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CSE TECHNICAL MAGAZINE

• • •

October 2019

NIET
Greater Noida
Estd.2001
GET FUTURE READY

NOIDA INSTITUTE OF ENGINEERING & TECHNOLOGY, GREATER NOIDA

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VISION

To become a prominent department of technical excellence in the field of computing and information system, providing an intellectual, innovative, and inspirational environment to produce competent professionals of the highest ethics equipped with future skills, research potential and attitude to create startups for society.

MISSION

M1: To provide life-long learning environment to strengthen core competencies, innovation, problem-solving skills, ethical values and social responsibility.

M2: To establish industry institute interaction and collaborations to prepare the students to adopt corporate culture with leadership and managerial skills.

M3: To promote technological advancement by providing exposure to latest tools and technologies being implemented in the industry with the help of ICT and MOOCs

M4: To make future ready graduates by promoting research and projects development on cutting-edge technologies in the fast-paced technology-driven environment.

Program Specific Outcomes (PSOs)

PSO 1: The ability to identify, analyze real world problems and design their ethical solutions using artificial intelligence, robotics, virtual/augmented reality, data analytics, block chain technology, and cloud computing.

PSO 2: The ability to design and develop the hardware sensor devices and related interfacing software systems for solving complex engineering problems.

PSO 3: The ability to understand inter disciplinary computing techniques and to apply them in the design of advanced computing.

PSO 4: The ability to conduct investigation of complex problem with the help of technical, managerial, leadership qualities, and modern engineering tools provided by industry sponsored laboratories.

Dr. Sarojini Agarwal
(Chairperson)

The future lies before you like a hidden mass of snow, be careful how you tread on it, for every mark will show.

Dr. Om Prakash Agarwal
(Managing Director)

Success is not a one-shot process. It is an valuable opportunity to rectify errors and move forward. Failure in working for a good cause is better than success in working for a wrong cause. Over the years now, NIET has built quite a special position in the private higher education sector. With its distinctive culture, it provides a clear student-centered environment in which to explore existing technical knowledge, and gain new learning at the leading edges of technology development. Our unique educational system ensures that you gain not just depth and breadth in your chosen area of specialization, but also a holistic set of skills that will equip you to face the real world.

Dr. Neema Agarwal
(AMD)

In the course of last 20 years many technical & management institutes have sprung up all over the country. Graduates passing out every year are highly optimistic, that technical courses ensure a rewarding career. Beyond the academics, the curriculum at NIET is strongly linked with several recent themes like latest technologies needed by organizations, soft skills, communication, among others. Our approach has resulted in programs of study relevant to the leadership trends and challenges of tomorrow. Students regularly undergo personality development and grooming sessions that leads to both extrinsic and intrinsic confidence boosting and prepares them for the corporate world.We appreciate your interest and want you to know that we are here to bring you a leading edge technical education.

Mr. Raman Batra
(EVP)

This new generation is an interesting one. Most of them were born into a world where technology has always been at the forefront. These students rely on Google, texting, social media and Wi-Fi, and they view email - not letter writing - as a formal form of communication.NIET has been helping students write their own stories since its inception. Committed to providing the best jobs by creating life-changing educational opportunities and collaborative learning environments, we have stayed at the forefront of innovation in higher education, providing the tools our students need to make them industry ready from day one and make an impact in the world.

Dr. Vinod M Kapse
(Director)

NIET has always stood for quality and excellence and we make every effort to constantly reminiscent and improve ourselves. These efforts have been recognized, appreciated and awarded by prestigious educational bodies both in India and abroad.I wish you the very best as you choose to become a part of this exciting and vibrant learning community.

Prof. Dr. Chandra Shekhar Yadav
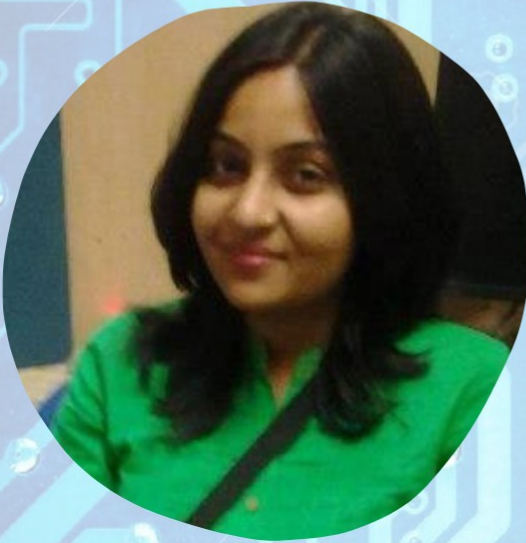## (HOD OF CSE DEPARTMENT)

Students must keep pace with the changing world by acquiring knowledge about latest technologies. This will help them to achieve success and reach new heights in their life.

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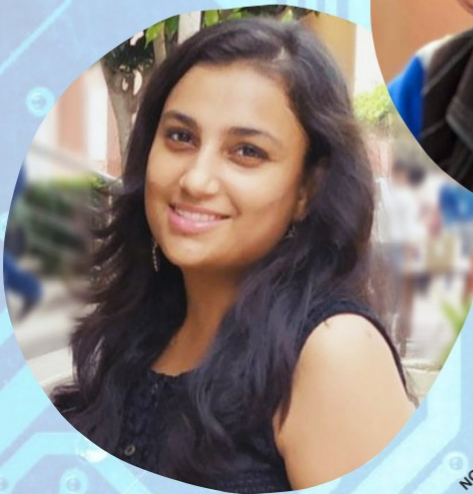**Ms.Megha Gupta**

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About the Department

In Computer Science, NIET is definitely the place to bet on. You can become a part of the tradition of excellence. With rapidly evolving technical and the continuous need for innovation, the department has always produced quality professionals and holds an important position in software industry in India and abroad.

The Department of Computer Science and Engineering at NIET is renowned for its cutting edge research and imparting state-of-the-art education. The department attracts the bright students and faculty members. The faculty members are leaders in advanced computer technologies such as Genetic Algorithm, parallel processing, data mining, computer graphics, and software engineering, cloud computing, mobile applications & network programming.

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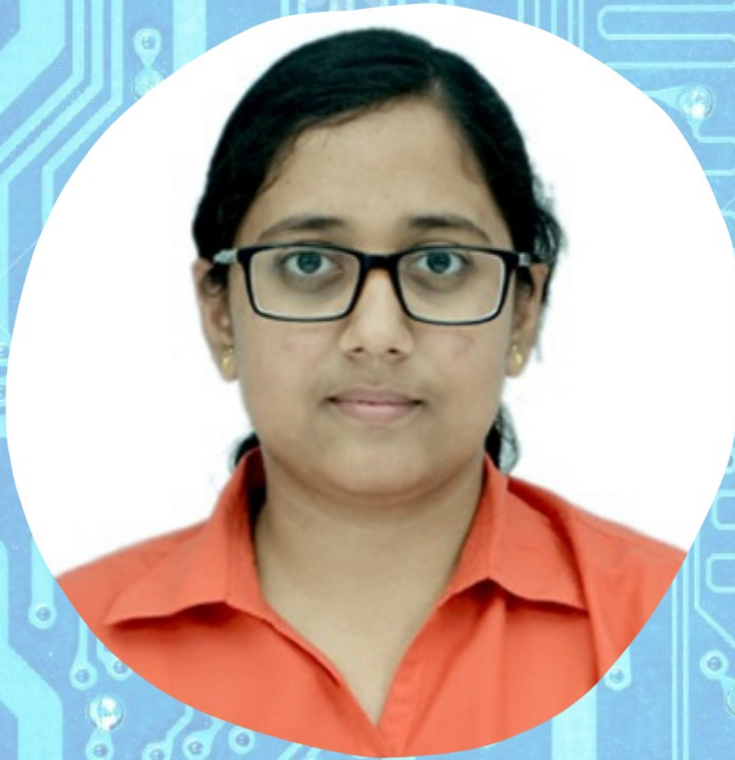& TECHNOLOGY, GREATER NOIDA

Some Articles by Students

ARTIFICIAL INTELLIGENCE

By-
Anunnya Gudhenia

CSE Second Year

ARTIFICIAL INTELLIGENCE (AI) is the simulation of human intelligence processes by machines, especially computer systems. Sometimes called machine intelligence, it is intelligence demonstrated by machines, in contrast to the natural intelligence displayed by humans. Leading AI textbooks define the field as the study of "intelligent agents": any device that perceives its environment and takes actions that maximize its chance of successfully achieving its goals. A quip in Tesler's theorem says, " A is whatever hasn't been done yet." For instance, optical character recognition is frequently excluded from things considered to be AI, having become a routine technology. Modern machine capabilities generally classified as AI include successfully understanding human speech, competing at the highest level in strategic game systems, autonomously operating cars, intelligent routing in content delivery networks, and military simulations.

AI programming focuses on three cognitive skills: learning, reasoning and self correction. Learning processes focus on acquiring data and creating rules for how to turn the data into actionable information. The rules, which are called algorithms, provide computing devices with step-by-step instructions for how to complete a specific task. Reasoning processes focus on choosing the right algorithm to reach a desired outcome. Self-correction processes are designed to continually fine-tune algorithms and ensure they provide the most accurate results possible.

The artificial neural networks and deep learning artificial intelligence technologies are quickly evolving, primarily because AI processes large amounts of data much faster and makes predictions more accurately than humanly possible. AI applications that use machine learning can take huge amounts of data and quickly turn it into actionable information. As of this article, the primary disadvantage of using AI is that it is expensive to process the large amounts of data that AI programming requires.

Weak or Strong Artificial Intelligence:

AI can be categorized as either weak or strong. Weak AI, also known as narrow AI, is an AI system that is designed and trained to complete a specific task. This kind of artificial intelligence operates within a limited context and is a simulation of human intelligence. Industrial robots and virtual personal assistants, such as Apple's Siri, use weak AI. While these machines may seem intelligent, they are operating under far more constraints and limitations than even the most basic human intelligence. Strong AI, also known as artificial general intelligence (AGI), describes programming that can replicate human cognitive abilities. When presented with an unfamiliar task, a strong AI system can use fuzzy logic to apply knowledge from one domain to another and find a solution autonomously. In theory, a strong AI program should be able to pass both a Turing test and the Chinese room test.

Ethical Use of Artificial Intelligence:

While AI tools present a range of new functionality for businesses, the use of artificial intelligence also raises ethical questions because, for better or worse, an AI system will reinforce what it has already learned. This can be problematic because machine learning algorithms, which underpin many of the most advanced AI tools, are only as smart as the data they are given in training. Because a human being selects what data is used to train an AI program, the potential for machine learning bias is inherent and must be monitored closely.

Anyone looking to use machine learning as part of real-world, in-production systems needs to factor ethics into their AI training processes and strive to avoid bias. This is especially true when using AI algorithms that are inherently unexplainable in deep learning and generative adversarial network (GAN) applications.

Explainability And Artificial Intelligence:

Explainability is a potential stumbling block to using AI in industries that operate under strict regulatory compliance requirements. For example, financial institutions in the United States operate under regulations that require them to explain their credit-issuing decisions. When a decision to refuse credit is made by AI programming, however, it can be difficult to explain how the decision was arrived at because the AI tools used to make such decisions operate by teasing out subtle correlations between thousands of variables. When the decision-making process cannot be explained, the program may be referred to as black box AI.

Components Of AI:

As the hype around AI has accelerated, vendors have been scrambling to promote how their products and services use AI. Often what they refer to as AI is simply one component of AI, such as machine learning. AI requires a foundation of specialized hardware and software for writing and training machine learning algorithms. No one programming language is synonymous with AI, but a few, including Python and C, have set themselves apart.

Four Types Of Artificial Intelligence:

Arend Hintze, an assistant professor of integrative biology and computer science and engineering at Michigan State University, categorized AI into four types, beginning with the intelligent systems that exist today to sentient systems, which do not yet exist. His categories are as follows:

Type 1: Reactive machines- These AI systems have no memory and are task specific. An example is Deep Blue, the IBM chess program that beat Garry Kasparov in the 1990s. Deep Blue can identify pieces on the chessboard and make predictions, but because it has no memory, it cannot use past experiences to inform future ones.

Type 2: Limited memory-- These AI systems have memory, so they can use past experiences to inform future decisions. Some of the decision-making functions in self-driving cars are designed this way.

Type 3: Theory of mind-- Theory of mind is a psychology term. When applied to AI, it means that the system would understand emotions. This type of AI will be able to infer intentions and predict behavior when it becomes available.

Type 4: Self-awareness-- In this category, AI systems have a sense of self, which gives them consciousness. Machines with self-awareness understand their own current state. This type of AI does not yet exist.

Examples of AI Technology

AI is incorporated into a variety of different types of technology. Here are seven examples:

Automation- This makes a system or process function automatically. For example, robotic process automation (RPA) can be programmed to perform high-volume, repeatable tasks that humans normally performed. RPA is different from IT automation in that it can adapt to changing circumstances.

Machine learning- This is the science of getting a computer to act without programming. Deep learning is a subset of machine learning that, in very simple terms, can be thought of as the automation of predictive analytics. There are three types of machine learning algorithms:

Supervised learning- Data sets are labeled so that patterns can be detected and used to label new data sets.

Unsupervised learning- Data sets aren't labeled and are sorted according to similarities or differences.

Reinforcement learning- Data sets aren't labeled but, after performing an action or several actions, the AI system is given feedback.

Machine vision- This is the science of allowing computers to see. This technology captures and analyzes visual information using a camera, analog-to digital conversion and digital signal processing. It is often compared to human eyesight, but machine vision isn't bound by biology and can be programmed to see through walls, for example. It is used in a range of applications from signature identification to medical image analysis.

Computer Vision- which is focused on machine-based image processing, is often conflated with machine vision.

Natural Language Processing- This is processing of human- and not computer-- language by a computer program. One of the older and best-known examples of NLP is spam detection, which looks at the subject line and the text of an email and decides if it's junk. Current approaches to NLP are based on machine learning. NLP tasks include text translation, sentiment analysis and speech recognition. Robotics. This field of engineering focuses on the design and manufacturing of robots. Robots are often used to perform tasks that are difficult for humans to perform or perform consistently. They are used in assembly lines for car production or by NASA to move large objects in space. Researchers are also using machine learning to build robots that can interact in social settings.

Self-driving cars- These use a combination of computer vision, image recognition and deep learning to build automated skill at piloting a vehicle while staying in a given lane and avoiding unexpected obstructions, such as pedestrians.

Artificial Intelligence Applications:

Artificial intelligence has made its way into a wide variety of markets. Here are six examples:

AI in healthcare-- The biggest bets are on improving patient outcomes and reducing costs. Companies are applying machine learning to make better and faster diagnoses than humans. One of the best-known healthcare technologies is IBM Watson. It understands natural language and can respond to questions asked of it. The system mines patient data and other available data sources to form a hypothesis, which it then presents with a confidence scoring schema.

Other AI applications include chatbots, a computer program used online to answer questions and assist customers, to help schedule follow-up appointments or aid patients through the billing process and virtual health assistants that provide basic medical feedback.

AI in business-- Robotic process automation is being applied to highly repetitive tasks normally performed by humans. Machine learning algorithms are being integrated into analytics and CRM platforms to uncover information on how to better serve customers. Chatbots have been incorporated into websites to provide immediate service to customers. Automation of job positions has also become a talking point among academics and IT analysts.

AI in education-- AI can automate grading, giving educators more time. It can assess students and adapt to their needs, helping them work at their own pace. AI tutors can provide additional support to students, ensuring they stay on track. And it could change where and how students learn, perhaps even replacing some teachers.

AI in finance- AI in personal finance applications, such as Intuit's Mint or TurboTax, is disrupting financial institutions. Applications such as these collect personal data and provide financial advice. Other programs, such

as IBM Watson, have been applied to the process of buying a home. Today, artificial intelligence software performs much of the trading on Wall Street.

AI in law-- The discovery process-- sifting through documents-- in law is often overwhelming for humans. Automating this process is a more efficient use of time. Startups are also building question-and-answer computer assistants that can sift programmed-to-answer questions by examining the taxonomy and ontology associated with a database.

AI in manufacturing-- This is an area that has been at the forefront of incorporating robots into the workflow. Industrial robots used to perform single tasks and were separated from human workers, but as the technology advanced that changed.

AI in banking-- Banks have been finding good results in using chatbots to make their customers aware of additional services and offerings. They are also using AI to improve decision-making for making loans, setting credit limits and identifying investment opportunities.

Artificial Intelligence in Security:

AI and machine learning are at the top of the buzzword list security vendors are using today to differentiate their offerings. Those terms also represent truly viable technologies. Artificial intelligence and machine learning in cybersecurity products are adding real value for the security teams looking for ways to identify attacks, malware and other threats. Organizations today use machine learning in security information and event management (SIEM) software and related areas to detect anomalies and identify suspicious activities that indicate threats. By analyzing data and using logic to identify similarities to known malicious code, AI can provide alerts to new and emerging attacks much sooner than human employees and previous technology iterations. As a result, AI security technology both dramatically lowers the number of false positives and gives organizations more time to counteract real threats

before damage is done. The maturing technology is playing a big role in helping organizations fight off cyber attacks

History Of Artificial Intelligence:

Intelligent robots and artificial beings first appeared in the ancient Greek myths of Antiquity. Aristotle's development of the syllogism and it's use of deductive reasoning was a key moment in mankind's quest to understand its own intelligence. While the roots are long and deep, the history of artificial intelligence as we think of it today spans less than a century. The following is a quick look at some of the most important events in AI.

1943--Warren McCullough and Walter Pitts publish "A Logical Calculus of Ideas Immanent in Nervous Activity." The paper proposed the first mathematic model for building a neural network.

1949-- In his book The Organization of Behavior: A Neuro-psychological Theory, Donald Hebb proposes the theory that neural pathways are created from experiences and that connections between neurons become stronger the more frequently they're used. Hebbian learning continues to be an important model in AI.

1950-- Alan Turing publishes "Computing Machinery and Intelligence, proposing what is now known as the Turing Test, a method for determining if a machine is intelligent. During the same year, Harvard undergraduates Marvin Minsky and Dean Edmonds build SNARC, the first neural network computer and Claude Shannon publishes the paper "Programming a Computer for Playing Chess."

1952-- Arthur Samuel develops a self-learning program to play checkers

1954--The Georgetown-IBM machine translation experiment automatically translates 60 carefully selected Russian sentences into English.

1956--The phrase artificial intelligence is coined at the "Dartmouth Summer Research Project on Artificial Intelligence." Led by John McCarthy, the conference, which defined the scope and goals of AI, is widely considered to be the birth of artificial intelligence as we know it today.

1958--John McCarthy develops the AI programming language Lisp and publishes the paper "Programs with Common Sense." The paper proposed the hypothetical Advice Taker, a complete AI system with the ability to learn from experience as effectively as humans do.

1959--Allen Newell, Herbert Simon and J.C. Shaw develop the General Problem Solver (GPS), a program designed to imitate human problem-solving.

1963--John McCarthy starts the AI Lab at Stanford.

1969-- The first successful expert systems are developed in DENDRAL, a XX program, and MYCIN, designed to diagnose blood infections, are created at Stanford.

1972--The logic programming language PROLOG is created.

1980--Digital Equipment Corporations develops R1 (also known as XCON), the first successful commercial expert system. Designed to configure orders for new computer systems, R1 kicks off an investment

boom in expert systems that will last for much of the decade, effectively ending the first "AI Winter."

1982--Japan's Ministry of International Trade and Industry launches the ambitious Fifth Generation Computer Systems project. The goal of FGCS is to develop supercomputer-like performance and a platform for AI development.

1985--Companies are spending more than a billion dollars a year on expert systems and an entire industry known as the Lisp machine market springs up to support them. Companies like Symbolics and Lisp Machines Inc. build specialized computers to run on the AI programming language Lisp.

1991--U.S. forces deploy DART, an automated logistics planning and scheduling tool, during the Gulf War.

1997--IBM's Deep Blue beats world chess champion Gary Kasparov.

2005--STANLEY, a self-driving car, wins the DARPA Grand Challenge.

2008--Google makes breakthroughs in speech recognition and introduces the feature in its iPhone app.

2012--Andrew Ng, founder of the Google Brain Deep Learning project, feeds a neural network using deep learning algorithms 10 million YouTube videos as a training set. The neural network learned to recognize a cat without being told what a cat is, ushering in breakthrough era for neural networks and deep learning funding.

2014--Google makes first self-driving car to pass a state driving test.

2016--Google Deep Mind's AlphaGo defeats world champion Go player Lee Sedol. The complexity of the ancient Chinese game was seen as a major hurdle to clear in AI.

Bug Bounty

By-
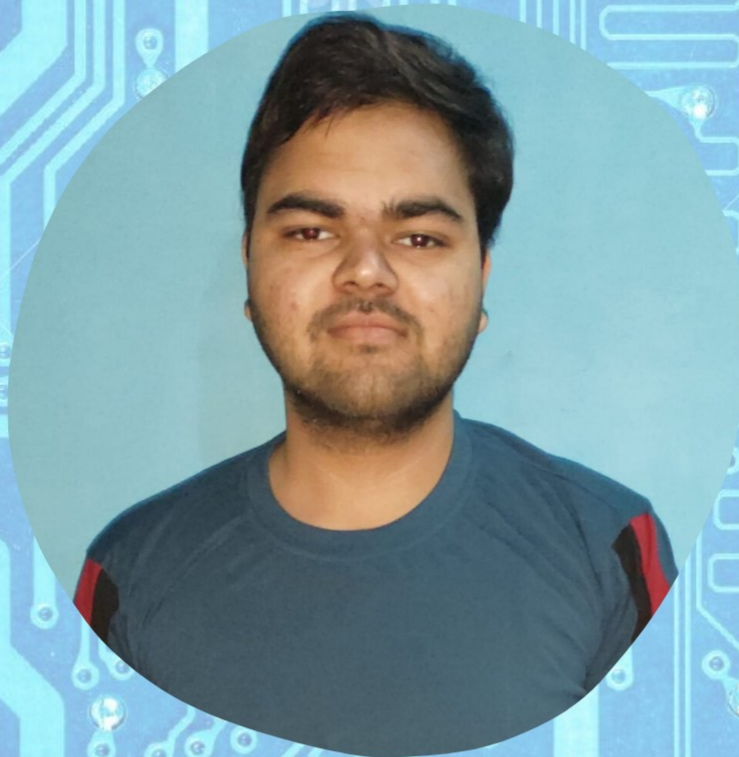# Prakhar Agarwal

CSE Second Year

Bug Bounty is a lucrative career path of 21st century and it has just begun to set its foot in industry. All the companies that run an active bug bounty program offer a bounty or lump-sum money to the person who finds a vulnerability (or bug) in their implementation of Web Application or Mobile Applications.

Why go for Bug Bounty at all?

Most people choose this field of Computer Science because of the fun of finding flaws in applications, extend their knowledge base of technology or the monetary reward that comes with it. The minimum pay for a bounty if not duplicated are swags, recognitions and
monetary benefits range from 50$ to 10000$ and if you are lucky enough few companies like google has rewards of 100000$ to even a million $ based on severity of bug found and how much they can the infrastructure or reveal user private data.

Getting started in bug bounty

Here is a small introduction to how you can start your bug bounty career with the points that must be kept in mind before getting started.

Obstacles in Path

Bug Bounty has a large mountain of learning that needs to be climbed before even be able to start your contributions to any organization or company. So, don't be exhausted in middle of the journey it sometimes gets frustrated spending hours in learning and getting nothing but it's just a part of learning and keep yourself motivated throughout this wonderful journey. Eat healthy, keep your mind fit, socialize with people and most important is just practice, practice and practice keep practicing the concepts and applying them on real targets and even those isolated environments offered by different VMs and Vulnerable Web Applications offered by OWASP.

What this write-up is about?

This write-up helps you get a clear understanding of what bug bounty is about for further reading and resources do research on this topic through various resources such as pentester.land, OWASP TOP 10, OverTheWire has some fun games to teach security concepts, BugCrowd University, Defcon Conferences and read some articles on medium.com are places where you can learn in depth about bug bounty.

Keep in mind the fact it's still hacking but in an organized manner

Always keep in mind the legal matters, checkout out of scope section of a bounty and never scan the target or perform DDOS attacks or attack the organization's network.

Looking for higher bounties or more bugs?

If you want to find bugs in a Web Application that is not listed in any bug bounty, you can email the security team and request them to allow you to test the Web Application. Participate in private programs of Hackerone and Bugcrowd etc, these are the programs offered by startups. So they usually have high number of vulnerabilities or bugs that needs to be patched.

Where to practice these new skills?

You can practice them in a virtual environment or on projects made by different companies or organizations such as Google, OWASP, VulnHub and play CTFs organized by different sites they are listed on ctftime.org
- bWAPP
- Game of Hacks
- HackThis
- OverTheWire
- OWASP Juice Shop
- WebGoat

What is a Bug?

Software Bug is an error, flaw or fault in a computer program or system that causes it to produce an incorrect or unexpected result, or to behave in unintended ways.

History of Bug

The term "bug" was first used in 1946, when Hopper was released from active duty, she joined the Harvard Faculty at the Computation Laboratory where she continued her work on the Mark II and Mark III. Operators traced an error in the Mark II to a moth trapped in a relay, coining the term *bug*. This bug was carefully removed and taped to the log book. Stemming from the first bug, today we call errors or glitches in a program a bug.

What are Bug Bounty Programs?

A bug bounty program is a deal offered by many websites, organizations and software developers by which individuals can receive recognition and compensation for reporting bugs, especially those pertaining to exploits and vulnerabilities. These programs allow the developers to discover and resolve bugs before the general public is aware of them, preventing incidents of widespread abuse. Bug bounty programs have been implemented by a large number of organizations, including Mozilla, Facebook, Yahoo!, Google, Reddit, Square, and Microsoft.

History of Bug Bounty

Hunter & Ready initiated the first known bug bounty program in 1983 for their Versatile Real-Time Executive operating system. Anyone who found and reported a bug would receive a Volkswagen Beetle (a.k.a. Bug) in return. A little over a decade later in 1995, Jarrett Ridlinghafer, a technical support engineer at Netscape Communications Corporation coined the phrase 'Bugs Bounty'.

Vulnerability Disclosure Policy Violations

In August 2013, a Palestinian Computer Science student reported a vulnerability that allowed anyone to post a video on an arbitrary account. According to the email communication between the student and Facebook, he attempted to report the vulnerability using Facebook's bug bounty program but the student was misunderstood by Facebook's engineers. Later he exploited the vulnerability using the Facebook profile of Mark Zuckerberg, resulting into Facebook denying to pay him a bounty.

India's place in Bug Bounty

India, which has either the first or second largest number of bug hunters in the world, depending on which report one cites, also tops the Facebook Bug Bounty Program with the largest number of valid bugs. "India came out on top with the number of valid submissions in 2017, with the United States and Trinidad & Tobago in second and third place, respectively", Facebook quoted in a post.

Notable programs

In October 2013, Google announced a major change to its Vulnerability Reward Program. Previously, it had been a bug bounty program covering many Google products. With the shift, however, the program was broadened to include a selection of high-risk free software

applications and libraries, primarily those designed for networking or for low-level operating system functionality. Submissions that Google found adherent to the guidelines would be eligible for rewards ranging from $500 to $3133.70. In 2017, Google expanded their program to cover vulnerabilities found in applications developed by third parties and made available through the Google Play Store. Similarly, Microsoft and Facebook partnered in November 2013 to sponsor The Internet Bug Bounty, a program to offer rewards for reporting hacks and exploits for a broad range of Internet-related software. The software covered by the IBB includes Adobe Flash, Python, Ruby, PHP, Django, Ruby on Rails, Perl, OpenSSL, Nginx, Apache HTTP Server, and Phabricator. In addition, the program offered rewards for broader exploits affecting widely used operating systems and web browsers, as well as the Internet as a whole.

Platform for Bug Bounty

Hackerone

Among the bug bounty programs, Hackerone is the leader when it comes to accessing hackers, creating your bounty programs, spreading the word, and assessing the contributions.

Bugcrowd

Bugcrowd offers several solutions for security assessments, one of them being Bug Bounty. It provides a SaaS solution that integrates easily into your existing software lifecycle and makes it a snap to run a successful bug bounty program.

Intigriti

Intigriti is a comprehensive bug bounty platform that connects you with white hat hackers, whether you want to run a private program or a public one. For hackers, there's plenty of bounties to grab. Depending on the company's size and industry, bug hunts ranging from €1,000 to €20,000 are available.
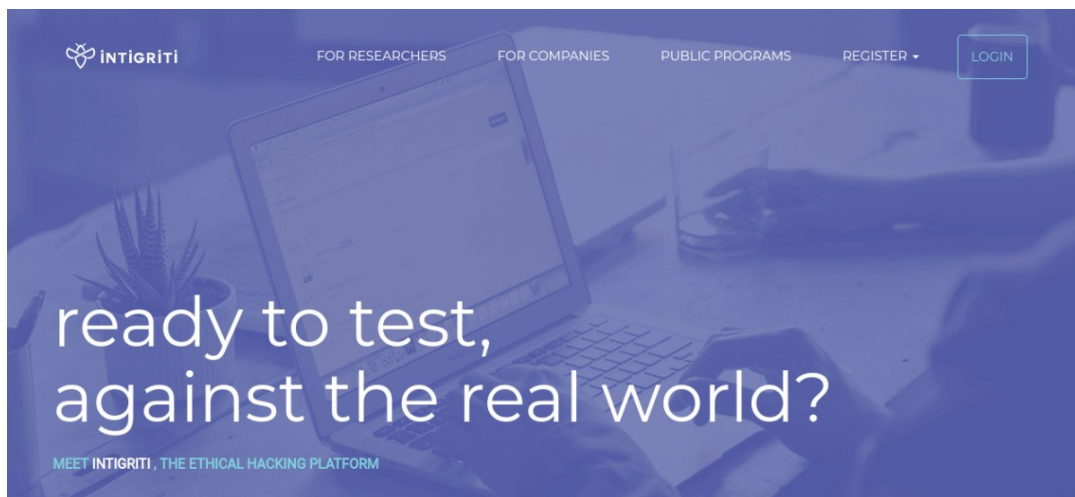

Vulnerability Prioritization

The only way for a security team to effectively manage risk is vulnerability prioritization and management. There are many different prioritization models used across the industry that are based on vulnerability risk and impact. Without a clear prioritization model, how do you know what to fix first? Highest CVSS Score? FIFO? LIFO?

Externally known issues? Whatever your prioritization plan is, it needs to be documented and updated as threats to your business change.

All valid bugs are assigned a priority rating based on the severity of the security impact – higher severity issues that are rated as Critical such as SQL resulting in remote code execution receive higher rewards than low severity issues.
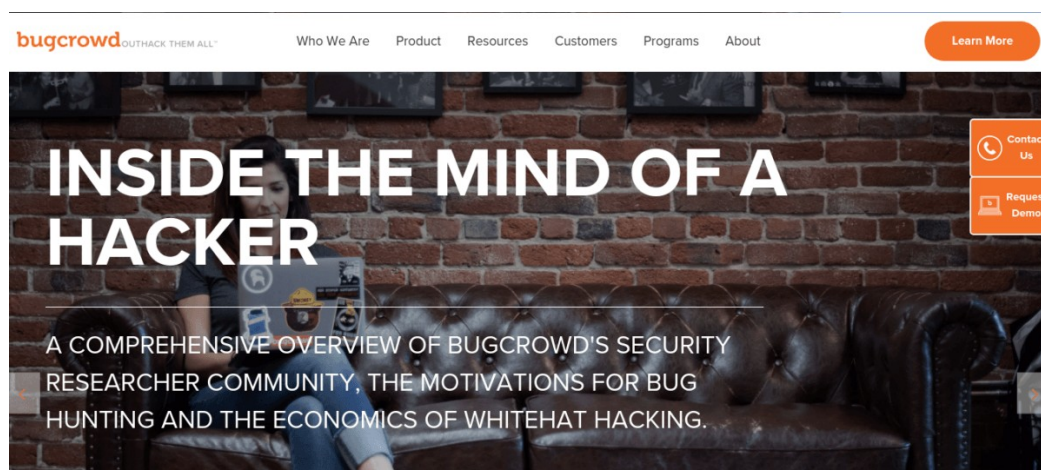
P1 – CRITICAL – 40 kudos points

Vulnerabilities that cause a privilege escalation on the platform from unprivileged to admin, allows remote code execution, financial theft, etc. Examples: vulnerabilities that result in Remote Code Execution such as Vertical Authentication bypass, SSRF, XXE, SQL Injection, User authentication bypass.

P2 – HIGH – 20 kudos points

Vulnerabilities that affect the security of the platform including the processes it supports. Examples: Lateral authentication bypass, Stored XSS, some CSRF depending on impact.

P3 – MEDIUM – 10 kudos points

Vulnerabilities that affect multiple users, and require little or no user interaction to trigger. Examples: Reflective XSS, Direct object reference, URL Redirect, some CSRF depending on impact.

P4 – LOW – 5 kudos points
Issues that affect singular users and require interaction or significant prerequisites (MITM) to trigger. Examples: Common flaws, Debug information, Mixed Content.

P5 – BIZ ACCEPTED RISK – 0 kudos points

Non-exploitable weaknesses and "won't fix" vulnerabilities. Examples: Best practices, mitigations, issues that are by design or acceptable business risk to the customer such as use of CAPTCHAS.

Target

The targets for a bug bounty program are the applications & services that you're allowed to hack on. Make sure to note the finer details in the Targets listing, as there is a big difference between "bugcrowd.com" and "*.bugcrowd.com". The asterisk (*) in the sub-domain section of a domain indicates that all sub-domains are in scope, unless otherwise detailed in the Out of Scope section of the bounty brief.
The targets list can and often will include a mix of web, mobile, IOT, API and other targets.

Out of Scope

The out of scope section of a bounty brief lists the types of security findings & bugs that will excluded from the bounty. Many Out of Scope listings will also include types of testing that are not allowed, often including DDoS attacks, phishing and social engineering. Going out of scope of a bounty is risky as it can result in no reward and receiving a negative reputation on the Bugcrowd platform.
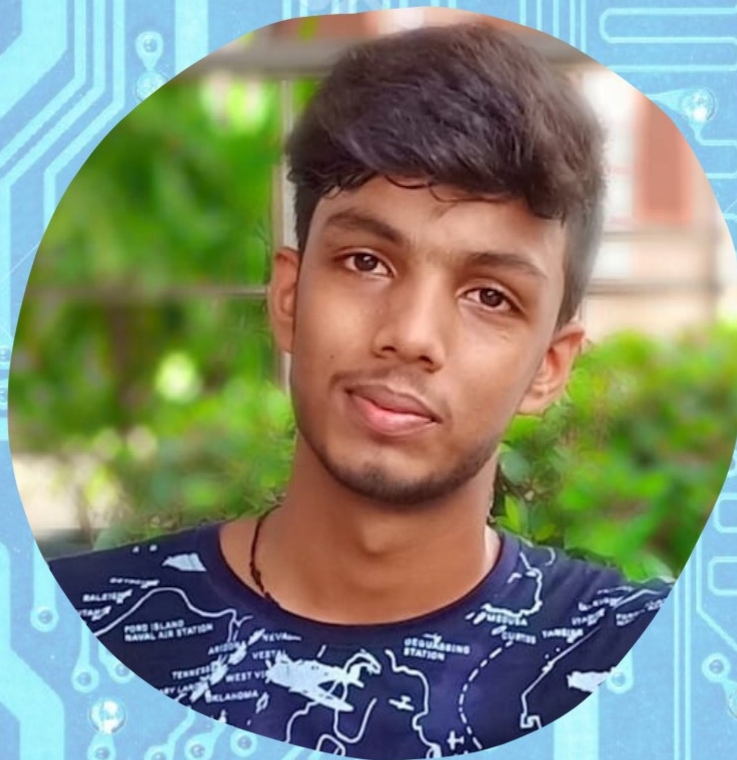
Starlink Broadband

By-
Prajesh Gupta

CSE Second Year

Tesla founder and CEO Elon Musk is not afraid to shill for his company's products, but he gets fewer chances with his work at SpaceX. After all, most of us aren't in the market for space launch services, but we might be interested in satellite internet as an alternative to the widely reviled terrestrial ISPs. SpaceX is working toward deploying thousands of internet satellites for its Starlink system, and Musk just sent the first tweet using the space-based satellite network.

The tweet in question doesn't provide any new information about how the service works, when you can have it, or how much it will cost. No, it's just Musk saying that he sent the tweet via a Starlink satellite in space. He followed that tweet up with another reading "Whoa, it worked!!"

We can chalk up Musk's surprise not to the fact that he sent a tweet via space, but that SpaceX's Starlink network successfully pushed the post through. Several satellite internet providers have been transmitting data from place to place using satellites for decades, but Starlink aims to be better than those. Traditional satellite internet is a last resort for people in remote areas who can't get more reliable options. So, they're willing to put up with slow speeds and high latency.

SpaceX has already launched a few dozen Starlink satellites earlier this year, but the eventual Starlink constellation could consist of tens of thousands of individual satellites. Some of those will be in very low orbits that allow them to reduce latency for users on the surface. Musk initially wanted to have 2,000 satellites in orbit by the end of the year, but it doesn't look like he'll hit that goal.

When the first batch of satellites went up, SpaceX had plans to launch a total of 12,000 in the coming years. More recently, it has talked about boosting that number by as much as 30,000. That has

other satellite operators and space agencies a little concerned — space is big, but it's not *that* big. With just 60 satellites in its fleet, an ESA satellite nearly smacked into one of them last month. A fleet of thousands will be much more difficult to track and manage.

The ESA has called for more effective traffic management rules to prevent future collisions.

SpaceX president Gwynne Shotwell said the goal is to complete six to eight Starlink launches to get sufficient coverage to start offering the service to consumers in 2020.

WASHINGTON — SpaceX is confident it can start offering broadband service in the United States via its Starlink constellation in mid-2020, the company's president and chief operating officer Gwynne Shotwell said Oct. 22.

Getting there will require the company to launch six to eight batches of satellites, Shotwell told reporters during a media roundtable. SpaceX also has to finish the design and engineering of the user terminals, which is not a minor challenge, Shotwell acknowledged.

SpaceX CEO Elon Musk has a Starlink terminal at his house and he used it to send a tweet early on Oct. 22."Sending this tweet through space via Starlink satellite," he tweeted to his 29 million followers. "Whoa, it worked!!"

Shotwell said SpaceX will need to complete six to eight Starlink launches — including the one that already took place in May — to ensure continuous service in upper and lower latitude bands. "We need 24 launches to get global coverage," she said. "Every launch after that gives you more capacity."

The company caused a stir last week when it requested the International Telecommunication Union to approve spectrum for 30,000 additional Starlink satellites to build the world's largest low-Earth orbit broadband constellation. This was in addition to 12,000 already approved by the U.S. Federal Communications Commission.

Shotwell said SpaceX is not certain that will need that many satellites. Far fewer are needed for global coverage but the company wants extra spacecraft to be able to offer customers customized service options. Starlink is a mesh network of satellites connected to each other by space lasers.

"We'll continue to upgrade the network until mid to late next year," said Shotwell. "We're hoping for 24 launches by the end of next year."

Shotwell said many of the Starlink features are being tested by the U.S. Air Force Research Laboratory under a program called Global Lightning. SpaceX in December 2018 received a $28 million contract to test over the next three years different ways in which the military might use Starlink broadband services. So far, SpaceX has demonstrated data throughput of 610 megabits per second in flight to the cockpit of a U.S. military C-12 twin-engine turboprop aircraft.

Shotwell recognized a lot of this is uncharted territory for SpaceX. "This is very different business for SpaceX," she said. "It's leveraging space technology but it's a consumer business."

She said Starlink is considered "additive to our business," meaning that it will not replace space launch services as SpaceX's primary source of revenue.

SpaceX will have to hire a whole new workforce to deal with sales, tech support and product engineering. User terminals are a major concern.

"The more engineering we do on the user terminal, the less service people we will have to hire," said Shotwell, Terminals are one aspect of the Starlink business that the company has to "get right," she said.

When consumers sign up, "they are going to receive a box from SpaceX" with a user terminal and a cord, said Shotwell. How that gets connected and where the terminals should be placed in someone's home are still issues to be ironed out. "We still have a lot to do to get that right," said Shotwell.

"Knowing Elon, he wants everything to be beautiful. So the user terminal will be beautiful."

The price point is also being studied. Shotwell said millions of people in the U.S. pay $80 per month to get "crappy service." She didn't say whether Starlink will cost more or less than $80 per month but suggested that would be a segment of the public the company would target as well as rural areas that currently have no connectivity.

Outside the United States, SpaceX is working nation by nation to get authorization to offer the service. "Every country has its own process," said Shotwell.

The terminals today are being produced at SpaceX's factory in Hawthorne, California. But mass manufacturing in the future will move to a different location Shotwell declined to name.

SpaceX is racing to get Starlink in operation as several other companies continue to build competing broadband constellations. Shotwell said there is probably room in the market for at least two competitors. "If we do well and make money, there will be competitors."

As more Starlink launches are planned, SpaceX wants to use previously flown Falcon boosters as much as possible, said Shotwell. "I think we'll manage the fleet how best we manage the fleet," she said. "Our intent is to use Starlink to push the capability of those boosters and see how many missions they can do."

A single Falcon booster was designed for 10 flights. The next Starlink mission scheduled in mid-November will be launched by a booster on its fourth light.
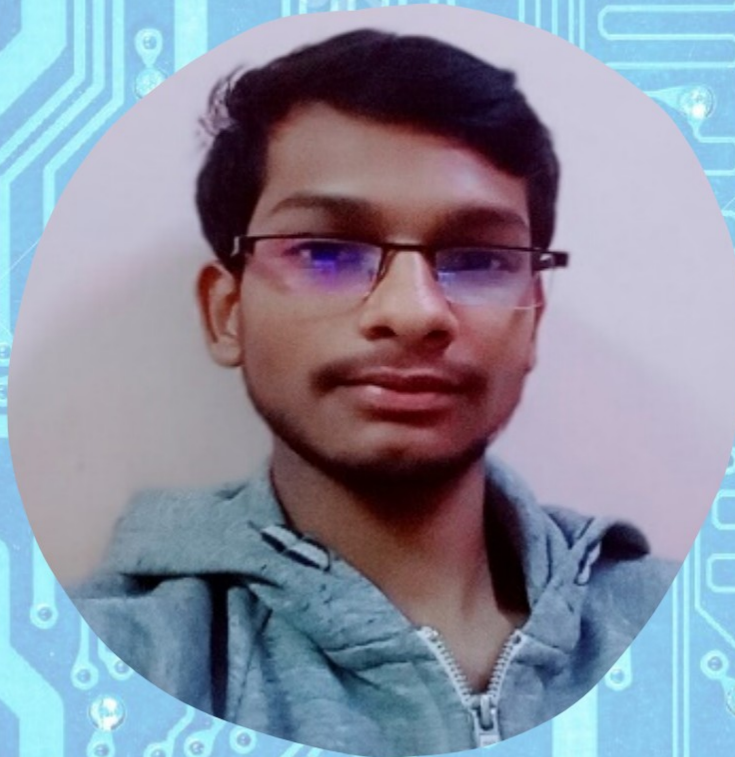
ANDROID DEVELOPMENT

By-
Shivansh Goel

CSE Third Year

Android Technology in World

Technology has spread its wings all over, all geographies, all domains, all segments are smitten using technological advancements in some or the other way. Life has become simple, reachable and more productive, thanks to these progressions….

As we observe the year gone by, there were many innovations in the world of mobile apps. Much was written, much was perceived, and much was leveraged in the mobile app development arena by us.
Mobile applications are evolving at a meteor pace to give users a rich and fast user experience.
Mobility solutions for Healthcare become the second skin these days especially with the fact that the mobile apps are steadily and increasingly leveraging technologies in trend. Apps for devices like watches, fitness bands, commonly used appliances, and manufacturing devices are taking solutions to a different level altogether giving an unimaginable push to healthcare mobility solutions….

In the advancing world of technology, Mobile applications are a rapidly growing segment of the global mobile market. Google released Android which is an open-source mobile phone operating system with Linux-based platform. It consists of the operating system, middleware, and user interface and application software.

Android is about to become the most widely used OS on mobile phones, but with Android comes a security vulnerability that few users take into account. On Android Market, where you can download thousands of applications for Android, anyone can upload their programs without having to submit them to careful security checks. This makes Android a prime target for computer criminals.

Introduction to Android

Android is a new, next-gen mobile operating system that runs on the Linux Kernel. Android Mobile Application Development is based on Java language codes, as it allows developers to write codes in the Java language. These codes can control mobile devices via Google-enabled Java libraries. It is an important platform to develop mobile applications using the software stack provided in the Google Android SDK. Android mobile OS provides a flexible environment for Android Mobile Application Development as the developers normal Java IDEs. The software developers at Mobile Development India have expertise in developing applications based on Android Java Libraries and other important tools. Android Mobile Application Development can be used to create innovative and dynamic third party applications. Mobile Development India has worked extensively on projects ranging from gaming software, organizers, media players, picture editors to go-cart devices and more. The platform was officially announced and the SDK tools were available in October 2008. Currently there is only one mobile phone that runs the Android OS, the G1 from TMobile.

Application Fundamentals

Java and XML are the two main programming languages used in Android App development. Knowledge and mastery over these programming languages are, therefore, prerequisites to developing an Android app. However, it is important to remember that they are not executed using the standard Java Virtual Machine (JVM).Instead, Google has created a custom VM called Dalvik which is responsible for converting and executing Java byte code. All custom Java classes must be converted into a Dalvik compatible instruction set before being executed into an Android operating system.

Android Platform overview

Android is a software stack for mobile devices that includes an operating system, middleware and key applications. The Android SDK provides the tools and APIs necessary to begin developing applications on the Android platform using the Java programming language. The system services such as security, memory management, process management are controlled by Linux.

Developing Android Applications

The Android SDK provides an extensive set of application programming interfaces (APIs) that is both modern and robust. Android handset core system services are exposed and accessible to all applications. When granted the appropriate permissions, Android applications can share data among one another and access shared resources on the system securely Android applications are written in Java programming language.

Application Framework

By providing an open development platform, Android offers developers the ability to build extremely rich and innovative applications. Developers are free to take advantage of the device hardware, access location information, run background services, set alarms, add notifications to the status bar, and much, much more. Developers have full access to the same framework APIs used by the core applications.

Making the Right Choice over Needed Tools

The simple tools that you need for Android app development are just a Mac or Windows PC, any type of Linux, and Eclipse, the ADT Plug in, and the Android SDK—all of which are free. You can go through the installation guide on Google to learn how to set up your development environment; it provides documentation of everything needed. Android

has some unique parameters that you should consider when writing an Android app. Application component are the essential building blocks of Android app development. Each of the components is a different point by which the system can enter your app. Although each one of them exists as its own entity and plays a specific role, there are some which depend on each other, and not all of them are actual entry points.

ANDROID SECURITY FRAMEWORK

The Google Android mobile phone platform is one of the most anticipated smartphone operating systems. Smart phones can be used in place of Computers/Laptops. As mobile devices attain increasing capabilities, there are many more opportunities for novel applications development. Recent development of mobile application development has reached a high demand on today's cellular market. Android defines a new component-based framework for developing mobile applications, where each application is comprised of different numbers and types of components. Activity components are the basis of the user interface each screen presented to the user is a different Activity. Service components provide background processing that continues even after its application loses focus. Content Provider components share information in relational database form. SQLite is embedded into android which supports relational database. Broadcast Receiver components act as an asynchronous mailbox for messages from the system and other applications. As a whole, this application framework supports a flexible degree of collaboration between applications, where dependencies can be as simple or complex as a situation requires.

FUTURE WORK

The era of mobile web application has just started, and there is a long way for it to march. Development of mobile web application will be emphasized on following aspects:

☼ More and more sensors will be added to mobile phones, so new APIs to use those capabilities will bring brand new applications to users.

☼ Multimedia capabilities will be enhanced and engine will support more types of multimedia such as flash and svg.

☼ The dedicated Integrated Development Environment (IDE)will be improved to accelerate the applications' development.

☼ Visualization programming and JavaScript debugging will be the most important functions of the IDE.

Few Questions answered by Head Of Department

Question:1- Tell us about your experience in the education industry and what makes it the best industry to work in?

Answer: I stared my career in the education industry in 1998 with Meerut Institute of Engineering & Technology, Meerut as Lecture. Now I am professor & Head, Department of Computer Science & Engineering, NIET, Greater Noida. I have been teaching in this Institute since 2005. In starting teaching was professor centric now it is student centric. Future of Education Industry is very bright. Still there is lack of well qualified teachers in this Industry. Everyone wants excellent teacher for their sons/daughter but no one wants send them in teaching profession. Teaching profession is noble job. Society should respect teacher as they respected in Ancient India. I think that there should be guru and shishya relationship between teacher and student not like salesman and customer.

Question:2- How do you ensure that students in Noida Institute of Engineering & Technology get pragmatic and viable experience for survival in their respective careers?

Answer: NIET has established Pyramid and Finishing School for preparing its students future ready. Its work on five modules such as Image Edge, Techie Edge, Sharpen Skill Edge, Corporate Edge, and Fork Edge for the overall development of our students. NIET has developed various industry supported labs for bridging the gap between Industry and Academia such as DELL-EMC Data Science and Big Data Analytics Lab, CISCO Networking Lab, IOT Lab, Apple ios and Android Mobile Application Development Lab, Automation and Robotics Lab, Intel Intelligent Lab etc. Our students get practical exposure on future skills through this lab. Through this our students easily got placed in IT industry with high package. CSE branch of NIET is most demanding branch our almost all students are placed in MNCs and IT Industries. We make our students fittest for surviving in the global environment of competition.

Question:3- You have numerous publications in National & International

journals and a book 'Modeling of Simulation Concepts', please share your comprehensive experience as an Author.

Answer: I have published 32 research papers in various journal of repute and in international and national conferences. I have co-authored book Modeling and Simulation Concepts Luxmi Publication New Delhi. This is one of the best books for students of CS/IT/MCA for understanding the basic concept of simulation and modeling the real world system. In spite of this I have filled two patents jointly with Dr. B K Sarkar. One is accept finger print and display all the original documents of user. Second one is Smart Cooking System. It was great experience to author book and patents. Both things will be mile stone in the field of education.

Question:4- How do you tend to establish a relation with the students being the Head of Department? How do you make yourself available to them?

Answer: I am always available for my students. Whenever they need help I always provide it to them enthusiastically. I think that HoDs relationship with student should be cordial. HODs should be friendly with their students. My students share their opinion freely with me.

Question:5- What goals do you have in your mind for your college for the next few years?

Answer: My department is committed to provide intellectual, innovative and inspirational environment to produce technocrats, researchers, and bureaucrats through excellence in the field of education. I am proud to tell you that UG programme of CSE is NBA accredited up to 30- 06-2020. Our Institute NIET is NAAC Accredited with grade 'A'. NIET got 99th rank in year 2016. We are looking forward to get autonomous status; regarding this UGC team visited our Institute recently. We hope very soon we will get autonomous status. In next five year our future plan is of becoming deemed university.

Question:6- In the last few years, the education sector has moved more towards digital presence. How do you think it has impacted your institute and how has it impacted the student overall?

Answer: Digitalization is need of the hour. NIET has an ERP System. We already enter attendance and marks of students on ERP. We can retrieve the student details with one click. We have circulated all the notices through our ERP. We are going towards paper less system.

Question:7- What important skills according to you students must possess in today's environment?

Answer: In today's environment, students must possess skills such as people management skills, problem solving skills, cognitive skills, analytical skills, critical thinking skills, creativity & innovation skills, and business communication skills.

Question: 8 Any suggestions you would like to give to the current youth and the aspiring students?

Answer: My suggestion to current youth is that you should do what you love and love what you do. A person who works hard will surely gain anything he wants. Be a good human who helps everyone. Be a good partner, a good friend, a good soul who is honest, trustworthy and responsible. You are the person who can make our nation developed country. You have a big responsibility to make the nation better. I know you all can do this very well. Wish you all the best for your bright future.

NIET
Greater Noida
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GET FUTURE READY

NOIDA INSTITUTE OF ENGINEERING
& TECHNOLOGY, GREATER NOIDA

Some Brainstorming Quizzes

1- The term 'Computer' is derived from?

2- Junk e-mail is also called?

3- A computer cannot 'boot' if it does not have the?

4- IBM stands for?

5- Who is known as the Father of Internet?

6- Which computer engineer got Nobel Prize for literature in 2003?

7- The programming language used in Artificial Intelligence and expert system development is?

8- The server on the internet is also known as.

9- Who developed java programming language?

10- Which day is celebrated as World Computer Literacy Day?

1- Latin 2- Spam 3- Operating System 4- International Business Machines 5- Vint Cerf 6- J.M. Coetzee 7- Prolog 8- Host 9- James Gosling 10- 2nd December