

CompuTECH

8th Edition, 2022-23



DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING
GIRIJANANDA CHOWDHURY UNIVERSITY
Hathkhowapara, Azara, Guwahati - 17

CompuTECH

8th Edition, 2022-23

Published by
Department of Computer Science & Engineering
GCU, Guwahati - 781017

Editorial Board

Editor : Mrs. Mridusmita Baruah

Student editor : Subhranil Ghosh

Cover Page Design : Rishik Baishya

Vision and Mission of University

Vision

Girijananda Chowdhury University shall create a culture of education that will provide students a transformative experience – intellectual, ethical, cultural, and social. We envision a society where our students shall contribute with unparalleled professionalism, competence and integrity while upholding the basic human values of liberty, justice, and equality.

Mission

1. Girijananda Chowdhury University embarks upon its academic plan and programs with a mission of empowering our students with knowledge and skills in their chosen domain with a strong mooring in its envisioned values.
2. We have a mission to be contemporary in our pedagogy and to be future focused in developing courses and research trajectories considering the dynamic realities of the region, nation and the world at large.
3. Our mission is to equip our students with the requisite knowledge, skills and values in a unique ecosystem that will enable them to avail the opportunities coming in the wake of the industry 4.0. In this mission we strive for vibrant industry - academia bonding and excellence in research and innovation.
4. We have a mission of creating human resources critical for harnessing the unique and diverse natural resources of the northeast for a strong and vibrant economy necessary for sustainable development of the region.
5. Girijananda Chowdhury University's mission of creating citizens who will be globally competent and competitive with skills for communication, collaboration and cooperation is embedded in all its academic programs and research.
6. Our mission is to create a cultural continuum with our neighboring countries of Southeast Asia on the foundation of the commonalities of our tradition, culture, and common history.
7. Our mission is to enable our students to contribute towards a society that is heterogeneous, cosmopolitan, and egalitarian.

Vision and Mission of Department of Computer Science & Engineering

Vision

To develop competent computer science and engineering graduates who will contribute productively to local, national as well as global economies.

Mission

M1: To provide good quality education through state-of-the-art facilities and pedagogy in teaching.

M2: To motivate the students to develop research-based, societal projects through innovative solutions and to make them acquainted with the latest developments, traditions, and culture through seminars, workshops, expert talks, and industrial visits.

M3: To promote and nurture a conducive environment in the department so that the students ingrain professional values and ethical behavior to contribute towards a society that is heterogeneous, cosmopolitan, and egalitarian.

PROGRAM OUTCOMES(POs)

Engineering Graduates will be able to:

- **Engineering knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
- **Problem analysis:** Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
- **Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
- **Conduct investigations of complex problems:** Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
- **Modern tool usage:** Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.
- **The engineer and society:** Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
- **Environment and sustainability:** Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
- **Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
- **Individual and team work:** Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
- **Communication:** Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

- **Project management and finance:** Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
- **Life-long learning:** Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Program Specific Outcomes (PSO)

The Computer Science and Engineering graduates are able to

- **PSO1** : Analyze, design, develop, test and apply mathematics, science, engineering fundamentals and management principles to solve complex engineering problems.
- **PSO2** . : Develop their skills in the field of computer science and its latest trends for successful career, research, entrepreneurship and higher studies.
- **PSO3** : Apply ethical principles and commit to professional and social responsibilities.

Program Educational Objectives (PEOs)

PEO1 : Graduates will be able to apply the mathematical, scientific and engineering fundamentals to solve a wide range of computational problems in industry, government, or other work environments.

PEO2 : Graduates will be able to become entrepreneurs, employees of reputed organizations, pursue higher studies including research enhancing their skills in Computer Science and Engineering.

PEO3 : Graduates will be able to exhibit professional and ethical attitude, effective communication skills and teamwork for professional development in societal and environmental contexts.

Courses Offered

B.Tech in Computer Science & Engineering

M.Tech in Computer Science & Engineering

Ph.D in Computer Science & Engineering

Message from Dean, School of Engineering



The School of Engineering and Technology plays a crucial role in the education of emerging engineers and individuals with aspirations, fostering a shared ambition to create a positive impact in the world. The faculty of our school has a decade of experience in engineering education and has garnered a significant reputation as a highly sought-after educational institution among students in the surrounding area throughout the course of its existence. Our school has a comprehensive infrastructure, well-equipped laboratories, an extensive library, and a substantial faculty comprised of highly experienced individuals.

As an academic institution, our foremost objective is the continual enhancement of our endeavours. Our primary objective is to inculcate awareness and responsiveness towards the requirements of the community, while concurrently offering valuable contributions to the domains of education, knowledge, and society at large. Our primary objective is to assist students in cultivating the attributes of self-assurance, proficiency, and adaptability that are essential for achieving success in workplace and making meaningful contributions to society.

With best wishes,

Prof. S. Robert Ravi

Professor and Dean,
School of Engineering and Technology,
Girijananda Chowdhury University, Assam

Message from HOD



It gives me immense pleasure to present this edition of our departmental magazine, a vibrant reflection of the creativity, innovation, and technical prowess of our students and faculty. The subject of computer science and engineering is still developing quickly, and our department is dedicated to developing young people who are ready to lead, innovate, and explore in this digital age.

This magazine serves as a platform for our students to express their ideas, share their experiences, and showcase their achievements — both academic and extracurricular. It also highlights the tireless efforts of our faculty members who continuously strive to impart knowledge, mentor students, and foster an environment of holistic learning.

I extend my heartfelt appreciation to the editorial team, contributors, and all those who have worked behind the scenes to bring this issue to life. I am confident that “CompuTech” will inspire readers and stand as a testament to the collective spirit and excellence of the Department of Computer Science & Engineering.

Wishing you all success and innovation ahead.

Warm regards,

Dr. Minakshi Gogoi

Head of Department

Department of Computer Science & Engineering

Girijananda Chowdhury University, Assam

Editorial Message



With great joy and pride, I present to you the 8th edition of our technical magazine “CompuTech” from the Department of Computer Science and Engineering, Girijananda Choudhury University, Assam. This magazine is the outcome of the creativity, dedication, and hard work of our students, who have contributed despite the demands of classes, examinations, and assignments.

“CompuTech” reflects not only the technical knowledge of our students but also their imagination, aspirations, and innovative spirit. Through this platform, they have given shape to their thoughts and ideas, making this magazine both informative and inspiring.

I sincerely thank our management, Head of the Department Dr. Minakshi Gogoi, and all faculty and staff members for their continuous guidance and support. My special gratitude goes to Subhranil Ghosh, editor, student editorial board for his commitment in bringing this issue to life.

I hope you find this issue enriching and enjoyable.



Mrs. Mridusmita Baruah

Laboratory Instructor

Department of Computer Science & Engineering

Girijananda Choudhury University, Assam

From the Student Editorial Board



With immense pleasure, gratitude and love, I would like to present to you CompuTech 8th edition 2022-2023, the annual magazine of our Department of Computer Science and Engineering.

This is an unusual year, with a global crisis and pandemic going on. With all those negative and disturbing aura, our department is still successful in imparting quality education and knowledge. They not only bridged our learning gap but also tried to motivate and engage us in co-curricular activities so that we remain positive and hopeful amid this pandemic and depressing moments. As Martin Luther once said, "If you want to change the world, take up your pen and write". I am happy and honoured to be a part of the editorial team and very grateful that I have come across various skills and talents. So many different people, different thinking and different viewpoints made me realise how diverse we are and yet we are all one and in this together.

Subhranil Ghosh
8th Semester CSE

Table of Contents.

1. From Fantasy to Reality:The Rise of AR and VR in Today's World (Supreeti Phukan)	1
2. Safeguarding The Digital Realm: Unveiling The Importance of Cybersecurity (Prabal Pratim Barman)	4
3. AI and it's impact on the job market (Nitismita Das)	6
4. Ethical Hacking (Pallav Kashyap)	8
5. Is AI a threat to Humanity? (Prasurjya Goswami)	14
6. Blockchain Technology: Empowering Industries and Enabling Trust (Biraj Das)	15
7. The Beauty in Imperfection : Why Human Creativity Cannot Be Replicated by AI, Somethings that can't be replaced (Ankur J. Sarma)	17
8. Why are laptop prices increasing with the rise of advanced GPU chips? (Ritanjit Das)	19
9. Beyond Bitcoin: Exploring the Vast Potential of Blockchain Technology (Mrinmoy Pathak)	21
10. Pygame: Building Dynamic 2D Games with Python (Gaurav Kumar Das)	24
11. Use of CGI in Modern times (Saranga Das)	25
12. Embracing the Convenience of Electronic Payments (Sandilya Baruah)	26
13. Virtual reality: a glimpse of a different world (Dibashree Baruah)	28
14. Data Robbery: Safeguarding Your Information in an Era of Cyber Threats (Syed Sarfaraj AlSahi)	30
15. Li-Fi Technology (Sayantani Roy)	31

From Fantasy to Reality: The Rise of AR and VR in Today's World

Over the past few decades, technology has rapidly advanced, transforming the way we interact with the world. Two groundbreaking innovations that have gained immense attention and promise to revolutionize the human experience are augmented reality (AR) and virtual reality (VR). These immersive technologies have the potential to reshape various industries, from entertainment and gaming to education, healthcare, and beyond.

Augmented Reality: Enhancing the Real World

Augmented reality refers to the overlaying of digital information onto the real-world environment, creating a blended experience where virtual objects coexist with the physical world. The technology behind AR enables users to interact with virtual elements while maintaining a connection with reality through devices like smartphones, smart glasses, or headsets.

One of the most popular examples of AR is the mobile game Pokémon Go, where users can see and catch virtual Pokémon characters in their surroundings. However, AR extends far beyond gaming. It has significant implications in fields such as architecture and design, where professionals can visualize and manipulate virtual models in real-time, streamlining the design process.



Source: Internet

AR is also transforming retail and e-commerce by offering virtual try-on experiences for clothes, accessories, and even furniture. This technology allows customers to see how products would look or fit in their homes before making a purchase, enhancing the overall shopping experience.

Furthermore, AR holds enormous potential in education, as it can bring textbooks to life, enabling students to explore complex subjects through interactive 3D models and simulations.

Medical training is another area where AR is making strides, providing surgeons with real-time guidance during complex procedures, enhancing precision, and reducing the risk of errors.

Even AR can provide virtual guides, historical reconstructions, and interactive information at museums, historical sites, and tourist destinations, enriching visitors' experiences and knowledge.

Augmented Reality: Enhancing the Real World

Virtual reality takes users on a complete immersion journey, transporting them to simulated environments that can be entirely different from the physical world. VR relies on headsets and motion-tracking devices to create a sense of presence, tricking the human senses into believing they are present in the digital realm.



Source: Internet

The gaming industry has been at the forefront of VR adoption, offering players an unparalleled level of immersion and interactivity. With VR, users can explore richly detailed virtual worlds, engage in realistic simulations, and participate in multiplayer experiences, all from the comfort of their homes. The storytelling in VR is vast, enabling users to become active participants in their favorite movies or stories.

However, VR extends beyond gaming and entertainment. It has tremendous potential in training and simulation, allowing professionals to practice high-risk scenarios in a safe and controlled environment. This is particularly valuable in fields such as aviation, military training, and emergency response, where real-world training can be costly or dangerous.

VR is also emerging as a powerful tool for therapy and rehabilitation. By creating immersive environments, VR can help individuals overcome phobias, manage pain, and assist in physical and mental rehabilitation. Moreover, VR has the potential to enhance remote collaboration, enabling people from different parts of the world to work together in shared virtual spaces, fostering creativity and productivity.

Synergies and Future Possibilities

The potential of augmented reality and virtual reality is vast and transformative. These technologies are reshaping the way we perceive and interact with the world, blurring the boundaries between the physical and digital realms.

However, while AR and VR offer distinct experiences, their potential is not limited to separate domains. Combining both technologies can unlock even more possibilities. Mixed reality (MR) blends the real and virtual worlds, allowing users to interact with digital content while maintaining a connection with the physical environment. This fusion has applications in fields like architecture, engineering, and industrial design, where users can manipulate virtual objects in a real-world context.



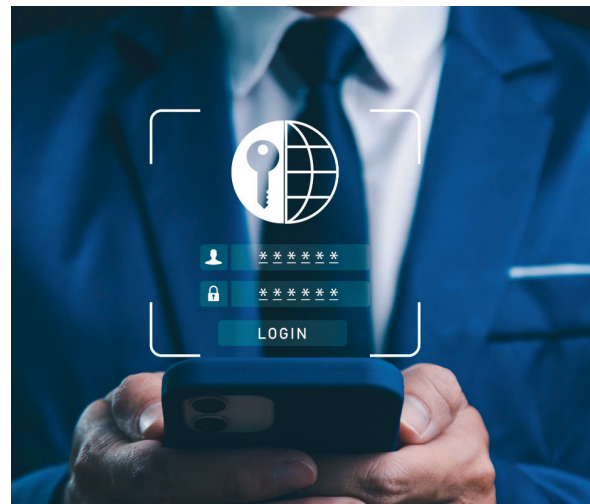
Source: Internet

 **Supreeti Phukan**
B.Tech CSE, 2nd Sem

Safeguarding The Digital Realm: Unveiling The Importance of Cybersecurity

In an increasingly interconnected world, where technology permeates every aspect of our lives, the need for robust cybersecurity measures has never been more crucial. As engineering students, it is imperative to understand the significance of cybersecurity and its relevance in the digital age.

Cyber threats have evolved exponentially over the years, surpassing traditional security mechanisms and challenging our digital resilience. From computer viruses and worms to sophisticated hacking techniques and ransomware attacks, cybercriminals continuously exploit vulnerabilities to gain unauthorized access to systems, steal sensitive data, and disrupt critical infrastructures. Understanding the evolving nature of cyber threats is crucial for engineers to devise effective defense mechanisms.



Source: Internet

Cybersecurity encompasses a broad spectrum of practices and technologies aimed at protecting digital systems, networks and data from unauthorized access or damage. It revolves around four fundamental pillars: confidentiality, integrity, availability, and authenticity. Ensuring data remains accessible only to authorized individuals, safeguarding its accuracy and trustworthiness, ensuring its availability when needed, and verifying the identity of individuals or systems are all critical components of a robust cybersecurity framework.

Within the realm of engineering, cybersecurity plays a vital role in fortifying digital defenses. By integrating security considerations into the design and development of software, hardware and systems, engineers can mitigate vulnerabilities from the ground up. Understanding secure coding practices, network protocols, encryption algorithms and system architectures equips engineers with the necessary skills to build resilient systems that withstand malicious attacks.

Ethical hacking or penetration testing is an essential aspect of cybersecurity. Ethical hackers simulate real-world cyber attacks to identify vulnerabilities within systems, networks or applications. By conducting comprehensive assessments engineers can proactively address weaknesses, strengthen defenses and enhance overall security posture.

While technology plays a significant role in cybersecurity, the human element cannot be overlooked. Social engineering attacks, such as phishing, rely on human vulnerabilities to deceive individuals into revealing sensitive information. Raising awareness among students, faculty, and staff about cybersecurity best practices such as strong passwords, two-factor authentication and recognizing phishing attempts is crucial in creating a security-conscious culture.

The cybersecurity landscape is continually evolving with emerging technologies introducing new challenges. The advent of the Internet of Things(IoT), Artificial Intelligence(AI) and Cloud Computing expands the attack surface and necessitates innovative security solutions. Engineers must stay abreast of the latest trends and challenges such as securing interconnected devices and protecting sensitive data in the cloud to effectively combat evolving cyber threats.

As future engineers it is our responsibility to recognize the significance of cybersecurity and its impact on society. By understanding the evolving nature of cyber threats, embracing secure design principles and staying informed about emerging trends we can contribute to building a safer digital landscape. Let us harness our engineering skills to fortify our systems, protect sensitive data and ensure the trust and integrity of the digital realm we inhabit. Together we can shape a secure future for all.

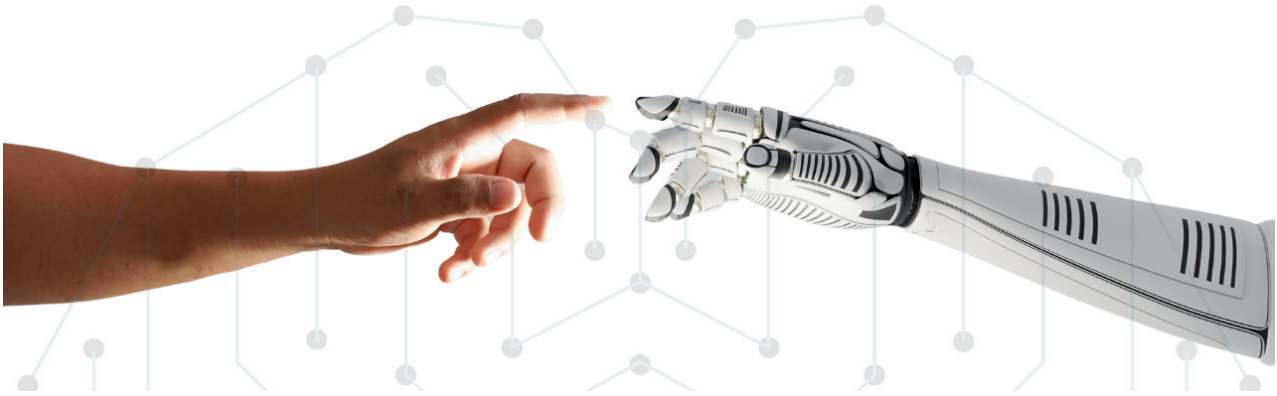


Source: Internet



Prabal Pratim Barman
B.Tech CSE,4th Sem

AI and its impact on the job market



Artificial Intelligence (AI) refers to the development and deployment of computer systems that can perform tasks that typically require human intelligence. AI aims to simulate human intelligence by enabling machines to perceive, reason, learn, and make decisions in a manner similar to humans.

AI encompasses various subfields and techniques, including: Machine Learning (ML), Deep Learning, Natural Language Processing (NLP), Computer Vision, Robotics, Reinforcement Learning, Expert Systems etc.

Artificial Intelligence (AI) has been transforming various aspects of the job market, creating both opportunities and challenges. Here are some key points to consider regarding AI and its impact on the job market:

- 1. Automation of routine tasks:** AI technologies, such as machine learning and robotic process automation, can automate repetitive and mundane tasks, leading to increased efficiency and productivity. This automation can affect jobs that involve predictable and rule-based activities, such as data entry, assembly line work, or customer service. However, it also frees up human workers to focus on more complex and creative tasks.
- 2. Job displacement and transformation:** The automation of certain tasks can lead to the displacement of jobs. However, historically, technological advancements have also created new job opportunities. AI is expected to create new roles that complement and collaborate with intelligent systems. Jobs that involve creativity, critical thinking, complex problem-solving, and emotional intelligence are less likely to be fully automated.

3. New job opportunities: AI has the potential to create new job roles that require skills in developing, implementing, and maintaining AI systems. These include AI engineers, data scientists, machine learning specialists, and AI ethicists. Additionally, the increasing adoption of AI in industries such as healthcare, finance, manufacturing, and transportation can generate job opportunities in those sectors.

4. Skill requirements: As AI becomes more prevalent, there is a growing demand for workers with skills in AI and related fields. It is crucial for individuals to develop a strong foundation in STEM (science, technology, engineering, and mathematics) subjects, data analysis, programming, and machine learning. Additionally, skills such as creativity, critical thinking, adaptability, and emotional intelligence will remain valuable.

5. Reskilling and upskilling: With the changing job landscape, reskilling and upskilling become essential for individuals to remain employable. Lifelong learning and continuous skill development will be crucial to adapt to the evolving demands of the job market. Governments, educational institutions, and organizations should invest in providing training programs to help individuals transition into AI-related roles.

6. Ethical considerations: The rise of AI raises ethical concerns related to job displacement, bias in algorithms, privacy, and security. Addressing these concerns requires collaboration between policymakers, industry leaders, and researchers to develop guidelines, regulations, and ethical frameworks that ensure responsible AI deployment.

In summary, while AI has the potential to impact certain job roles, it also opens up new opportunities and demands a shift in skill requirements. Adapting to this changing landscape will require a combination of reskilling, upskilling, and ongoing learning to thrive in the AI-driven job market.



Nitismita Das
B.Tech CSE, 6th Sem

Ethical Hacking

Ethical hacking involves an authorized attempt to gain unauthorized access to a computer system, application, or data. Carrying out an ethical hack involves duplicating strategies and actions of malicious attackers. This practice helps to identify security vulnerabilities which can then be resolved before a malicious attacker has the opportunity to exploit them.

Working

Hackers are highly skilled in breaching securities to gain unauthorized access to phones, tablets, computers, IoT devices, networks, or the networking system of an entire organization. They are generally very proficient in exploiting weaknesses in network security, taking advantage of the same. These weaknesses can be technical or social in nature.

- **Technical weaknesses:** Hackers are extremely talented in exploiting software vulnerabilities or weak security practices. They do this to gain unauthorized access or even sometimes to inject malware that would crumple the entire system.
- **Social weaknesses:** This kind of social engineering is done to convince those with privileged access to click on malicious links, open infected files, or reveal personal information. This allows them access to otherwise hardened infrastructures.

Who is a hacker

A hacker is ideally a person who is skilled in information technology. He uses his technical knowledge to overcome an obstacle or sometimes even achieve a goal within a computerized system. However, in recent times, the term hacker is always associated with a security hacker – someone who is always on the lookout for ways to acquire and exploit sensitive personal, financial and organizational information, which is otherwise not accessible to them. Legitimate figures often use hacking for legal purposes.

Types of Hackers

Computers and the Internet have changed the work environment of the world beyond imagination. Computers are taking over a major part of our lives, all our data has got transferred from records and ledgers to computers. Though this kind of shift in working has reduced the physical burden on workers it has also increased the chances of data theft. People involved in stealing data or harming the systems are knowledgeable people with wrong intentions known as Hackers. There are different types of hackers.

Let's take a look at how many types of hackers are there and the types of hacker attacks and techniques.

1. White-Hat Hackers
2. Black-Hat Hackers
3. Gray-Hat Hackers
4. Script-Kiddies
5. Green-Hat Hackers
6. Blue-Hat Hackers
7. Red-Hat Hackers
8. State/Nation Sponsored Hackers
9. Hacktivist
10. Malicious insider or Whistleblower

White-Hat Hackers

White hat hackers are types of hackers who're professionals with expertise in cybersecurity. They are authorized or certified to hack the systems. These White Hat Hackers work for governments or organizations by getting into the system. They hack the system from the loopholes in the cybersecurity of the organization. This hacking is done to test the level of cybersecurity in their organization. By doing so, they identify the weak points and fix them to avoid attacks from external sources. White hat hackers work per the rules and regulations the government sets. White hat hackers are also known as ethical hackers.

Motives & Aims: The goals of these types of hackers are helping businesses and an appetite for detecting gaps in networks' security. They aim to protect and assist companies in the ongoing battle against cyber threats. A White Hat hacker is any individual who will help protect the company from raising cybercrimes. They help enterprises create defences, detect vulnerabilities, and solve them before other cybercriminals can find them.

Black-Hat Hackers

Black hat hackers are also knowledgeable computer experts but with the wrong intention. They attack other systems to get access to systems where they do not have authorized entry. On gaining entry they might steal the data or destroy the system. The hacking practices these types of hackers use depend on the individual's hacking capacity and knowledge. As the intentions of the hacker make the hacker a criminal. The malicious action intent of the individual cannot be gauged either can the extent of the breach while hacking

Motives & Aims: To hack into organizations' networks and steal bank data, funds or sensitive information. Normally, they use the stolen resources to profit themselves, sell them on the black market or harass their target company.

Gray-Hat Hackers

The intention behind the hacking is considered while categorizing the hacker. The Gray hat hacker falls between the black and white hat hackers. They are not certified, hackers. These types of hackers work with either good or bad intentions. The hacking might be for their gain. The intention behind hacking decides the type of hacker. If the intention is for personal gain, the hacker is considered a gray-hat hacker.

Motives & Aims: The difference is, they don't want to rob people nor want to help people in particular. Rather, they enjoy experimenting with systems to find loopholes, crack defences, and generally find a fun hacking experience.

Script-Kiddies

It is a known fact that half knowledge is always dangerous. The Script Kiddies are amateur's types of hackers in the field of hacking. They try to hack the system with scripts from other fellow hackers. They try to hack the systems, networks, or websites. The intention behind the hacking is just to get the attention of their peers. Script Kiddies are juveniles who do not have complete knowledge of the hacking process.

Motives & Aims: One standard Kiddie Script attack is a DoS (Denial of Service) or DDoS attack (Distributed Denial of Service). This simply means that an IP address is flooded with too much excessive traffic that it collapses. Consider several Black Friday shopping websites, for instance. It creates confusion and prevents someone else uses the service.

Green-Hat Hackers

Green hat hackers are types of hackers who learn the ropes of hacking. They are slightly different from the Script Kiddies due to their intention. The intent is to strive and learn to become full-fledged hackers. They are looking for opportunities to learn from experienced hackers.

Blue-Hat Hackers

Blue Hat Hackers are types of hackers who're similar to Script Kiddies. The intent to learn is missing. They use hacking as a weapon to gain popularity among their fellow beings. They use hacking to settle scores with their adversaries. Blue Hat Hackers are dangerous due to the intent behind the hacking rather than their knowledge.

Red-Hat Hackers

Red Hat Hackers are synonymous with Eagle-Eyed Hackers. They are the types of hackers who're similar to white hackers. The red hat hackers intend to stop the attack of black hat hackers. The difference between red hat hackers and white hat hackers is that the process of hacking through intention remains the same. Red hat hackers are quite ruthless when dealing with black hat hackers or counteracting malware.

The red hat hackers continue to attack and may end up having to replace the entire system setup.

State/Nation Sponsored Hackers

Government appoints hackers to gain information about other countries. These types of hackers are known as State/Nation sponsored hackers. They use their knowledge to gain confidential information from other countries to be well prepared for any upcoming danger to their country. The sensitive information aids in being on top of every situation but also in avoiding upcoming danger. They report only to their governments.

Hacktivist

These types of hackers intend to hack government websites. They pose themselves as activists, so known as a hacktivist. Hacktivists can be an individual or a bunch of nameless hackers whose intent is to gain access to government websites and networks. The data gained from government files accessed are used for personal political or social gain.

Malicious insider or Whistleblower

These types of hackers include individuals working in an organization who can expose confidential information. The intent behind the exposure might be a personal grudge against the organization, or the individual might have come across illegal activities within the organization. The reason for exposure defines the intent behind the exposure. These individuals are known as whistleblowers.

[**Note:** First 7 types of hackers broadly referred to in the cybersecurity world. The three types of hackers listed below work in different capacities.]

How are Ethical hackers different than malicious hackers?

- Ethical hackers use their knowledge to secure and improve the technology of organizations. They provide an essential service to these organizations by looking for vulnerabilities that can lead to a security breach.
- An ethical hacker reports the identified vulnerabilities to the organization. Additionally, they provide remediation advice. In many cases, with the organization's consent, the ethical hacker performs a re-test to ensure the vulnerabilities are fully resolved.
- Malicious hackers intend to gain unauthorized access to a resource (the more sensitive the better) for financial gain or personal recognition. Some malicious hackers deface websites or crash backend servers for fun, reputation damage, or to cause financial loss. The methods used and vulnerabilities found remain unreported. They aren't concerned with improving the organizations security posture.

What skills and certifications should an ethical hacker obtain

An ethical hacker should have a wide range of computer skills. They often specialize, becoming subject matter experts (SME) on a particular area within the ethical hacking domain.

All ethical hackers should have:

- Expertise in scripting languages.
- Proficiency in operating systems.
- A thorough knowledge of networking.
- A solid foundation in the principles of information security.

Some of the most well-known and acquired certifications include:

- EC Council: Certified Ethical Hacking Certification
- Offensive Security Certified Professional (OSCP) Certification
- CompTIA Security+
- Cisco's CCNA Security
- SANS GIAC

What skills and certifications should an ethical hacker obtain

White hat hackers, especially those performing external penetration tests (pen tests), use the same hacking techniques and tools as black hat hackers. But white hat hackers do so with the intent of helping an organization improve its security posture. Common examples include the following:

Pen testing. Ethical hackers use their skills to help identify potential entry points and system vulnerabilities and then try to penetrate the organization's network or exposed system.

Email phishing. White hat hackers conduct legitimate anti-phishing campaigns to find and fix possible issues within an organization's network before an attack can occur. Email phishing tricks the recipient of the email into providing sensitive information or clicking on a malicious file or link.

Denial-of-service (DoS) attack. This type of attack temporarily disrupts or degrades the performance of a machine or network resource, making it unavailable to users. A white hat hacker can simulate this type of attack to help an organization develop its DoS response plan.

Social engineering. White hat hackers use behavioural techniques to test the security level of a company's systems so it can prevent an attack. Social engineering attacks take advantage of human nature and trust in order to trick employees into breaking security protocols or giving away sensitive information.

Security scanning. Ethical hackers use a variety of tools to automate the process of finding known vulnerabilities. These range from tools to detect web application vulnerabilities, such as Acunetix or Netsparker, to open-source pen testing tools, including Metasploit Framework or Nikto.

What problems does hacking identify

While assessing the security of an organization's IT asset(s), ethical hacking aims to mimic an attacker. In doing so, they look for attack vectors against the target. The initial goal is to perform reconnaissance, gaining as much information as possible.

Once the ethical hacker gathers enough information, they use it to look for vulnerabilities against the asset. They perform this assessment with a combination of automated and manual testing. Even sophisticated systems may have complex countermeasure technologies which may be vulnerable.

They don't stop at uncovering vulnerabilities. Ethical hackers use exploits against the vulnerabilities to prove how a malicious attacker could exploit it.

Some of the most common vulnerabilities discovered by ethical hackers include:

- Injection attacks
- Broken authentication
- Security misconfigurations
- Use of components with known vulnerabilities
- Sensitive data exposure

After the testing period, ethical hackers prepare a detailed report. This documentation includes steps to compromise the discovered vulnerabilities and steps to patch or mitigate them.

What problems does hacking identify

- **Limited scope.** Ethical hackers cannot progress beyond a defined scope to make an attack successful. However, it's not unreasonable to discuss out of scope attack potential with the organization.
- **Resource constraints.** Malicious hackers don't have time constraints that ethical hackers often face. Computing power and budget are additional constraints of ethical hackers.
- **Restricted methods.** Some organizations ask experts to avoid test cases that lead the servers to crash (e.g., Denial of Service (DoS) attacks)

Conclusion

Information is widely available over the internet. Keen individuals can learn and adapt to them immediately. The intent behind hacking is what sets the hackers apart. The knowledge is used for harming individuals or governments or for personal gain, which makes hackers dangerous. The types of hacker attacks vary from organization to organization. The intensity and type of attack are dependent on the hackers' ability to find the loophole and penetrate the security system. This has put up a huge challenge to organizations and governments to be updated with their cybersecurity at all times.



Pallav Kashyap
B.Tech CSE, 8th Sem

Is AI a threat to Humanity?

Artificial Intelligence has become a huge controversy between scientists within the past few years. The goal of AI is to simplify life and improve the performance of just about everything around us. But many have asked themselves will artificial intelligence improve our communities in the ways we humans can't, or will they just cause danger to us?

Even Stephen Hawking predicted the worst in 2014: "I think the development of complete artificial intelligence could end humanity" The threat would be very serious. According to a study published by Oxford's University in May 2017, there is a 50% chance that artificial intelligence will outpace humans for just about any task in 34 years. I personally believe that AI can improve the performance of human beings but also can cause danger. Some of the reasons why artificial intelligence can cause danger are like risks to employment.

Computers are becoming more intelligent and they could go beyond human intelligence. Some even imagine AI to replace human in intellectual activities. Another problem is the risk of reinforcing cybercrime but also leading to the use of drones or robots for terrorist purposes. Experts point out that terrorists could modify commercially available AI systems like drones, autonomous vehicles to cause crashes, collisions or explosions.

Moreover, 'Cybercrime' is already rising and is likely to be reinforced with the tools provided by AI. With AI, it should be possible to make very realistic fake videos, and this could be used to question politicians, warns the report. If AI allows these threats to become stronger, more difficult to spot and attribute, this could pose big problems of political stability and perhaps help trigger.

However, reducing artificial intelligence to these threats would be a mistake. Because the AI already brings many solutions to the man. AI can recover and analyze a huge amount of data and diagnose and cure diseases or prevent climate risks much better. So, the AI: danger or luck? In my opinion, it is a little bit of the two, as long as there is a balance between the improvements allowed by technical progress and the regulations needed to protect citizens.



Prasurjya Goswami
B.Tech CSE, 6th Sem

Blockchain Technology: Empowering Industries and Enabling Trust

Introduction

Blockchain technology has emerged as a disruptive force, revolutionizing industries across the globe. With its decentralized and immutable nature, blockchain offers a transformative solution to long-standing challenges in trust, transparency, and security. In this article, we delve into the multifaceted role of blockchain technology, exploring its underlying principles and the profound impact it has on various sectors. From finance to supply chain management, blockchain is reshaping industries, empowering individuals, and ushering in a new era of trust and efficiency.

Understanding Blockchain Technology:

At its core, blockchain is a distributed ledger technology that enables the secure recording and verification of transactions across a network of computers. By eliminating the need for intermediaries, blockchain empowers participants to engage in direct peer-to-peer transactions, enhancing security and reducing reliance on central authorities. Transactions are bundled into blocks, forming an unalterable chain of information, with each block referencing the previous one. This design ensures the integrity and immutability of the data recorded on the blockchain.

Enhancing Trust and Transparency:

One of the fundamental strengths of blockchain lies in its ability to enhance trust and transparency. By eliminating intermediaries, such as banks or clearinghouses, blockchain enables direct, verifiable transactions between parties. The decentralized and transparent nature of the technology reduces the risk of fraud and manipulation, fostering a higher level of trust among participants. In the realm of finance, blockchain has the potential to streamline processes, improve auditability, and reduce costs associated with intermediaries, thus enhancing efficiency and trust in financial transactions.

Transforming Supply Chain Management:

Blockchain is revolutionizing supply chain management by introducing unprecedented levels of transparency and traceability. Through the secure recording of transactions, blockchain creates an immutable and auditable record of the movement of goods and

services. Stakeholders can easily trace the origin, provenance, and authenticity of products, reducing the risks of counterfeiting and ensuring quality control. Additionally, blockchain facilitates efficient collaboration among supply chain participants, leading to streamlined processes, cost reductions, and improved customer satisfaction.

Empowering Digital Identity and Security:

The decentralized nature of blockchain offers a promising solution to the challenges of digital identity and security. Unlike traditional systems where personal information is vulnerable to breaches, blockchain enables individuals to have greater control over their digital identities. Through encrypted and self-sovereign identities, users can selectively disclose information while maintaining their privacy. This empowerment fosters trusted interactions across various platforms, protecting individuals' data and reducing the risks associated with identity theft and fraud.

Unlocking Financial Inclusion:

Blockchain technology has the potential to unlock financial inclusion for the unbanked and underbanked populations worldwide. By leveraging blockchain's decentralized infrastructure, financial services can be provided without relying on traditional banking systems. Through accessible digital wallets on mobile devices, individuals can securely store, send, and receive funds, as well as access other financial services. Blockchain-enabled solutions facilitate low-cost cross-border transactions, reducing remittance costs and providing financial access to marginalized communities.

Conclusion:

Blockchain technology is driving a paradigm shift in multiple industries, empowering trust, and enabling new possibilities. Its decentralized, transparent, and secure nature is transforming finance, supply chain management, digital identity, and fostering financial inclusion. As blockchain continues to evolve and gain wider adoption, it holds immense potential to create a more efficient, transparent, and inclusive global ecosystem. Embracing blockchain's transformative power will pave the way for a future where trust and efficiency are at the forefront of our digital interactions.



Biraj Das
B.Tech CSE,4th Sem

The Beauty in Imperfection: Why Human Creativity Cannot Be Replicated by AI, Somethings that can't be replace

Human creativity is an expression of our experiences and emotions. It is a way to communicate and connect with others on a deeper level. Art, music, and literature are mediums through which we can share our thoughts, feelings, and perspectives with the world. Human creativity is not just about the final product, but also about the journey of creation. The process of creating something is just as important as the result because it reflects the artist's emotions and experiences.

One of the significant advantages of human creativity is its imperfections. It is the small nuances and idiosyncrasies that come with human creation that make it relatable and emotionally resonant. These imperfections are what make it human and connect us to it on a deeper level. It is not just about the technical skill or proficiency but also about the emotional connection that comes from the creative process.

AI technology, on the other hand, lacks the emotional depth that is inherent in human creativity. It may be able to analyze data and create a formula for what makes a popular song or a compelling story, but it cannot replicate the passion and soul that comes from a human creator. It cannot understand the human experience, nor can it empathize with it. As a result, AI-generated works may lack the emotional connection that is vital to human creativity.

Furthermore, AI technology may also be limited by its programming and training data. While it can learn from existing data and replicate patterns, it may struggle with creating something truly original and unique. Human creativity, on the other hand, is not limited by programming or training data. It is a reflection of the individual's experiences, thoughts, and emotions.

In conclusion, while AI technology has made significant strides in replicating human creativity, it is still limited in its emotional depth and human touch. Human creativity is a

reflection of our experiences and emotions, and it is this emotional connection that sets it apart from AI-generated works. While AI may be able to replicate certain elements of creativity, it cannot replace the human experience. The emotional connection that comes with human creativity is something that is unique and irreplaceable, and it is this connection that will always set human creativity apart from AI technology.

We should enthusiastically embrace the advancements in technology, but we must never overlook the vital role of human creativity. As impressive as these new technologies are, they can never fully replace the ingenuity and imagination that come from the human mind.

Therefore, we must strive to integrate these technologies into our creative processes while also nurturing and fostering our innate human creativity.



Ankur Jyoti Sarma
B.Tech CSE, 4th Sem

Why are laptop prices increasing with the rise of advanced GPU chips?

The latest scoop on GPU prices paints a pretty grim picture. It appears that the average prices of graphics cards have doubled between 2020 and 2023, and they show no signs of stopping.

We all knew that GPUs are on the expensive side, but did anyone really expect that the prices would skyrocket so much? More importantly, when will it end?

If you want to own one of the best graphics cards from the latest generation or two, you have to be prepared to pay a pretty penny. While there are still plenty of RTX 30-series and RDNA 2 cards in stock, their prices are fairly steady. Meanwhile, the current generation is expensive across the board and not dropping in price so far. The only exception could be Nvidia's RTX 4080, which might receive a price cut due to disappointing sales.

GPU laptops are expensive for a variety of reasons. One reason is that they are designed specifically for gaming, with high-performing components and specialized cooling systems.

Additionally, many these laptops include advanced features such as high-resolution displays and customizable keyboards. Additionally, the manufacturers of such laptops have to pay a premium for the latest and most powerful GPUs, which contributes to the overall cost of the product. GPU laptops can last years, running at 100%. Furthermore, the demand for these laptops remains high, which allows manufacturers to charge more for them.

The lack of competition in the early 2010s, especially from AMD, has been one of the driving factors behind the ever-increasing GPU prices. When NVIDIA launched the Pascal-based GeForce 10-series graphics cards in 2016, the company followed an aggressive pricing strategy as it was already facing heat from AMD with its RX 300 series of GPUs. Two years later, NVIDIA launched the Ampere-based RTX 30-series of graphics cards, with the RTX 3090Ti sitting right at the top for a whopping \$2000 in 2022. Although AMD has started competing again in the high-end GPU market this time around with its Radeon RX 6000 graphics cards, NVIDIA still holds the performance crown.

We are currently amid a global chip shortage that could continue indefinitely. We use semiconductor chips in everything, from computers to airplanes; manufacturers from all around the world have had to scale back or limit their production due to the shortage. Chip shortage has impacted not just graphics cards but other sectors as well, including laptops, phones, and video game consoles.

We get that the COVID-19 global pandemic is old news, but you can't deny the fact that it has drastically changed how people and businesses choose to work. More people have started to work from home, which has resulted in an increased demand for personal electronics. GPU prices are high right now because the market is hungrier for them than ever. This has drastically increased the demand for graphics cards, which is why graphics cards are so expensive.

Another consequence of the pandemic is broken supply chains. While COVID-19 is no longer the prime reason for this, other factors such as the Russia-Ukraine war have disrupted global supply chains in 2022. Long story short: this is why graphic cards are so expensive. There are fewer GPUs floating around than people with the means, the need, and the cash to buy them, and it's partially COVID's fault. The growth in prices is unlikely to abate soon as the supply chain will take more time to recover from the last two years of disruption.

Cryptocurrency Miners need a good graphics card and software to mine cryptocurrencies such as Ethereum efficiently. They often have high requirements for what kind of graphics cards they need for their set-ups; the faster the card, the faster they can mine, so higher-end cards are more desirable.

This article has listed all the reasons why graphics cards are so expensive, but unfortunately, GPU prices are not within our direct control. As long as the demand remains higher than the supply, graphics cards will continue to be expensive.

With inflation factored in, you should no longer expect high-end graphics cards with sub-\$500 price tags as you did five or six years ago. Times have changed, and technology continues to move forward to deliver new and better experiences to the consumer—for a price, of course!



Ritanjit Das
B.Tech CSE, 2nd Sem

Beyond Bitcoin: Exploring the Vast Potential of Blockchain Technology

Blockchain technology has emerged as a revolutionary concept with far-reaching implications across various industries. Initially recognized for its association with cryptocurrencies like Bitcoin, blockchain has evolved into a versatile technology that offers decentralized and transparent systems for secure data storage, transactions, and more. In this article, we will explore the fundamentals of blockchain technology and its potential applications beyond finance.

Unlocking Financial Inclusion:

At its core, blockchain is a distributed ledger that records transactions or data across multiple computers, known as nodes. Each transaction is bundled into a "block" and added to a chain of previous blocks, creating an immutable and chronological record. This decentralized nature eliminates the need for intermediaries, such as banks or governments, as the entire network collectively verifies and maintains the integrity of the data.

Let's delve deeper into some of the key aspects and potential applications of blockchain technology.

1. Decentralization and Transparency:

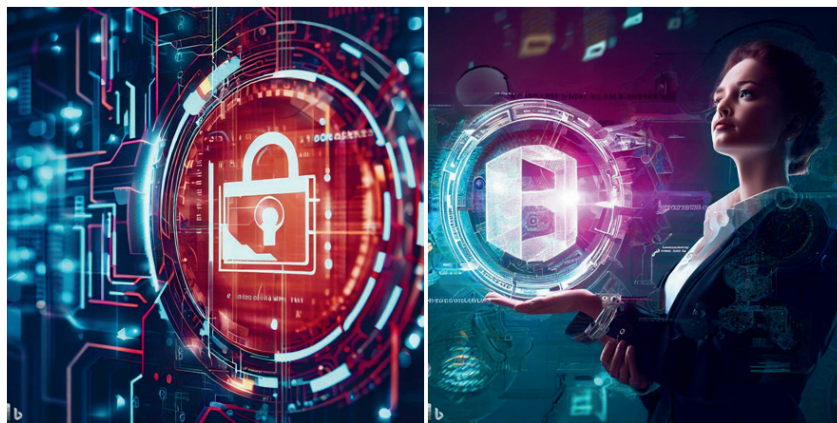
Blockchain's decentralized nature eliminates the need for a central authority or intermediary to validate and verify transactions. Instead, it relies on a network of nodes that collectively maintain and validate the blockchain. This decentralization ensures that no single entity has control or ownership over the data, enhancing transparency and reducing the risk of fraud or manipulation.



The transparency of blockchain comes from its public nature, where all participants have access to the same information. Transactions recorded on the blockchain are visible to all network participants, creating an auditable and trustworthy system. This transparency enhances trust between parties, making blockchain suitable for applications that require secure and transparent record-keeping.

2. Enhanced Security:

Blockchain employs cryptographic techniques to secure the data stored within each block. Each block contains a unique cryptographic hash that is generated based on the data it contains and references the previous block's hash. This design ensures the integrity of the data by creating a chain that makes it extremely difficult for any unauthorized modifications to go unnoticed. Altering the data in one block would require recalculating the hash for that block and all subsequent blocks, which is computationally intensive and practically infeasible.



Moreover, blockchain's distributed nature adds an extra layer of security. Instead of relying on a single centralized database that can be vulnerable to hacking or data breaches, blockchain stores data across multiple nodes in the network. To compromise the system, an attacker would need to gain control over a majority of the network's nodes, which is highly unlikely in a well-established blockchain network.

3. Immutable and Auditable:

Once data is recorded on the blockchain, it becomes practically immutable, meaning it cannot be altered or deleted without the consensus of the network. This immutability makes blockchain an ideal solution for applications where data integrity is crucial, such as supply chain management, provenance tracking, and legal documentation.

The immutability of blockchain data also enables easy auditing and verification. Auditors and regulators can independently verify the integrity and authenticity of transactions by examining the blockchain's history. This feature can streamline auditing processes, reduce the need for intermediaries, and enhance trust in various industries.

4. Applications of Blockchain Technology:

- **Supply Chain Management:** Blockchain can revolutionize supply chain management by providing a transparent and tamper-proof record of the movement and

origin of goods. Each transaction, from production to distribution, can be recorded on the blockchain, ensuring authenticity, preventing counterfeiting, and improving accountability throughout the supply chain.

- **Healthcare:** Blockchain has the potential to transform healthcare by enabling secure and interoperable sharing of medical records. Patient data can be stored on the blockchain, accessible to authorized healthcare providers, ensuring accuracy, privacy, and data integrity. Blockchain can also facilitate the sharing of research data, streamline clinical trials, and enhance data security in healthcare systems.
- **Identity Verification:** Blockchain offers a decentralized and secure solution for identity management. Instead of relying on centralized databases prone to breaches, individuals can have control over their identities through cryptographic keys stored on the blockchain. This can simplify identity verification processes, prevent identity theft, and enable secure access to services and systems without compromising privacy.
- **Smart Contracts:** Blockchain enables the execution of smart contracts, which are self-executing and self-enforcing agreements written in code. Smart contracts automatically execute predefined actions when specific conditions are met. They eliminate the need for intermediaries, reduce costs, and enhance efficiency in areas such as real estate transactions, insurance claims, and supply chain management.
- **Financial Services:** Blockchain has disrupted the financial industry through cryptocurrencies and decentralized finance (DeFi) applications. It enables fast and secure cross-border transactions, eliminates intermediaries in remittance processes, and provides financial inclusion to the unbanked. Blockchain-based platforms also allow for decentralized lending, borrowing, and trading, creating new avenues for peer-to-peer financial services.

Conclusion

Blockchain technology offers a paradigm shift in data management, transaction verification, and trust-building. Its decentralized and transparent nature enhances security, ensures data integrity, and reduces reliance on intermediaries. The potential applications of blockchain extend far beyond finance and cryptocurrencies, with supply chain management, healthcare, identity verification, and smart contracts being just a few examples.

While blockchain technology has immense potential, challenges such as scalability, interoperability, regulatory frameworks, and energy consumption need to be addressed for widespread adoption. Nonetheless, as blockchain continues to evolve and innovative solutions emerge, it will likely reshape industries, improve efficiency, and empower individuals and businesses in the years to come.



Mrinmoy Pathak
B.Tech CSE,4th Sem

Pygame: Building Dynamic 2D Games with Python

Introduction:

Pygame is a powerful Python library for developing 2D games. With its extensive features and simplicity, it allows developers to create interactive and visually appealing games. In this article, let us explore the basics of Pygame and provide a step-by-step guide to get started.

1. Getting Started with Pygame

Install Pygame using `pip install pygame` and set up your development environment. Import the Pygame library to access its functionalities.

2. Key Concepts in Pygame

Understand crucial Pygame concepts:

- **Game Window and Display:** Create and manage the game window using `pygame.display()`.
- **Sprites and Game Objects:** Use `pygame.sprite()` to handle game objects and collisions.
- **Game Loop:** Control the game flow with a loop that updates the game state, handles input, and renders graphics.
- **User Input Handling:** Capture keyboard, mouse, and joystick events with Pygame's functions.
- **Graphics and Animation:** Render graphics, images, and animations using Pygame's graphics modules.

3. Building Your First Pygame Game:

Initialize Pygame, create game objects, handle user input, implement the game loop, and utilize collision detection and game logic. Add audio effects with Pygame's sound module.

Conclusion:

Pygame provides a versatile framework for developing 2D games in Python. By mastering its features and concepts, we can unleash our creativity and embark on an exciting journey into game development.



Gaurav Kumar
B.Tech CSE, 6th Sem

Use of CGI in Modern times

CGI as we know it, stands for Computer Generated Imagery in various aspects of modern media, which includes Video games, TV shows and most notably, movies. Almost every big movie to have come out in the last 5 years which includes the likes of Avengers : Infinity War, Avengers :Endgame, Top Gun Maverick , Spiderman No way Home, and almost every other superhero movie and tv show for that matter are CGI heavy creations.

In fact , according to a report by Hollywood insider, roughly 5 Billion USD have been spent in CGI since 2009's Avatar (also the highest grossing movie of all time)

Use of CGI has also found its way heavily into TV shows.

If we take into example two big budget ongoing projects – The House of the Dragon and The Rings of Power, both are CGI heavy juggernauts that uses CGI for animating most of their backgrounds, locations and even most of their characters.

The best example of an entirely CGI made character is Thanos from Marvel Cinematic Universe as well as the Incredible Hulk . Both of these characters are entirely CGI heavy. Another notable use of CGI comes from the astonishing fact that our very own princess Leia actress Carrie Fisher died in 2016. But her death didn't prevent the character to be brought back into the movies of Star wars releasing in 2016 and 2019 respectively. 2019 's Rise of Skywalker used her voice from her previous projects and used CGI to bring her back into the big screen for one last movie.

So by the above examples we can see why CGI is so favoured.

For one, CGI lets people use locations in their movies that aren't accessible to human beings. Like Volcanoes, other planets , etc

CGI helps us create intimidating characters like Thanos. Use of CGI makes the potential for creativity endless for the creators. Star Wars engulfed everyone into their universe , way back in 1974. And it wouldn't have been possible if people weren't enamored by the beautiful CGI that lets people experience the thrill of a story in a Galaxy far far away.

We will soon experience the power of CGI in full force , when Avatar the way of Water comes out. Because the awe people were left with, post Avatar era, they are waiting for this movie for 15 years. Let us hope CGI improves and we get to experience more beautiful Cinematography because of CGI



Saranga Das
B.Tech CSE, 8th Sem

Embracing the Convenience of Electronic Payments

In our increasingly digital world, electronic payment methods have become a convenient and efficient way to conduct financial transactions. From online shopping to peer-to-peer transfers, electronic payments have transformed the way we handle our finances. This article explores the benefits of electronic payments and how they have revolutionized the world of commerce.

Convenience and Accessibility

One of the key advantages of electronic payments is the convenience they offer. Gone are the days of carrying bulky wallets or searching for exact change. With electronic payment methods, such as credit cards, mobile wallets, and online banking, transactions can be completed swiftly and effortlessly. Whether you're purchasing goods online or paying bills, electronic payments provide a seamless experience, saving both time and effort. Furthermore, electronic payment systems are accessible 24/7, allowing individuals to make transactions at their convenience, regardless of their location.

Enhanced Security

Electronic payments have significantly improved security measures compared to traditional payment methods. Encrypted transactions and advanced authentication protocols protect sensitive financial information, reducing the risk of fraud or identity theft. Additionally, electronic payment systems often provide real-time transaction notifications, allowing users to monitor their account activity and quickly identify any suspicious transactions. By eliminating the need for physical currency, electronic payments also minimize the risk of loss or theft.

Global Reach and Financial Inclusion

Electronic payment methods have bridged geographical boundaries, enabling individuals and businesses to engage in cross-border transactions with ease. Whether it's sending money to a family member in another country or conducting international business transactions, electronic payments have eliminated the need for lengthy and costly processes associated with traditional banking systems. This global reach has also contributed to financial inclusion, as electronic payment systems have provided underserved populations with access to banking services, even in remote areas with limited infrastructure. With electronic payments, individuals and businesses can effortlessly maintain digital records of their financial transactions. This simplifies recordkeeping and eases the process of tracking expenses, making it easier to manage budgets and financial planning. Furthermore, electronic payment systems often offer

robust analytics tools that provide valuable insights into spending patterns and trends, empowering users to make informed financial decisions.

Conclusion

Electronic payments have revolutionized the way we handle transactions, offering unparalleled convenience, security, and accessibility. As digital technology continues to advance, electronic payment methods are likely to become even more integrated into our daily lives, reshaping the future of commerce and finance. Embracing electronic payments opens up a world of possibilities, simplifying financial transactions and empowering individuals and businesses to thrive in the digital age.



Sandilya Baruah
B.Tech CSE,4th Sem

Virtual reality: a glimpse of a different world

Many people associate Virtual Reality (VR) with science fiction films such as "Minority Report." However, the truth is that this technology is now totally integrated into our daily lives. Virtual reality is here and will continue in video games, medicine, and education. But what exactly is it?



What is Virtual Reality?

Virtual Reality (VR) is a computer-generated environment featuring realistic-looking images and objects that involves the viewer in their surroundings. This environment is perceived by using a Virtual Reality headset or helmet. VR enables us to immerse ourselves in video games as if we were one of the characters, learn how to do heart surgery, and improve the quality of sports training in order to achieve peak performance.

Although this appears to be quite far in the future, its beginnings are not as recent as we might think. Many people believe that one of the first Virtual Reality gadgets was called Sensorama, a machine with a built-in seat that played 3D movies, emitted smells, and generated vibrations to enhance the experience. The invention was made in the mid-1950s. Subsequent technological and software advancements over the next few years brought to a steady improvement in both devices and interface design.

History of Virtual Reality

Virtual reality has come a great way in the previous 50 years, yet it is still regarded as a developing technology. It's interesting how it works.

The first VR flight simulator, known as a Link Trainer, was created in 1929. The inventor, Edwin A. Link, utilized it to educate pilots in hazardous flying conditions.

For them to practice flying an aircraft, this simulator simulated genuine flight windscreens.

In 1961, a military engineer named Thomas Furness created the first flight simulator for the United States Air Force. It created a lot of interest in virtual reality technology and how it could be utilized for teaching.

Jaron Lanier, a researcher, created the phrase "virtual reality" considerably later, in 1987.

How does Virtual Reality works?

For end users, virtual reality creates a low-latent, rapidly updating virtual ecosystem. People who have already encountered virtual reality claim to have been transported to an imaginary domain. VR's ability to generate such immersive experiences is a tribute to its promising future.

Virtual reality operates on the fundamental basis of our perception of the world and scene comprehension. VR headsets are programmed to record human reactions to natural stimuli, which is supported by artificial intelligence algorithms. The stimuli are then saved as a featured dataset, which is then utilized to create virtual objects in a geographically mapped environment. VR designers carefully capture the complexities of real-world items and clone them accurately enough to fool the human brain.

The VR headgear controls your movement within the virtual area using built-in bone trackers. The most recent VR headsets allow you to roam around in a 360° arena and interact with virtual characters just as in real life. An external computer tethering keeps the system running 24 hours a day, seven days a week, ensuring that the flow of immersion is not interrupted at any point. VR software enhances the dynamics of your VR experience by offering aid such as language assistance, digital material, or extra brand information.

Overall, VR as a technology is still in its early stages, but more people are becoming interested in it and are optimistic about seeing what kind of changes VR can make in their everyday lives. However, more and more application scenarios are under development by experts from different fields, which allows for more specific applications and development. With how rapidly modern society has adapted to personal computers and smartphones, VR has the opportunity to become the next big technological turning point that will eventually become commonplace in most households.



Dibashree Baruah
B.Tech CSE,4th Sem

Data Robbery: Safeguarding Your Information in an Era of Cyber Threats

Data robbery, also known as data theft or data breach, refers to the unauthorized acquisition or extraction of sensitive information from a person, organization, or system. It typically involves gaining access to protected data, such as personal records, financial information, trade secrets, intellectual property, or any other confidential data, with the intention of using it for malicious purposes.

Data robbery can occur through various methods, including hacking into computer systems or networks, exploiting software vulnerabilities, social engineering, phishing attacks, malware or ransomware infections, physical theft of storage devices, or insider threats where an authorized individual abuses their access privileges.

The consequences of data robbery can be severe and wide-ranging. The stolen information can be used for identity theft, financial fraud, corporate espionage, blackmail, or sold on the dark web. It can result in financial losses, reputational damage, legal liabilities, and breaches of privacy for the affected individuals or organizations. Moreover, data breaches can also impact customer trust and confidence in the affected entity.

To mitigate the risk of data robbery, individuals and organizations should implement robust security measures such as strong passwords, encryption, firewalls, antivirus software, regular system updates, and employee training on cybersecurity best practices. Additionally, companies must adhere to data protection laws and regulations, establish incident response plans, and conduct regular security audits to identify and address vulnerabilities in their systems.

If you suspect that your personal information has been compromised in a data breach, it is crucial to take immediate action. This includes notifying the affected organization, monitoring your financial statements and credit reports for any suspicious activity, changing passwords, and considering credit monitoring or identity theft protection services.



Syed Sarfaraj AlSahi
B.Tech CSE, 4th Sem

Li-Fi Technology

The Li-Fi (light fidelity) technology was proposed by the German Scientist namely Harald Haas. The main function of this technology is to transmit the data via light. This technology is idyllic for high-speed wireless communication in a restricted region, and it offers many benefits over Wi-Fi technology such as high bandwidth, ease of use, efficiency, and safety. These systems can communicate from street lights to auto-piloted cars using their headlights.

What is LiFi Technology?

Li-Fi-light fidelity is similar to Wi-Fi technology and it is one of the future wireless communication technologies. The main feature of this technology includes fully networked, bidirectional and high-speed wireless. Nowadays, the most trending domain in wireless communication is Wi-Fi and internet users are also being increased every year. For obtaining better speed, efficiency, bandwidth, Li-Fi technology has evolved. The data transmission in this technology can be done using light because the light intensity changes quicker than the human eye for capturing. The range of data transmission in Li-Fi is faster 100 times than Wi-Fi.

How Li-Fi Works?

Li-Fi is a VLC (visible light communications) system and the speed of this system is very high. Li-Fi uses normal LEDs to allow the data to transfer and increase the speed up to 224 Gigabits/sec. The data transmission of this technology can be done via illumination. The essential devices of this system are the bright light emitting diodes. The ON/Off activity of LEDs permits a type of data transmission in the form of binary codes but the human eye cannot recognize this transform & the bulbs appear with a stable intensity.

Differences between Li-Fi & Wi-Fi

The Differences between Li-Fi and Wi-Fi include the following.

- The Bandwidth Expansion of Wi-Fi technology is limited and exceptional for Li-Fi
- The Speed of the Wi-Fi is 150 Mbps and >10 Gbps for Li-Fi
- The Data Density of Wi-Fi technology is low and high for Li-Fi
- The Range of Wi-Fi is medium and low for Li-Fi
- The Security of Wi-Fi is medium and excellent for Li-Fi
- The power availability of Wi-Fi is low and high for Li-Fi
- The ecological impact of Wi-Fi is medium and low for Li-Fi
- The cost of the Wi-Fi is medium and low for Li-Fi
- The network topologies of Li-Fi and Wi-Fi technologies is a point-to-point

Advantages of Li-Fi

The advantages of Li-Fi include the following.

- Speed-The speed of the Li-Fi is very high, and we can watch the videos without buffering.
- Security- The light of the Li-Fi doesn't run through the partition, therefore, it is more protected and hacking is not possible.
- Risk-free-Li-Fi utilizes light waves which are harmless.
- Consistent- The data transfer is more protected.

Disadvantages of Li-Fi

The disadvantages of Li-Fi include the following.

- Apart from several benefits, the Li-Fi technology is facing several problems. It requires LOS (line of sight), as well as the receiver, would not be a move in inside.
- The main problem is how the receiver will send the data back to the transmitter section.
- Another disadvantage of this technology is an interference of exterior light sources such as normal bulbs; sunlight in the lane of communication will cause intermission in the transmission.
- It doesn't work in the dim areas.

Li-Fi Technology Applications

The Li-Fi router applications over Wi-Fi are promising as well as unlimited for the wireless communication which includes the following.

- Traffic Management & Road Safety
- Medical Applications
- Aviation
- Communication Underwater
- Elegant Lighting
- Interior map-reading system for blind people
- In dangerous Environments or In Sensitive regions
- Transportations
- Industrial Areas



Sayantani Roy
B.Tech CSE, 4th Sem

Industrial Visit of Final Year CSE students at North Eastern Space Applications Centre



Student's Achievement



Dhruvan Das,
a student of B.Tech CSE has qualified GATE 2023.



Known as Fat Shady 001, Aditya Das a student of B.Tech 6th Semester, CSE Department has won the first prize in Rap Battle competition held as a part of Enajori Music Festival, on March 24, 2023.



Simanta Thakuria a student of B.Tech 8th semester, CSE Department has won 3rd position in the Men's light heavy weight category in the 2nd All Assam Amateur MMA Championship 2023 organized by United Assam Mixed Martial Arts Association (UAMMAA) which was held on 8th and 9th April 2023.



Satavisha Roy Choudhury a student of B.Tech 2nd Semester, CSE Department, Girijananda Chowdhury University, has won the 2nd prize in the Elocution competition held as a part of SAKSHAM 2023(Energy Conservation towards 'Net Zero') organized by BPCL at Girijananda Chowdhury University, Assam on May 03, 2023.



Nazath Abbas Barbhuya, a student of B.Tech 2nd semester, CSE Department, Girijananda Chowdhury University has won the first prize in mobile photography competition held as a part of UDBHABAN 2022 at SITM, Guwahati Techfest.

Student's Achievement



Dhruvan Das,
a student of B.Tech CSE has qualified GATE 2023.



Known as Fat Shady 001, Aditya Das a student of B.Tech 6th Semester, CSE Department has won the first prize in Rap Battle competition held as a part of Enajori Music Festival, on March 24, 2023.



Simanta Thakuria a student of B.Tech 8th semester, CSE Department has won 3rd position in the Men's light heavy weight category in the 2nd All Assam Amateur MMA Championship 2023 organized by United Assam Mixed Martial Arts Association (UAMMAA) which was held on 8th and 9th April 2023.



Satavisha Roy Choudhury a student of B.Tech 2nd Semester, CSE Department, Girijananda Chowdhury University, has won the 2nd prize in the Elocution competition held as a part of SAKSHAM 2023(Energy Conservation towards 'Net Zero') organized by BPCL at Girijananda Chowdhury University, Assam on May 03, 2023.



Nazath Abbas Barbhuya, a student of B.Tech 2nd semester, CSE Department, Girijananda Chowdhury University has won the first prize in mobile photography competition held as a part of UDBHABAN 2022 at SITM, Guwahati Techfest.

Student's Placement



Subhranil Ghosh, a student of 8th semester CSE has been placed in PlanetSpark.



Nitul Das, a student of 8th semester CSE has been placed in Drishti the Vision Group as an Business Development Associate.

Student's Placement



Faculty and Staff Members:

Sitting from left to right:

Ms. Shrabani Medhi, Mrs. Pinky Saikia Dutta, Dr. Minakshi Gogoi, Dr. Th. Shanta Kumar, Ms. Manjula Kalita

Standing from left to right:

Ms. Ritushree Dutta, Mrs. Rubi Kalita, Ms. Ilina Sinha, Ms. Mala Ahmed, Mrs. Mridusmita Baruah

Absentee:

Mr. Adarsh Pradhan, Mr. Amarjyoti Pathak, Prof. (Dr.) L.P. Saikia, Mr. Arindam Saha



Cover Page Design

Name: Rishik Baishya

Department of CSE, 6th Sem