and prevention system here plays a vital role by protecting the infrastructure where data is stored. Using IDPS, attacks can be identified and notified to the administrator immediately or can be prevented from causing more harm to the system.

A Traditional IDPS monitored data, perform analysis, detect malicious activities and then generate alarms and preventive response was given but it generated alarm for every attack irrespective of the severity of threat. Some attacks called as incidents looked malicious but they were not. These false alarms impacted the systems which sometimes caused unavailability of the data. To overcome this problem, various advanced IDPS were developed.

Different techniques of intrusion detection system are signature, anomaly and hybrid. Signature detection method looks for the known attacks in the cloud whereas Anomaly detects unknown attacks and hybrid detection method has the capability of both signature and anomaly methods. So, it can detect both known and unknown attacks in cloud. For prevention of detected attacks IPS is installed at various locations in a network or in host systems. Earlier only firewalls were used to protect a network. Firewalls examine the incoming packets and outgoing packets. Now, content-based IPS is considered as it has an advantage of detecting signature and anomaly attacks and also preventing them.

Navjot Kamboj

STUDENT B Tech- 3rd Year

On The Security of Open Source Software



Nowadays, the usage of Open source software (OSS) is becoming more popular along with its flaws and benefits. By using OSS constantly, it provides several aspects of the internet's infrastructure. There are several commerce-based research questions which may improve the quality of the OSS related to the future of the internet. This software matches with the advantages of OSS in comparison with the key attributes in tomorrow's network that will need mainly in terms of security. OSS presents few arguments which are beneficial for the open source security. This represents qualitative evidence by which the security issues are getting concerned. It surrounds the development and requirement of OSS. The OSS is particularly related to the software that is proprietary. It allows several rights to the user for further redistribution and modification of the source code. In this paper, we have highlighted various benefits of the usage of open source software. We have also mentioned some security concerning issues that allows an easy prey for an attacker to modify and perform some malicious activities by using the software and the risks associated with it.

We observe that individuals and businesses are strongly dependent on software system and networks. Now with the rising dependency on the open source software, there is a great way of maintaining control over any infrastructure. Generally, any computer security software is designed to enhance the information security of the system. Instead of this security, businesses are getting struck that are not able to rely on the information systems which make them dependent for their survivals. The customers are lacking their belief regarding the security of transactions that was one of the major factors in the place of growth of the internet. The source code which we have manually developed can be secured easily, but the source code collecting from the internet cannot be secured. Though the internet collected programs are freely available, that can build the infrastructure of secured software. OSS is free software which contains programs where the source code is easily available.

This software is based on the concept of allowing certain regulations, before providing freedoms to the user. This software will allow the right to every user for accessing the source code in editing mode and promoting redistribution of the software. Then sell the software either as a part of another product or on its own. Generally, OSS does not allow the rights of modification for which the software may be used. OSS has shown its users to be very much secured as compared to the proprietary software from large vendors. While downloading the software, we have to take some precautions to prevent it from copying. We can easily do it by checking the digital signature for some distributors to add on their sites. OSS provides many tools that are required for running a system. A lot of success in

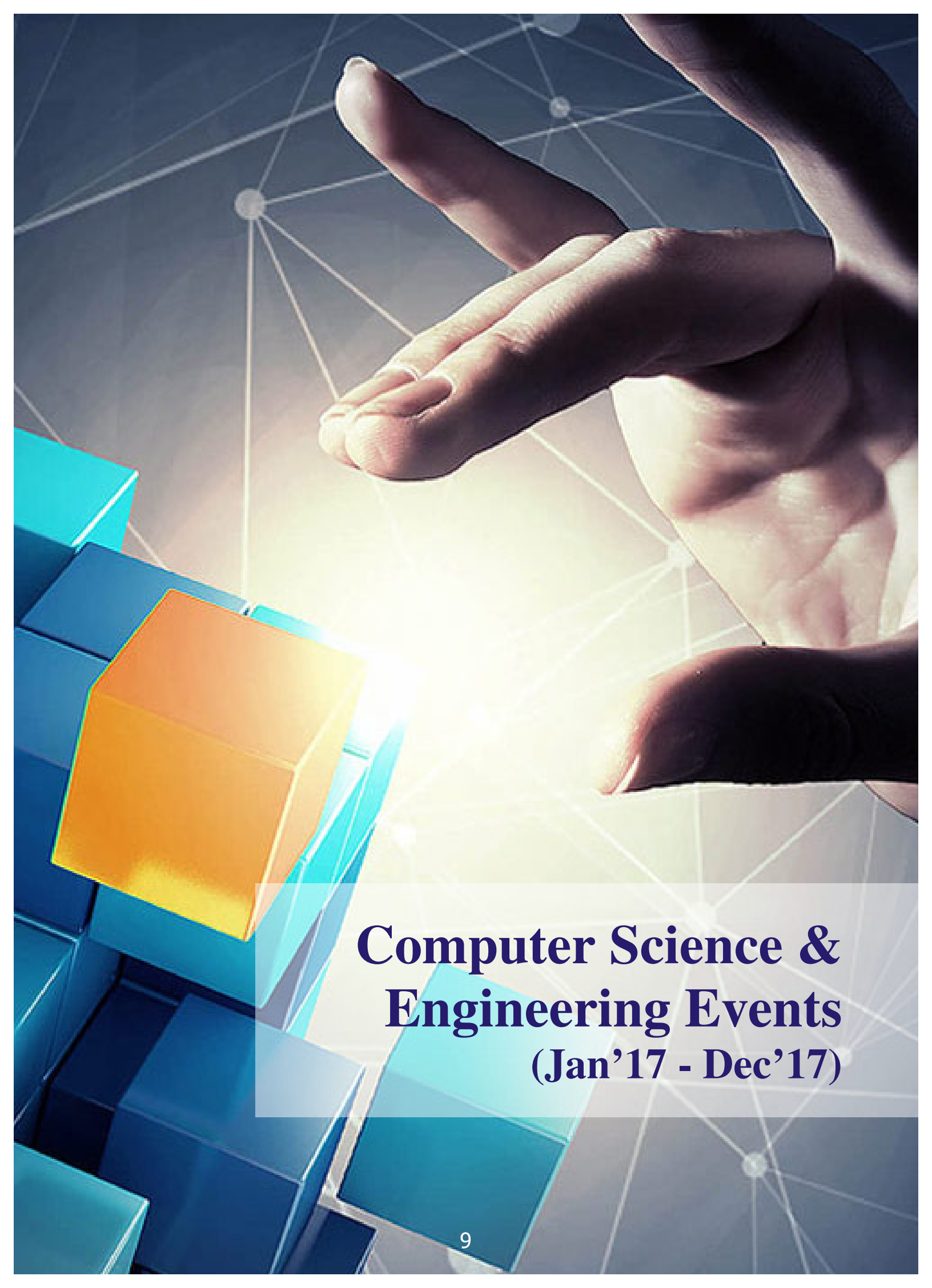


terms of money is achieved by utilizing computers that cannot be gained by selling the software. This achievement comes by utilizing software in order to sell or produce goods and services. Now OSS has proved to be much secure as compared to the commercial software. We should be keen in order to verify the signature and the source code for the open source before we download it.

So, we can say that Open Source Software is much better than closed software in terms of vulnerability concerning security. No OSS have caliber for becoming more secure as compared to the closed source. But the open source may face some security issues. Another problem is that, though the source codes are freely available through the open source software, we do not have any right to modify or redistribute the source code. Open source is not considered as a 'free source' instead of being the source code as 'free'. In OSS, there are some different licenses that actually means as a free software but although they have different terms. The two common licenses come under the Berkley Software Distribution (BSD) and General Public License (GPL). There is no any universal standard that is determining any particular license which is referred as open software. The Debian Free Software Guidelines (DFSG) and Open Source Definition (OSD) represent the sets of criteria that are commonly accepted. The contrast of open source software is very simple. This is mean by licensing traditionally the software that is referred to as 'binary' or 'proprietary-only', it is usually lacking the source code. But a closed source is opposite in meaning as compared to open source. Trojan Horses and other malicious code can severely affect and can cause damage to our systems. Trojan Horses may be included into proprietary software. Trojan horses can breach the system and have the capability to corrupt all the files present in a computer system. An Adware is a software that contains advertisements inserted in the application. Adware is another way for offering the consumers who don't want to give money to the software. There are few ad-supported programs, utilities or games are distributed for adware (or freeware). They are used for creating unnecessary advertisements.

Prattay Sanyal

STUDENT B Tech- 3rd Year

A hand is shown reaching towards a glowing orange cube in a digital space. The background features a network of white lines and nodes on a dark blue background. The scene is illuminated by a bright light source, creating a lens flare effect. The overall aesthetic is futuristic and technological.

Computer Science & Engineering Events (Jan'17 - Dec'17)

IBM ICE (INNOVATION CENTRE FOR EDUCATION) DAY

In a world, where there is growing demand for skilled IT professionals, the key to transforming today's students into tomorrow's working professionals is to develop industry capabilities right from foundation level. To this effect, under the IBM-MRIU academic initiative, Department of Computer Science and Engineering (CSE), Faculty of Engineering and Technology, Manav Rachna International University, became host to an academic event called 'IBM ICE (Innovation Centre for Education) Day', in association with IBM, on January 17, 2017, at its MRIU Campus, Faridabad. The objective of this event was to give the software engineers of tomorrow an edge over their peers, in the understanding and usage of industry-leading IBM enterprise class software and have one to one interaction with IBM employers and professionals.

The event commenced in the presence of Dr. M. K. Soni, Executive Director and Dean, FET, Dr. S. S. Tyagi, Prof. Anil Chopra, esteemed guests from IBM, Mr. Hari Ramasubramanian, IBM Business Development Lead at IBM India/ South Asia, Mr. Vithal Madyalkar, Country Manager, IBM Innovation Centre, Bangalore, Mr. Manoj Sardana, Consultant, Dr. Neha Sehgal, Academic Trainer, Mr. Sourav Agarwal, Skillcube, Mr. Viqarrudin Surki, Lead Learning Developer, Mr. Vikas Saraswat, Telecom Audit Consultant, faculty members and students. Dr. M. K. Soni addressed the delegates and students with a welcome speech and spoke about the significance of collaborating with IBM. Mr. Hari Ramasubramanian then spoke to the students and discussed how IBM ICE will help in enhancing the employability of graduates and how they will have an advantage over the non-ICE graduates. Mr. Vithal Madyalkar necessitated the students to leverage the IBM ICE program for better career opportunities. Mr. Manoj Sardana gave an expert lecture on 'Bluemix Technology of Cloud'. He also listed various other areas in Cloud Computing, specifically for 6th semester students, motivating them to take up innovative projects in these areas. The students were then divided into two groups, based on their specializations. In one of the sessions Dr. Neha Sehgal spoke on 'Data Analytics', discussing its applications involving real world examples. In other parallel session, Mr. Sourav Agarwal discussed the issues of Cyber security in live applications and the profiles required for job opportunities in the said area. After a short break the event resumed where Quizzes/ puzzles were conducted for the participating students. Mr. Sourav Agarwal, Mr. Viqarrudin Surki, Mr. Vikas Saraswat distributed prizes to the winners. It was a successful and enjoyable event, which the Department plans to continue in the future, in conjunction with IBM India.

A STUDENT-ALUMNI INTERACTION

Witnessing a former student we have taught, reach new heights and become successful, is a great reward. While current students get immeasurable value from their interactions with the alumni, the benefits of establishing Student-Alumni interaction programs are immense. Students have the opportunity to talk and sometimes, visit with professionals, who were once students themselves. They have the chance to ask questions and learn about the general work culture or a specific company. In a world, where there is growing demand for skilled IT professionals, the key to transforming today's students into tomorrow's working professionals is to develop industry capabilities right from the foundation level. To this effect, Department of Computer Science and Engineering (CSE), Faculty of Engineering and Technology, Manav Rachna International University, organized a Student-Alumni Interaction, on January 31, 2017, at its MRIU Campus, Faridabad.

One of our alumni Mr. Pankaj Singh is successfully running his Company “Simplified Product Solutions” in Auckland, New Zealand. He shared the memories of his golden college days with the students. He said “The domain knowledge and industry exposure provided to me through various efforts, ensures that I am on top of my game. Also the faith and trust, my teachers showed in me, have made me who I am today”. He motivated the students to work harder, participate in technical competitions and not waste any opportunity to learn something new.



FDP on Experiential, Project-based Learn-by-doing Learning Approach Using Java Programming (Online)

A 10 days showcase program was organized from 13th February, 2017 to 24th February, 2017, held at its MRIU campus, Faridabad. The resource person for the program was Prof (Dr) Lynn Carter, from Robert Carter Academy, USA. He is a former Professor of Carnegie Mellon University, Pittsburgh, Pennsylvania, USA.

This showcase program was designed to make the participants familiar with the methodology to develop software with a test driven approach. This program provided an “on the job” experience to students by going through the phased development of a software in which all the participants were provided with some activity, in which they were asked to enhance the code keeping in mind all the constrained provided by the trainer. All this comes under Test-driven Development (TDD).

The activities were to develop a calculator having square root with high-quality output. To build such a calculator some other activities were covered that include, Dynamic Select Lists - using Finite State Machines, Implementing a Finite State Machine, Finite State Machines and Specifications, working of FSM, Implementing the new select list using the FSM, UML, Floating Point Recognizer.

A special session was arranged on how to give and receive feedback for a work that we are supposed to get/deliver so as improve it in near future, the resource person for this session was Prof. Martin, from Robert Carter Academy, USA.

After that some more activities were added to enhance the calculator. All the interns demonstrated a new and improved calculator which was implemented in java and successfully completed the showcase.



ACADVIEW ORIENTATION

Student-Industry Interaction was organized on February 20, 2017, at its MRIU Campus, Faridabad. The event was an Orientation programme regarding summer training course being offered by AcadView.

The session began in the presence of Dr. Suresh Kumar, Prof. Anil Chopra, our esteemed guest Mr. Himanshu Batra, Founder & CEO, Acadview, Faculty members and students studying in sixth semester. Mr. Himanshu Batra, AcadView Founder, made an impactful and detailed orientation, an ice breaking session to present his summer training platform to the students in the domain of front-end development using JavaScript, HTML, CSS, JQuery, Angular JS, Bootstrap and Django Framework.

Some of the salient features as stated, in the session are:

A 10-12 week training session.

Professional project-based training

Individual training projects and mentoring

Detailed and practical knowledge of the technology imparted to students

Computer generated 'Authentic' resume on the basis of the projects accomplished in the period.

A short question and answer session was incorporated to help students achieve better understanding. Orientation Session ended with a vote of thanks by prof. Anil chopra.



WEBINAR ON 'CYBER SECURITY AND DIGITAL FORENSICS'

Students of Department of Computer Science and Engineering (CSE), Faculty of Engineering and Technology, Manav Rachna International University, attended a webinar On 'Cyber Security and Digital Forensics', by IBM on February 21, 2017, at its MRIU Campus, Faridabad. The attendees gathered in a lecture theatre, where the lecture was streamed live.

The webinar informed the audience all about the data security, its needs and benefits, what data should be protected and what are threats against it. The session started with the speaker introducing the concept of data security and data protection. Data protection not only mean protecting the data but it implies that if by any chance data get accessed by any unauthorized entity it remains protected by the means of encryption techniques. Thereafter the need and importance of data security was explained: some data if not protected can have catastrophic effects on business productivity and the organization infrastructure, data security is also important to ensure reputational advantages and the ongoing productivity. The foremost thing an organization can do is to classify the data that has to be protected: what is important to them, what data can be considered critical and sensitive, losing which can lead to a loss of some kind. This leads to the next section that talk about the critical data for an organization which may be the customer, product, employee and company information or the cost, the price of disruption etc. Then comes the process of data security that includes the design, the implementation and the monitoring of all the assets and data that an organization holds. In the later stage of the session, all the threats associated with the data, that can potentially cause any harm to the data were discussed which included the malware threats: different types of viruses, Trojan horses, network based threats: botnet, phishing, cryptographic attacks: weak key attack, birthday attack, database threats, banking frauds and more. All the benefits of data security that involves ensuring the CIA trade, cost effectiveness, no misuse of data were explained at last. The webinar concluded with questions that students had, which were all answered expertly by the speaker. All in all it was a very interactive and knowledgeable experience for the students who learned all about data security holistically.



Workshop on Cloud Computing and Security in Social Networks under ACM Student Chapter

A workshop was organized on Cloud Computing and Security in Social Networks under the Association for Computing Machinery (ACM) student chapter on February 22, 2017 at the A-Block seminar Hall, MRIU Campus.

The speaker of the session was Prof. Ponnurangam Kumaraguru ("PK") who is an Associate Professor, at the Indraprastha Institute of Information Technology (IIIT), Delhi, India, since August 2009. He is a TEDx and an ACM Distinguished speaker. He plays an advisory role in various government organizations and a Fortune 500 company. He is the Founding Head of Cyber security Education and Research Centre (CERC) at IIIT-Delhi. He received his Ph.D. from the School of Computer Science at Carnegie Mellon University (CMU). He is primarily excited about and works on issues related to Privacy and Security in Online Social Media, Computational Social Science, and Data Science for Social Good. In the past 8 years of his faculty life, he has managed projects close to 800,000 USDs (approx. 5 crores of Indian rupees).

Prof PK spoke about Privacy and Security in Online Social Media where he stated other facts like “the rising number of deaths related to selfies and discussed few ideas to prevent these”, following to this he talked about his research regarding browser extensions which are stealing your data. His research calculated about 218 extensions that will steal your data if you install them. He made the students aware about the publicly available government data that can be tracked, questioning our privacy. He also gave a view of a web application called OCEAN (Open-source Collation of eGovernment data And Networks) as it collects publicly available data via PAN card , Driver’s license , Voter Id and displayed all at a single platform.

Another speaker was Mr. Amit Sharma – Technical Seminar Expert at APTRON Services, where he discussed about cloud computing and its advantages over tradition IT systems. He also stated some facts and figures on how using AWS (Amazon Web Services) is cheaper.



Webinar on Introduction to Virtualization and Cloud-Computing

A webinar for B. Tech (IBM-CC) 4th semester students was held on 23rd February, 2017, on the topic 'Introduction to Virtualization and Cloud-Computing'. The lecture was delivered by Mr. Vigaruddin Surki, Lead Learning Developer, IBM. The main objective of the webinar was to give an understanding to Virtualization, need for virtualization and the impact of virtualization. Virtualization refers to the technique of building an abstraction layer over the hardware that closely resembles the underlying system, thereby, cloning the functionality of the original components into the software. The question here is why one would want to clone the system; reasons are the benefits offered by the abstraction layer. Virtualization eliminates most of the inflexibilities inherent in the hardware system and allows for better manageability leading to a better utilization of the system. After a brief introduction, the major points discussed, are as follows:

Virtualization can be classified as:

1. Full emulation: The virtual machine emulates complete set of hardware and peripheral components, this allows for an emulation of a completely different type of hardware distinct from the real hardware.
2. Full/Native Virtualization: In this method, only a section of hardware is emulated and uses the real hardware for the rest.
3. Para-Virtualization: There is no hardware simulation/emulation done by the Virtual Machine. The Virtual Machine uses hypercall API to communicate with the hypervisor for instruction dispatch and other purposes.
4. OS Virtualization: This is a technique in which a single OS instance allows multiple sub-instances of OS to run in a secure environment.
5. Application Virtualization: Applications allows virtualization by creating a separate sub-application instance with components that are not shared within the application.

Following are Virtualization Approaches:

1. Hosted Architecture: In hosted architecture, an operating system is installed on the hardware first; next, a hypervisor or virtual machine monitor is installed. This software is used to install multiple guest operation systems, or virtual machines (Vms), on the hardware.
2. Hypervisor Architecture: In hypervisor architecture, the hypervisor has direct access to hardware resources, which results in better performance, scalability and stability, however, hardware support is typically more limited, because the hypervisor usually has limited device drivers built into it.

Virtualization has the following benefits:

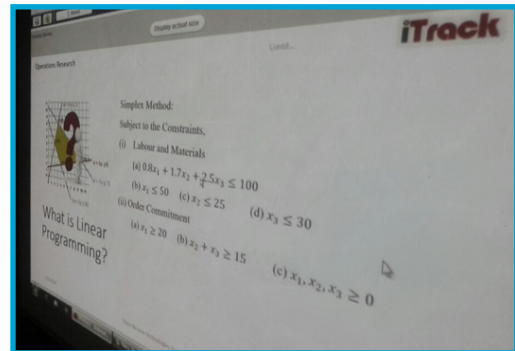
1. Utilization: Virtualization builds an abstraction of hardware system resources in software. Each OS/Application run in its own isolated environment allowing sharing of resources and brings up the utilization of the physical system.
2. Security: Since each application runs in its own virtual machine, there is a strict isolation of system resources, and sharing only happens in a controlled manner.
3. Manageability: it is possible to move the abstraction system components around in the infrastructure based on load distribution and save a snapshot of virtual machine to be stored later. This saves a lot of time spent in system administration.



WEBINAR ON 'OPERATIONS RESEARCH'

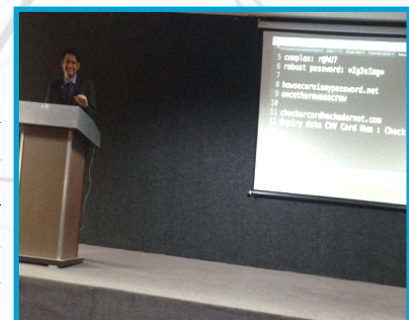
Students of Department of Computer Science and Engineering (CSE), Faculty of Engineering and Technology, Manav Rachna International University, attended a Webinar on Operations Research, on February 23, 2017, at its MRIU Campus, Faridabad. The webinar was organized for the students of pre-final year, studying B. Tech IBM specialization courses. The attendees gathered in a lecture theatre, where the lecture was streamed live.

The session was organized in A- Block lecture theatre. The lecture elaborated majorly upon the advantages of OR model, for instance ease of describing the relationship, how a problem can be viewed in its entirety and how it helps in transmitting ideas among other peers in an organization etc.; Features of OR solution such as reliability, economically viable and technically appropriate etc.; Applications of OR in the areas of Finance and Accounting, Investment and Auditing, Marketing and Media planning, Procurement and exploration, Product management, Manufacturing etc. The lecture also introduced the concept of Linear Programming and its basic components namely Decision variable, Objective function, Constraints and Non-negativity; assumptions of Linear programming such as certainty, additivity, linearity and divisibility.



SEMINAR ON CYBER SECURITY

A seminar is organized on 'Cyber Security and Ethical Hacking', on March 18, 2017, held at its MRIU campus, Faridabad. It was conducted by Mr. Rahul Tyagi, Vice President - Training, Lucideus Tech Pvt. Ltd., a renowned personality in the field of ethical hacking. He provided a great opportunity to the students of computer science department to understand the basics of web security and the ethical ways of hacking. The seminar started with a brief introduction to security terms in an interactive manner. He also showed the students how phone tracing is not a difficult task anymore and how various fraudulent websites steal personal information from users. He introduced students to the art of password keeping and easy downloading of books, research papers, literary material etc. His method of interaction was appreciated by one and all. Then he also enlightened the students about a firm called Lucideus which is amongst the top security companies in the world providing services to various banks, IT companies etc and told students about the benefits of summer training program conducted by the companies. The seminar was a great opportunity and learning time for the students as well as faculties present. Everyone had positive reviews about the seminar and were keen to participate in the summer training program.



PROJECT CARNIVAL

The Project Carnival was conducted by the Department of Computer Science and Engineering, Faculty of Engineering and Technology, on the theme titled Internet of Things (“IoT”) on 28th March 2017.

A total of 11 project teams participated (28 students) of B. Tech 8th semester. Some of the projects exhibited were:

- Dentist Posture Belt,
- Android ticketing of railways with GPS validation using QR code,
- Smart Grievances Redressal system,
- Smart City Solutions etc.

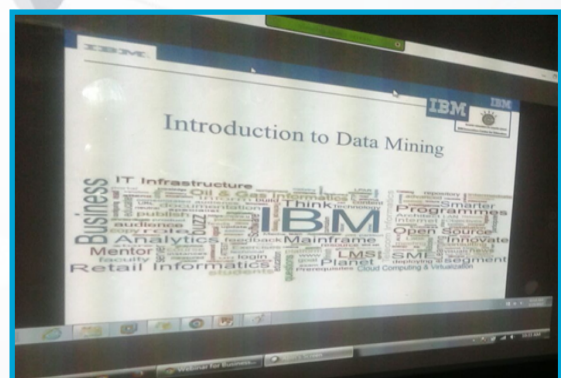


Dr. Suresh Kumar, HOD-CSE and two Industry Experts addressed these students followed by detailed evaluation of each project team by the experts. Many good suggestions were given by the experts for the improvement of the projects. Hence it was a learning experience for students.

The Management team of MRIU visited the Department of CSE, comprising of our Honorable Vice Chancellor Dr N. C. Wadhwa; Dr. M. K. Soni, Executive Director and Dean, MRIU; Dr. Naresh Grover, Dean, Academics; Dr. R. V. Singh, Professor, Department of Mechanical Engg., Dr. S. S. Tyagi, Professor, Department of CSE, and showed keen interest by interacting with the participants. The team of ‘Dentist Posture Belt’ won the title of Best Project.

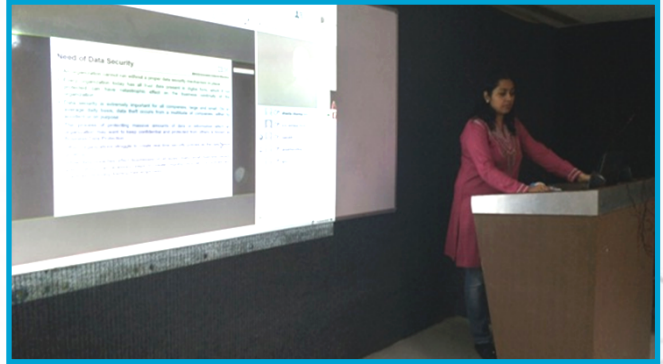
WEBINAR ON DATA MINING

A webinar for B. Tech (IBM-CC) 6th semester students was held on 6th April, 2017, on the topic ‘Data Mining’. The lecture was delivered by Mr. Abin K. Abraham, Trainer, IBM. He discussed about the basic concepts of Data Mining, Data warehouse, various types of Data warehouse, explained how we can transform heterogeneous data into homogenous data, discussed about Data Marts, different data mining patterns, representations of homogenous data, techniques for analysis of data mining, elaborated about KDD(knowledge discovery data) and CRISP (Cross Industry Standard Process for Data Mining), techniques such as classification, segmentation, and association, discussed business intelligence and how several successful companies have been investing large sums of money in business intelligence and data warehousing tools and technologies. He cited various real life examples, which made the concepts relatable and clear to students.



WEBINAR ON IT DATA SECURITY

A webinar for B. Tech (IBM-CC) 6th semester students was held on 7th April, 2017, on the topic 'IT Data Security'. Security and privacy are essential for the internet economy as a platform for innovation, economic growth and social development. The information technology and the Internet have become more and more ubiquitous in our daily lives, hence there is an essential need for a more thorough understanding of information security, privacy issues and concerns. The Internet provides a wealth of information and services, but also presents certain risks. The webinar explained the IT Data security threats in detail, need and importance of data security; types of threats such as Malware threats, Network based Threats, Cryptographic Threats, Database Security Threats, Banking Fraud Threats, Web-application Threats, Physical Security Threats etc.; Threat techniques for each; Countermeasures and evolution of Mitigation techniques.



INTRODUCTION SESSION ON UTKRAANTI

Department of Computer Science and Engineering, Faculty of Engineering and Technology, Manav Rachna International University, organized an 'Introduction Session on Utkraanti', on April 07, 2017, held at its MRIU campus, Faridabad. The session was delivered by Mr. Shubham Gupta, Assistant Manager, Wingfotech Pvt. Ltd. He has a work experience of 3 years at Robo sapiens and has various certifications from reputed companies like IBM, Microsoft etc.

He gave the introduction to various career choices to 4th and 6th semester students of B. Tech (CSE). He told about various programming languages, scope in industries and also briefed about Web development, Android, java-based projects. He gave relevant information on summer internships and training, which is provided by his company.

At last, he offered training programs to the students in the session, which his company is providing in collaboration with the venture of IIT Delhi EDE cell. Around 5000 students all over India will be attending training at 16 Wingfotech centres, located all over the India.



Short term course on “Artificial Neural Network and Fuzzy Logic through ICT”

The current scenario of research in Computer Science is having wide focus on the Neural Network and Fuzzy Logic as these fields are in some or large extent related with Artificial Intelligence and Machine Learning. So keeping all this in mind, Department of Computer Science & Engineering, Faculty of Engineering and Technology and Faculty of Computer Applications, MRIU, organized a five days short term course on “Artificial Neural Network and Fuzzy Logic through ICT” during 24.04.2017 to 28.04.2017. The course was delivered by the faculties of National Institute of Technical Teachers Training and Research, Chandigarh.

There were 28 participants, wherein 25 Participants were from MREI and 3 participants from DAV Institute of Management, Faridabad. During this course, a wide variety of topics were discussed and some of the current research topics were explored.

On the first day Dr. Maitree Dutta, Head, Department of CSE, National Institute of Technical Teachers Training and Research, Chandigarh, inaugurated the event. Dr. S. S. Tyagi, Professor, CSE, on the behalf of Manav Rachna International University, addressed the participants of different remote centers and praised the initiative of NITTTR, Chandigarh, to choose this topic and provide such a platform for the participants. After the inauguration, a session on Overview of Neural Network was taken by Dr. Maitree Dutta, who explained all the terms and terminologies which are commonly used in neural networks to lay down the foundation of the course. She covered different types of neural networks such as feed-forward neural network, Radial basis function (RBF) network, Recurrent neural network, Modular neural networks, Physical neural network.

On the second day, Dr Maitree Dutta, delivered a talk on ‘Perceptron’, in which she explained about the Perceptron and how do we train a Perceptron. In her discussion, she talked about the different models of Perceptron such as Single layer Perceptron, Gradient descent learning , Multi-layer Perceptron, Back-propagation and a general model. She covered some practical issues such as rate of learning , pattern and batch, modes of training, initialization, scaling, stopping criteria, the number of training examples, the number of layers and neurons. Next she covered Back-propagation network in detail and discussed about the different aspects covered in back propagation networks.

On the third day, first session was taken by Dr. Renu Vig, Director, UIET, Chandigarh, in which she explained Associative memory and its applications and covered all current research trends and association of this with artificial neural network. Later, Dr. H K Sardana, Chief Scientist, CSIO, Chandigarh, discussed some research examples of neural network. Mrs. Shano Solanki discussed about the Fuzzy logic and its application in different areas.

On the Fourth day, first session was taken by Dr. Maitree Dutta on Adaptive Resonance theory in which she covered all the aspects of Adaptive Resonance theory and she took an example of one of the research scholar who is doing research under her and demonstrated some results and commands of MATLAB. She explained MATLAB Programming for neural network and some programming Examples.



After that one of her research scholar Ms. Jagrity Saini took a session on Optimization techniques in which she explained different methods of Artificial Neural Network optimization which include different local and global methods. She said that Back propagation is the most common method for optimization. Other methods like genetic algorithm were explained and an overview of gradient descent optimization algorithms was provided.

On the Fifth day, first session was continued by Ms. Jagrity Saini, in which she explained Hopfield, RBF network and MATLAB solutions of different problems were discussed. After that an On-line test was conducted to ascertain the knowledge gained through this course. And it was followed by a Valedictory session, which was addressed by Dr. Maitree Dutta, in which she took a feedback from each remote center, and some suggestions were provided to improve the quality of such Course.

National Conference on Networking, Cloud computing, Analytics and Computing Technology

Manav Rachna International University's mission is to support multidisciplinary research and development in the fields of science and engineering. Since its inception, MRIU has encouraged its faculty members and students to explore and implement innovative ideas. In reflection to this ideology, Department of Computer Science and Engineering (CSE), Faculty of Engineering and Technology, Manav Rachna International University, in association with Engineers India Ltd (EIL) and IBM, organized a two-day National Conference on 'Networking, Cloud computing, Analytics & Computing Technology', during May 26-27, 2017, at its Faridabad campus. The conference aimed to encourage development and promote scientific information exchange between faculty, researchers, engineers, students and practitioners working in India as well as abroad, in the field of "Networking, Cloud Computing, Analytics and Computing Technology".

The conference commenced in the presence of honorable Dr. N. C. Wadhwa, Patron, Vice Chancellor, MRIU; Prof. (Dr.) M. K. Soni, Conference Chair, Executive Director and Dean, FET, MRIU; Dr. Suresh Kumar, Conference Convener, Professor and Head, Department of CSE, FET, MRIU and Chief Guest Mr. Sandeep Malhotra, Chief Guest, VP, HCL Technologies. Dr. Suresh Kumar welcomed the participants and introduced the conference. He said that this conference aims to promote academic and research activities in the Department as well as University.

Dr. M. K. Soni bid welcome to our chief guest and participants. He introduced the emerging areas of computing technologies. He said that the IT world is ever changing and events like these help in coping up with the current trends, which also helps in better placements. He wished for the conference to be successful. Dr. N. C. Wadhwa wished for the conference to be a great learning experience for the participants. He said that MRIU is a dynamic educating campus which frequently organizes such events to update knowledge and interact with experts from various backgrounds. This knowledge when passed to younger minds would help greatly in the 'Skill Development' initiative of our Government. It would enhance knowledge based activities and research. We, as a country, also have a demographic advantage over the others. Hence, we can initiate and explore measures to create and disseminate knowledge in the emerging areas of Computing.

Mr. Sandeep Malhotra expressed his gratitude and immense pleasure for being a part of this conference. He explained the business dynamics of various companies such as Flipcart, PayTm, Shopclues, Ola Cabs, Google etc. along with the role, technology has



played in elevating these companies. He said that the shelf life of company has reduced from 75 years to 15 years. Today's market is data driven and works because of the user experience and convenience. He asked to focus on technology but not to leave the business and industry knowledge behind. He talked about data sets, software-defined networks, Artificial Intelligence to build applications, emergent jobs in cloud modernization, maintenance and support. The inauguration session concluded with the unveiling of the Conference souvenir and memento presentation.

The conference constituted of five Keynote speakers. On the first day, Mr. Vikas Bhardwaj, IBM spoke on the topic 'Blockchain Technology'; Mr. Ashish Arya, Senior Integration Engineer, SAP, delivered his talk on 'Blockchain, IOT and Machine Learning'; and Dr. T. V. Vijay Kumar, JNU, addressed the topic 'Big Data Revolutionary'. On the second day, Dr. Vikram Goel, IIIT Delhi, delivered his lecture on 'Graph mining using Map-Reduce' and Er. N. K. Garg, R Systems International Ltd, Noida, spoke on the topic 'Mobile Computing: Recent Trends and Future'. In a span of two days, a total of around 50 research papers were presented in the conference, in two parallel sessions, covering topics ranging from cloud computing, big data analytics in healthcare, data and web mining, to social networking, machine learning and Internet of Things.

The conference saw participants from various reputed organizations such as YMCA University of Science and Technology, Faridabad; Banasthali University, Rajasthan; Jawaharlal Nehru University, Delhi; Amity University, Gurugram; Shah Satnam Ji Institute of Technology & Management, Sirsa; Jaypee Institute of Information Technology University, Noida; JRE group of Institution; NSIT, Dwarka; Dr. Ambedkar College, Nagpur; JLN Govt. College, Faridabad, GSSS Khandawli, Faridabad etc. In the valedictory session, a vote of thanks was proposed by the Conference convener and participation certificates were distributed. Dr. Suresh Kumar expressed his gratitude to the participants for attending and making this event productive and fruitful. This conference focused on acquainting the participants with the current state-of-the-art and future perspectives in the said areas. The event proved to be extremely successful in bringing together academicians, practitioners, industry experts and research scholars on a common platform from within the country. The conference also provided ample opportunities to exchange trends and practical applications across the borders so that new vistas can be explored.



ONE DAY WORKSHOP ON 'AGILE METHODOLOGY'

A day workshop was organized on the topic 'AGILE METHODOLOGY', delivered by Ms. Srilekh Sridharan, working with TCS from more than 12 years, on 19th August, 2017, held at its MRIU campus, Faridabad.

Software Development is the core practice in any IT organization. Software development is the practice of organizing the design and construction of software, the beating heart of much technology fundamental to one's personal and professional life. Agile is one form of software development methodology. Its focus is on client satisfaction through continuous delivery. It is the best alternative to the traditional Software Development models that is more focused on limiting the project scope.

The workshop was conducted by Ms. Srilekh Sridharan, who is a Software engineer working with TCS for the past 12 years. Her domain knowledge varies from health care to retail to banking.

Faculties and students from CSE department participated in the workshop. The workshop focused on making people comfortable with Agile. She involved all the faculty members and students in various activities related to the topic. The workshop also constituted of practical scenarios which focused on various case studies, for better understanding. All the faculty members and students actively participated and successfully completed the workshop.



Expert Lecture by IBM on "Introduction to Data Analytics"



An expert lecture was organized by Mr. Jyoti Sahai, Chairman and Managing Director at Kavaii Business Analytics. The expert lecture was held on 21st August 2017, in AS-24, MRIU campus, Faridabad.

B.Tech 1st Semester CSE (IBM Specialization-BAO)
B.Tech 3rd Semester CSE (IBM Specialization-BAO)
and B.Tech 5th Semester (IBM Specialization-BAO)
attended the lecture. Total of 60 students attended the lecture and the expert focused on Data Analytics and Optimization techniques.

IEEE DAY Celebration

Department of Computer Science and Engineering in association with IEEE CS Chapter Delhi Section, celebrated the 8th IEEE Day on October 05, 2017, at MRIU campus, Faridabad. This global event was celebrated in honor and remembrance of the first IEEE members who gathered to share their technical ideas in 1884. 10th May 2010 commemorates the day of formation of IEEE Manav Rachna International University student branch. Since then the IEEE Student Branch has organized various seminars, workshops, programming contests, conferences etc, which saw an active participation from the students and faculty members and an impressive roster of distinguished speakers, from institutes such as DRDO, DST, Quality Council of India, IIT Delhi, Indira Gandhi National Open University (IGNOU), Indian Statistical Institute (ISI), etc. The celebrations commenced with various technical activities taking place simultaneously such as Poster Competition, Technical Quiz, Code Debugging, LAN Gaming etc. The esteemed dignitaries constituted of Dr. K. Subramanian, Chair, IEEE CS Chapter; Mr. Srikanth Chandrasekaran, Director, Standards & Technology, IEEE Computer Society; Mr. Harish Mysore, Director- India Operations; IEEE Computer Society. Dr. K. Subramanian gave his speech on the topic 'Future Prospects of Technology', whereby he briefly discussed about cloud computing, green computing, Big data, ransomware etc. Mr. Harish Mysore delivered his talk on the topic 'IEEE Standards'. The first position for the Poster Competition was won by the Ms. Tanu Choudhary, FET and the second prize was a tie between Mr. Mahesh Dutt Tripathi, FET and Ms. Anam Taggu, NGFCET, Palwal. Mr Bhavish and Mr. Himanshu, FET, emerged as winners by taking the first position in Technical Quiz whereas Ms Navjot and Ms Kritika, FET gained second position. In Code Debugging, Mr. Akash and Mr. Meetesh from FET won the first position, while Mr. Sahil and Ms. Deepika came second. Lastly, a team of five members won the first position in LAN Gaming with theme 'Debel Gaming', namely Mr Ritin, Mr. Siddharth, Mr. Ayush, Mr. Ashish from FET and Mr. Gayan from INITM, Janak Puri, Delhi. This day proved to be highly inspiring and a huge success, with a total number of about 300 participants in attendance.



Student's Achievements

- Students of Deptt. of CSE underwent a short term Cyber Security Course - under a joint initiative by Manav Rachna and TCG Digital Solutions, since January 05, 2017, completed in March 2017.



- Sujit Roy and Rishav Verma, B. Tech CSE students participated in the project competition event namely Anveshan 2017 in category Health Sciences and Allied Subjects, North Zone in Student Research Convention held at Chitkara University, Punjab and won First position.

- Department of CSE organized a Student-Alumni Interaction on March 24, 2017. Mr. Pratik Singh, Product Manager, Amazon and Mr. Anuj Vadhwa, Entrepreneur, Blimey Fashion, interacted with 6th semester students.



- First year B. Tech CSE student Vaibhav Jha has authored a book namely 'Hack the World before World hacks you', ISBN 9781365802430, published by Lulu, on March 5, 2017. He also is the Founder & CEO of DimCats, Founder & Chief Mentor to DRIC.

- Team Swastika, comprising of three B. Tech (CSE) students namely Sujit Roy, Aakash Bhadana and Vasu Kaushik, participated in the Microsoft Imagine Cup 2017, and showcased remarkable creativity and innovation to push technology forward. They received appreciation certificates for their hard work and dedication.



Department of Computer Science and Engineering



First Row Left to Right: N N Das, Madhulika, Kamlesh, Bindiya Ahuja, charu virmani, Anil Chopra, Krishna Kant, Suresh Kumar, Mukesh, Supriya Panda, Poonam Tanwar, Shefali Singhal, Indu Kashyap, Rachna Bhel, Nitasha Soni

Middle Row: Vaishali Arya, Srishty, Pinki Sagar, Madhumita, Veena Tayal, Meeta Singh, Deepika, Shelja Sharma, Savita Ragi, Geetika Chawla, Tanvi, Ranjeeta Mittal, Monika Shah, Kusum, Neha Garg, Shobha, Smriti, Sonam

Last Row: Prashant Dixit, Amit Chugh, Mohit Chaudhary, Renuka, Versha, Poonam Katyal, Priyanka Grover, Rashima Mahajan, Rosy Madan, Vandana, Urvashi, Pronika, Krishan Kumar, Vasudha, Sanjeev Mehta, Arun Kumar