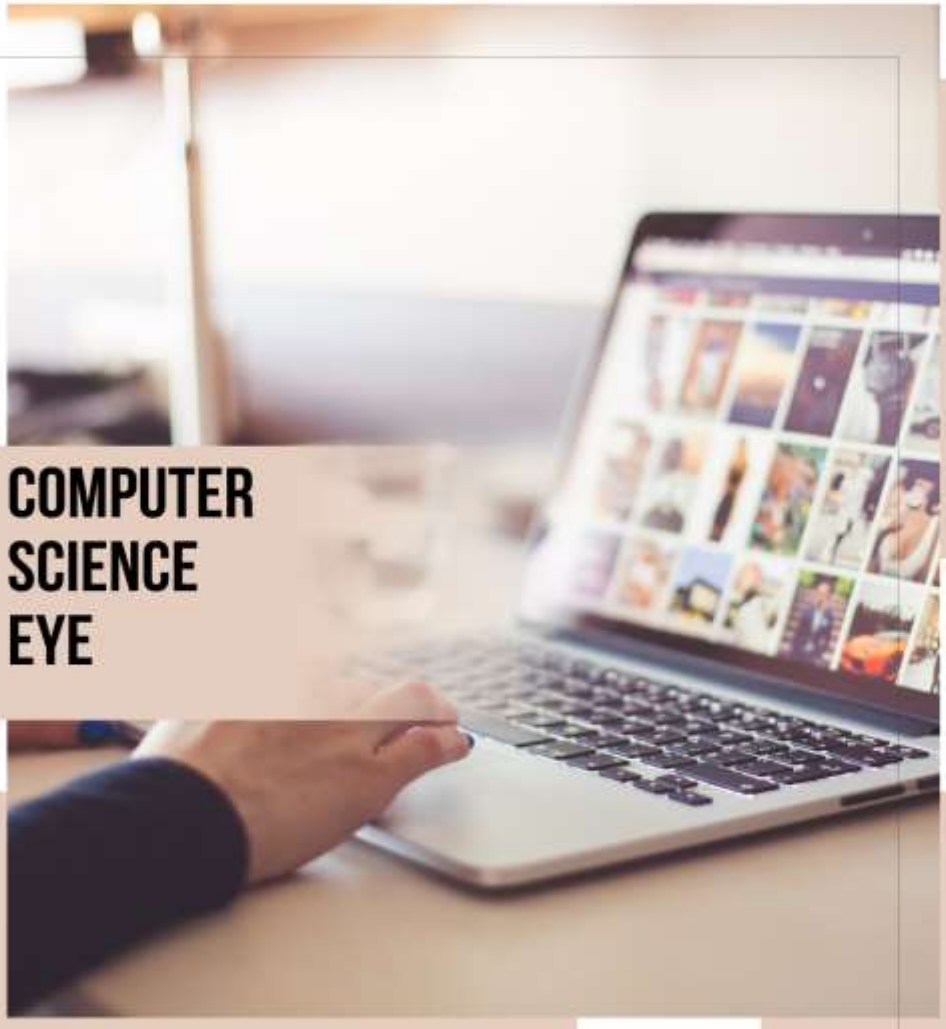
2021-22

DEPARTMENT OF COMPUTER SCIENCE



COMPUTER SCIENCE EYE

GURU NANAK COLLEGE BUDHLADA

Under the management of SGPC Sri Amritsar Sahib

NAAC Accredited "A" Grade College

Star College Status by DBT Govt. Of India & Skill Hub Institute Selected by NSDC

Contents

Principal's Message

Guru Nanak College, Budhlada is one of the premier institutions of higher education in the state and a leading educational institution of Mansa District. Among the all departments, Computer Science Department is running with a great strength of Students.

It is a great initiative taken by Faculty members and students to publish a Computer Science Magazine 2021-2022. Computer Science Department gives the result of all activities at the end of year in a form of magazine. Students' communication abilities are enhanced by contributing pieces to the magazine. It attempts to motivate students to affect change in the technological world. The journal contains the most recent developments in technology.

I'd like to end by congratulating the editorial team's staff and students on the Departmental Magazine's publication for the session (2021-2022). I'm happy to report that the computer science department has consistently produced high-quality work for departmental magazines, and I extend my best wishes to the students for a successful future.

Kuldeep Singh Bal

Associate Editor-in-Chief

Message

Dear Members of the Department,

I am pleased to welcome you all to the latest edition of our department magazine. This publication is a testament to the talent and hard work of our team, and I would like to take this opportunity to extend my gratitude to everyone who contributed.

As the head of the department, I am proud of the progress we have made this past year. We have achieved significant milestones and overcome various challenges, thanks to the dedication and commitment of each and every member. Our department has been recognized for our outstanding contributions to research, teaching, and service, and we continue to strive for excellence in all aspects of our work.

In this edition, we will showcase some of the outstanding accomplishments of our faculty, staff, and students. We will also highlight some of the exciting projects and initiatives that we have undertaken and the impact they have made in our field. I encourage you all to take the time to read through the articles and appreciate the hard work and creativity that has gone into each one.

I want to thank our editorial team for their tireless efforts in bringing this magazine to life. Their hard work and dedication have resulted in an outstanding publication that highlights the many achievements of our department.

As we move forward, I am confident that our department will continue to thrive and make a significant impact in our field. Let us continue to work together and support each other as we strive for excellence.

Thank you all for your contributions and dedication.

Sincerely,

Dr. Rekha Kalra

HoD

Computer Science

Editorial Committee

Student Members

Lovepreet kaur (BCA-III, Batch-2021-22)
Varinder Singh (MCA-II, Batch-2021-22)

Faculty Members

A.P Deepali

A.P Gurinder kaur

A.P Shabeena

About the Department

Department of computer science was established in 2004 in Guru Nanak College Budhlada. The Department is running with a current strength of 500 students. Department is equipped with 5 ultra modern computer labs with wifi facility upto 100 mbps and 200 computer systems. Department works as a root node for providing internet connectivity to all the departments of institute through its server and LAN cables. Department is running with 3 PG Courses (MCA, M.Sc. (IT) and PGDCA), 3 UG Courses (BCA, B.Voc (SD), B.Voc (CS)) and four value added courses.

Vision

To provide students with a strong foundation in computer science and preparing them for careers.

Mission

To provide a learning environment that is conducive to the development of theoretical knowledge,practical skills and innovative thinking in the field of computer science.

Faculty Profile

Name of Faculty	Designation	Qualification
Rekha Kalra	Head of Department, Assistant Professor	MCA, M.Phil, Ph.D
Narinder Singh	Assistant Professor	MCA, M.Phil, Ph.D
Geetu	Assistant Professor	MCA, M.Phil, Ph.D (Pursing)
Sandhya vats	Assistant Professor	MCA, M.Phil
Nitika Goyal	Assistant Professor	B.Tech, M.Tech
Deepali	Assistant Professor	B.Tech, M.Tech, JRF UGC(NET), GATE
Manpreet	Assistant Professor	M. tech, Ph.D (Pursing)
Gurinder Kaur	Assistant Professor	MCA, M.Tech
Shabeena	Assistant Professor	MCA
Raj Kamal	Assistant Professor	M.Tech, PHD
Amandeep Kaur	Assistant Professor	MCA
Aman Kumar	Assistant Professor	B.Tech, M.Tech
Birkaram Kaur	Assistant Professor	MCA
Ankit	Assistant Professor	MCA. UGC(NET)
Ramandeep	Assistant Professor	MCA. UGC(NET)

Academic Toppers Of The Department

Sr.No.	Class		Roll No.	Student Name	SGPA
1	B.Voc SD 3	906101	10856	SHARUTI GOYAL	10
2	B.Voc SD 3	906102	10855	PRIYA RANI	10
3	B.Voc SD 3	906103	10862	MANPREET KAUR	10
4	B.Voc SD 3	906104	10876	KOMALPREET KAUR	10
5	B.Voc SD 3	906105	10852	HARSIMRAN KAUR	10
6	B.Voc SD 3	906106	10861	ARSHDEEP KAUR	10
7	B.Voc SD 3	906107	10851	VARINDERPAL SINGH NEHAL	10
8	B.Voc SD 3	906108	10868	SUKHWINDER SINGH	10
9	B.Voc SD 3	906109	10873	SANDEEP KAUR	10
10	B.Voc SD 3	906110	10879	RITIK JINDAL	10
11	B.Voc SD 3	906111	10867	RAMPAL	10
12	B.Voc SD 3	906112	10871	PARDEEP SINGH	10
13	B.Voc SD 3	906113	10864	MEHAKDEEP SINGH	10
14	B.Voc SD 3	906114	10881	JATIN BANSAL	10
15	B.Voc SD 3	906115	10865	GURPREET SINGH	10
16	B.Voc CS 2	935908	17205	PANKAJ LOHAN	9.25
17	B.Voc CS 2	935912	17201	AZADVIR SINGH	9.1
18	B.Voc CS 3	937901	18101	SANJU	10
19	B.Voc CS 3	937902	18107	RIDHAMJEET SINGH	10
20	B.Voc CS 3	937903	18110	NAVDEEP SHARMA	10
21	B.Voc CS 3	937904	18114	JAGMEET SINGH	10
22	B.Voc CS 3	937905	18102	GAGANDEEP SINGH	10
23	B.Voc CS 3	937906	18117	DEEPAK KUMAR	10
24	B.Voc CS 3	937907	18103	BALJINDER SINGH	10
25	MCA 1	61501	1910	SUKHPREET KAUR	9.33
26	MCA 1	61505	1905	LOVEPREET KAUR	9.17
27	MCA 1	61506	1907	HARWINDER KAUR	9.67
28	MCA 1	61511	1902	ARSHDEEP KAUR	9.67

Achievements

Roll number	Class	Name	Event	Position
1125	BCA-I	Sanket Sharma	Luddi	Ist
1911	MCA-I	Gurwinder Kaur	Luddi	Ist
1051	BCA-III	Manmeet Singh	Nukad Natak	2nd
10517	MSc-IT-I	Ashish Kumar	Short Movie	Ist
1911	MCA-I	Gurwinder Kaur	Short Movie	Ist
2039	PGDCA	Kashmir Singh	Bhand	Ist
2021	PGDCA	Kuldeep Singh	Komal Klawan	Ist
2037	PGDCA	Gursevak Singh	FolK Orchestra	Ist
1911	MCA-I	Gurwinder Kaur	Theatre- One Act Play	Ist
1911	MCA-I	Gurwinder Kaur	Skit	Ist
2039	PGDCA	Kashmir Singh	Skit	Ist
1039	BCA-III	Amritpal Singh	Mimicri	3rd
2041	PGDCA	Varun Sharma	Bhangra	2nd
2042	PGDCA	Manjinder Singh	Bhangra	2nd
10936	B.Voc-SD-I	Gourvpreet Singh	Bhangra	2nd
11131	B.Voc-SD-II	Gursewak Singh	Bhangra	2nd
11131	B.Voc-SD-II	Gursewak Singh	Jhummar	Ist
2041	PGDCA	Varun Sharma	Jhummar	Ist
2042	PGDCA	Manjinder Singh	Jhummar	Ist
2051	PGDCA	AMRITPAL SINGH	VollyBall	Ist
2065	PGDCA	DEEPAK BANSAL	Chess	Ist
2063	PGDCA	GURWINDER SINGH SANDHU	VollyBall	Ist
2060	PGDCA	manjinder singh	Gatka	Ist
813	m.Sc iT(LT)	GURLOVELEEN SINGH	Gatka	Ist
811	m.Sc iT(LT)	JASPREET SINGH	VollyBall	Ist
812	m.Sc iT(LT)	OMKAR SINGH	VollyBall	Ist
2059	PGDCA	gurwinder singh	Basket Ball	Second

Extension Activities

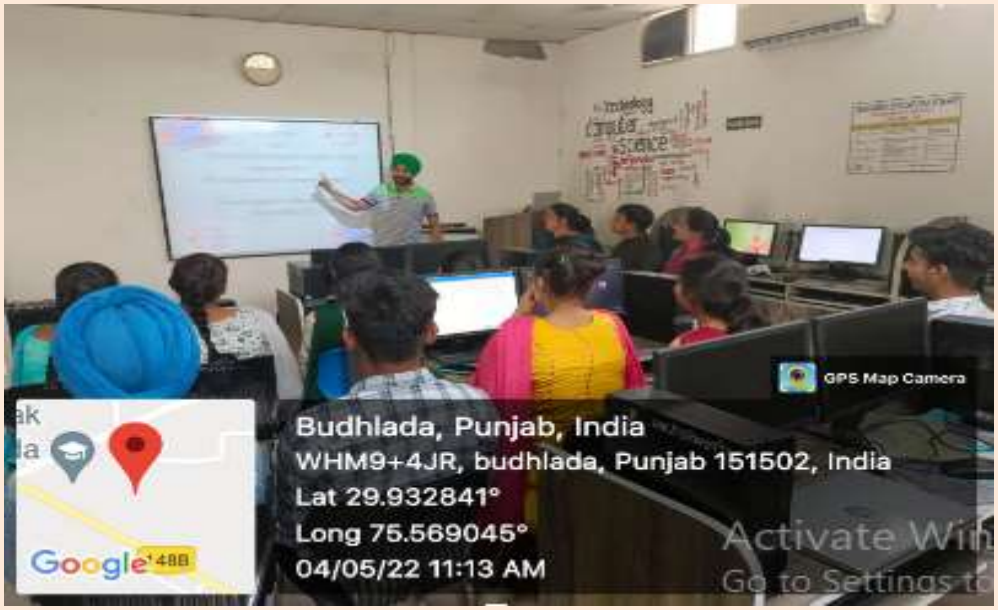
One Day Seminar on soft skills

The PG department of Computer Science has organized seminar on soft skill. This seminar was presented by Assist. Prof Nitika Goyal.

Poster Making Competition on Environment Day:

The purpose to organized this competition to raise awareness on the problem facing our environment such as air pollution, plastic pollution and illegal wildlife trade sustainable consumption among the students.

Seminar on Web Development:



To enhance the Programming Skills in web development, Department of Computer Science Organized One Day Workshop for all students presented by Assistant Professor Aman Kumar

Celebrating Teacher Day

On this Teacher's day, the presence of a teacher in a student's life can boost their moral and guide them to become more valuable in life. We all have teachers who have influenced our lives in some way or the other.

Cultural Program

Nowadays, education is not just confined to imparting academic knowledge to the students. However, it is more about holistic development. The modern-day parents want their children to develop into winning personalities with a global perspective. They want their child to be a 'jack of all trades'. So, they have lots of expectations from a College in his/her regard.

The College can mold the students holistically by exposing them to an array of activities along with academics. Cultural activities play a key role in the overall personality development of students. Different types of cultural activities can give different exposure to students. These instill confidence in students and foster a better understanding of the surroundings. The cultural activities also instill life skills and social skills in the students.

Students of Department of Computer Science Participated in Cultural Events

Tour/Trips

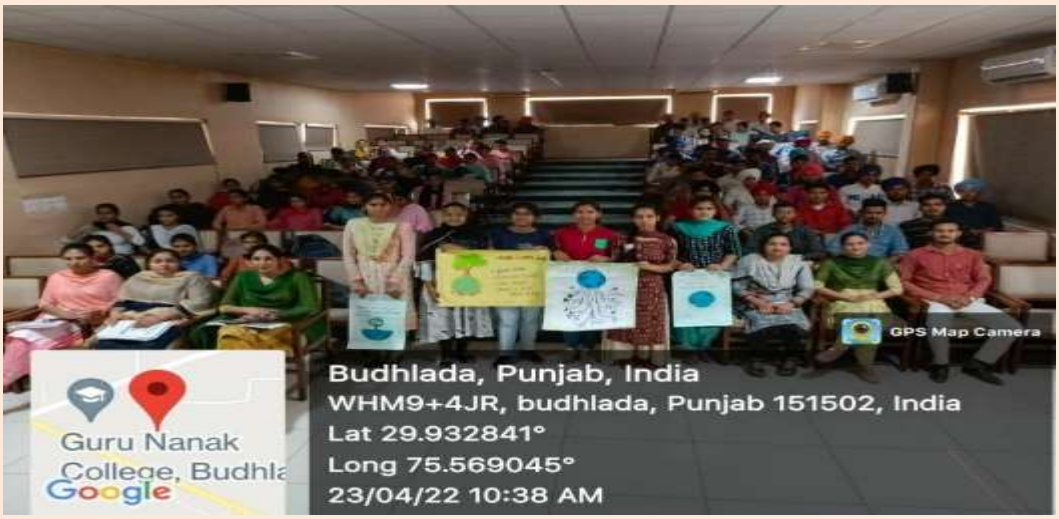
Educational tour

Students of computer science department visit education trip in Chandigarh.

Students of Computer Science Department visited " Nada Sahib Gurdhwara "

Slogan writing Competition on Earth day:

Earth day is an annual celebration that honors the achievements of the environment movement and raises awareness of the need to protect Earth natural recourses for future generations.



7 Days Orientation Programme for school students

Teacher Corner

Information technology (IT) has had a profound impact on virtually every aspect of modern society, from communication and commerce to entertainment, education, and healthcare. The role of information technology is to facilitate the collection, processing, storage, and dissemination of information.

Some specific roles of information technology include:

Communication: IT has revolutionized the way we communicate, making it faster, easier, and more efficient. With tools like email, instant messaging, and social media, people can connect with each other across vast distances in real-time.

Business: IT has transformed the way businesses operate, making it possible to automate processes, manage data more effectively, and improve productivity. Companies use software applications for everything from accounting and payroll to marketing and customer service.

Education: IT has made education more accessible and interactive, with online courses, e-learning platforms, and educational software. Students can access educational resources from anywhere in the world and learn at their own pace.

Entertainment: IT has transformed the entertainment industry, with streaming services, video games, and social media platforms providing new ways to enjoy music, movies, and TV shows.

Healthcare: IT has had a significant impact on healthcare, with electronic health records, telemedicine, and medical devices helping to improve patient care and outcomes.

Overall, the role of information technology is to provide the tools and infrastructure necessary for people and organizations to effectively manage and use information to achieve their goals.

Amandeep Kaur

Assistant Professor

Computer networking

Computer networking refers to interconnected computing devices that can exchange data and share resources with each other. These networked devices use a system of rules, called communications protocols, to transmit information over physical or wireless technologies.

How does a computer network work?

Nodes and links are the basic building blocks in computer networking. A network node may be data communication equipment (DCE) such as a modem, hub or, switch, or data terminal equipment (DTE) such as two or more computers and printers. A link refers to the transmission media connecting two nodes. Links may be physical, like cable wires or optical fibers, or free space used by wireless networks.

In a working computer network, nodes follow a set of rules or protocols that define how to send and receive electronic data via the links. The computer network architecture defines the design of these physical and logical components. It provides the specifications for the network's physical components, functional organization, protocols, and procedures.

What do computer networks do?

Computer networks were first created in the late 1950s for use in the military and defense. They were initially used to transmit data over telephone lines and had limited commercial and scientific applications. With the advent of internet technologies, a computer network has become indispensable for enterprises.

Modern-day network solutions deliver more than connectivity. They are critical for the digital transformation and success of businesses today. Underlying network capabilities have become more programmable, automated, and secure.

Modern computer networks can:

Operate virtually

The underlying physical network infrastructure can be logically partitioned to create multiple "overlay" networks. In an overlay computer network, the nodes are virtually linked, and data can be transmitted between them through multiple physical paths. For example, many enterprise networks are overlaid on the internet.

Integrate on a large scale

Modern networking services connect physically distributed computer networks. These services can optimize network functions through automation and monitoring to create one large-scale, high-performance network. Network services can be scaled up or down based on demand.

Respond quickly to changing conditions

Many computer networks are software-defined. Traffic can be routed and controlled centrally using a digital interface. These computer networks support virtual traffic management.

Provide data security

All networking solutions come with in-built security features like encryption and access control. Third-party solutions like antivirus software, firewalls, and antimalware can be integrated to make the network more secure.

What are the types of computer network architecture?

Computer network design falls under two broad categories:

1. Client-server architecture

In this type of computer network, nodes may be servers or clients. Server nodes provide resources like memory, processing power, or data to client nodes. Server nodes may also manage client node behavior. Clients may communicate with each other, but they do not share resources. For example, some computer devices in enterprise networks store data and configuration settings. These devices are the servers in the network. Clients may access this data by making a request to the server machine.

2. Peer-to-peer architecture

In Peer-to-Peer (P2P) architecture, connected computers have equal powers and privileges. There is no central server for coordination. Each device in the computer network can act as either client or server. Each peer may share some of its resources, like memory and processing power, with the entire computer network. For example, some companies use P2P architecture to host memory-consuming applications, such as 3-D graphic rendering, across multiple digital devices.

What is network topology?

The arrangement of nodes and links is called network topology. They can be configured in different ways to get different outcomes. Some types of network topologies are:

Bus topology

Each node is linked to one other node only. Data transmission over the network connections occurs in one direction.

Ring topology

Each node is linked to two other nodes, forming a ring. Data can flow bi-directionally. However,single node failure can bring down the entire network.

Star topology

A central server node is linked to multiple client network devices. This topology performs better as data doesn't have to go through each node. It is also more reliable.

Mesh topology

Every node is connected to many other nodes. In a full mesh topology, every node is connected to every other node in the network.

Gurinder Kaur

Assistant Professor

Big Data

What is Data?

The quantities, characters, or symbols on which operations are performed by a computer, which may be stored and transmitted in the form of electrical signals and recorded on magnetic, optical, or mechanical recording media.

Example of Big Data:

Following are some of the Big Data examples-

The New York Stock Exchange is an example of Big Data that generates about *one terabyte* of new trade data per day.

Social Media

The statistic shows that *500+terabytes* of new data get ingested into the databases of social media site Facebook, every day. This data is mainly generated in terms of photo and video uploads, message exchanges, putting comments etc.

Types Of Big Data

Following are the types of Big Data:

- Structured
- Unstructured
- Semi-structured

Structured

Any data that can be stored, accessed and processed in the form of fixed format is termed as a 'structured' data. Over the period of time, talent in computer science has achieved greater success in developing techniques for working with such kind of data (where the format is well known in advance) and also deriving value out of it. However, nowadays, we are foreseeing issues when a size of such data grows to a huge extent, typical sizes are being in the rage of multiple zettabytes.

Unstructured

Any data with unknown form or the structure is classified as unstructured data. In addition to the size being huge, un-structured data poses multiple challenges in terms of its processing for deriving value out of it. A typical example of unstructured data is a heterogeneous data source containing a combination of simple text files, images, videos etc. Now day organizations have wealth of data available with them but unfortunately, they don't know how to derive value out of it since this data is in its raw form or unstructured format.

Examples Of Un-structured Data

Semi-structured

Semi-structured data can contain both the forms of data. We can see semi-structured data as a structured in form but it is actually not defined with e.g. a table definition in relational DBMS. Example of semi-structured data is a data represented in an XML file.

Shabeena Garg

Assistant Professor

Student Corner

Cloud Computing

Cloud computing is on-demand access, via the internet, to computing resources—applications, servers (physical servers and virtual servers), data storage, development tools, networking capabilities, and more—hosted at a remote data center managed by a cloud services provider (or CSP). The CSP makes these resources available for a monthly subscription fee or bills them according to usage.

Compared to traditional on-premises IT, and depending on the cloud services you select, cloud computing helps do the following:

Lower IT costs: Cloud lets you offload some or most of the costs and effort of purchasing, installing, configuring, and managing your own on-premises infrastructure.

Improve agility and time-to-value: With cloud, your organization can start using enterprise applications in minutes, instead of waiting weeks or months for IT to respond to a request, purchase and configure supporting hardware, and install software. Cloud also lets you empower certain users—specifically developers and data scientists—to help themselves to software and support infrastructure.

Scale more easily and cost-effectively: Cloud provides elasticity—instead of purchasing excess capacity that sits unused during slow periods, you can scale capacity up and down in response to spikes and dips in traffic. You can also take advantage of your cloud provider's global network to spread your applications closer to users around the world.

Cloud security

Traditionally, security concerns have been the primary obstacle for organizations considering cloud services, particularly public cloud services. In response to demand, however, the security offered by cloud service providers is steadily outstripping on-premises security solutions.

Maintaining cloud security demands different procedures and employee skillsets than in legacy IT environments. Some cloud security best practices include the following:

- **Shared responsibility for security:** Generally, the cloud provider is responsible for securing cloud infrastructure and the customer is responsible for protecting its data within the cloud—but it's also important to clearly define data ownership between private and public third parties.

- **Data encryption:** Data should be encrypted while at rest, in transit, and in use. Customers need to maintain full control over security keys and hardware security module.

- **User identity and access management:** Customer and IT teams need full understanding of and visibility into network, device, application, and data access.

- **Collaborative management:** Proper communication and clear, understandable processes between IT, operations, and security teams will ensure seamless cloud integrations that are secure and sustainable.

- **Security and compliance monitoring:** This begins with understanding all regulatory compliance standards applicable to your industry and setting up active monitoring of all connected systems and cloud-based services to maintain visibility of all data exchanges between public, private, and hybrid cloud environments.

Sonam kaur
1956
MCA-II

5 G Technology

Fifth-generation wireless (5G) is the latest iteration of cellular technology, engineered to greatly increase the speed and responsiveness of wireless networks. With 5G, data transmitted over wireless broadband connections can travel at multigigabit speeds, with potential peak speeds as high as 20 gigabits per second (Gbps) by some estimates. These speeds exceed wireline network speeds and offer latency of below 5 milliseconds (ms) or lower, which is useful for applications that require real-time feedback. 5G will enable a sharp increase in the amount of data transmitted over wireless systems due to more available bandwidth and advanced antenna technology.

5G networks and services will be deployed in stages over the next several years to accommodate the increasing reliance on mobile and internet-enabled devices. Overall, 5G is expected to generate a variety of new applications, uses and business cases as the technology is rolled out.

How does 5G work?

Wireless networks are composed of cell sites divided into sectors that send data through radio waves. Fourth-generation (4G) Long-Term Evolution (LTE) wireless technology provides the foundation for 5G. Unlike 4G, which requires large, high-power cell towers to radiate signals over longer distances, 5G wireless signals are transmitted through large numbers of small cell stations located in places like light poles or building roofs. The use of multiple small cells is necessary because the millimeter wave (mmWave) spectrum-- the band of spectrum between 30 and 300 gigahertz (Ghz) that 5G relies on to generate high speeds -- can only travel over short distances and is subject to interference from weather and physical obstacles, like buildings or trees.

Previous generations of wireless technology have used lower-frequency bands of spectrum. To offset the challenges relating to distance and interference with mmWave, the wireless industry is also considering the use of a lower-frequency spectrum for 5G networks so network operators could use spectrum they already own to build out their new networks. Lower-frequency spectrum reaches greater distances but has lower speed and capacity than mmWave.

What are the benefits of 5G?

Even though the downsides of 5G are clear when considering how easily mmWave can be blocked, or less clear considering radio frequency (RF) exposure limits, 5G still has plenty of worthy benefits, such as the following:

use of higher frequencies;

high bandwidth;

enhanced mobile broadband;

a lower latency of 5 ms;

higher data rates, which will enable new technology options over 5G networks, such as 4K streaming or near-real-time streaming of virtual reality (VR); and the potential to have a 5G mobile network made up of low-band, midband and mmWave frequencies.

DEEPAK KUMAR
18117, B.Voc CS-III

Cyber Security

Cyber security is the practice of defending computers, servers, mobile devices, electronic systems, networks, and data from malicious attacks. It's also known as information technology security or electronic information security. The term applies in a variety of contexts, from business to mobile computing, and can be divided into a few common categories.

- **Network security** is the practice of securing a computer network from intruders, whether targeted attackers or opportunistic malware.
- **Application security** focuses on keeping software and devices free of threats. A compromised application could provide access to the data its designed to protect. Successful security begins in the design stage, well before a program or device is deployed.
- **Information security** protects the integrity and privacy of data, both in storage and in transit.
- **Operational security** includes the processes and decisions for handling and protecting data assets. The permissions users have when accessing a network and the procedures that determine how and where data may be stored or shared all fall under this umbrella.
- **Disaster recovery and business continuity** define how an organization responds to a cyber-security incident or any other event that causes the loss of operations or data. Disaster recovery policies dictate how the organization restores its operations and information to return to the same operating capacity as before the event. Business continuity is the plan the organization falls back on while trying to operate without certain resources.
- **End-user education** addresses the most unpredictable cyber-security factor: people. Anyone can accidentally introduce a virus to an otherwise secure system by failing to follow good security practices. Teaching users to delete suspicious email attachments, not plug in unidentified USB drives, and various other important lessons is vital for the security of any organization.

ARSHDEEP KAUR
10861, B.Voc SD-III

Encryption

Encryption is a way of scrambling data so that only authorized parties can understand the information. In technical terms, it is the process of converting human-readable plaintext to incomprehensible text, also known as cipher text. In simpler terms, encryption takes readable data and alters it so that it appears random. Encryption requires the use of a cryptographic key: a set of mathematical values that both the sender and the recipient of an encrypted message agree on.

Although encrypted data appears random, encryption proceeds in a logical, predictable way, allowing a party that receives the encrypted data and possesses the right key to decrypt the data, turning it back into plaintext. Truly secure encryption will use keys complex enough that a third party is highly unlikely to decrypt or break the ciphertext by brute force — in other words, by guessing the key.

Data can be encrypted "at rest," when it is stored, or "in transit," while it is being transmitted somewhere else.

What is a key in cryptography?

A cryptographic key is a string of characters used within an encryption algorithm for altering data so that it appears random. Like a physical key, it locks (encrypts) data so that only someone with the right key can unlock (decrypt) it.

What are the different types of encryption?

The two main kinds of encryption are symmetric encryption and asymmetric encryption. Asymmetric encryption is also known as public key encryption.

In symmetric encryption, there is only one key, and all communicating parties use the same (secret) key for both encryption and decryption. In asymmetric, or public key, encryption, there are two keys: one key is used for encryption, and a different key is used for decryption. The decryption key is kept private (hence the "private key" name), while the encryption key is shared publicly, for anyone to use (hence the "public key" name). Asymmetric encryption is a foundational technology for TLS (often called SSL).

Why is data encryption necessary?

Privacy: Encryption ensures that no one can read communications or data at rest except the intended recipient or the rightful data owner. This prevents attackers, ad networks, Internet service providers, and in some cases governments from intercepting and reading sensitive data, protecting user privacy.

Security: Encryption helps prevent data breaches, whether the data is in transit or at rest. If a corporate device is lost or stolen and its hard drive is properly encrypted, the data on that device will still be secure. Similarly, encrypted communications enable the communicating parties to exchange sensitive data without leaking the data.

Data integrity: Encryption also helps prevent malicious behavior such as on-path attacks. When data is transmitted across the Internet, encryption ensures that what the recipient receives has not been viewed or tampered with on the way.

Regulations: For all these reasons, many industry and government regulations require companies that handle user data to keep that data encrypted. Examples of regulatory and compliance standards that require encryption include HIPAA, PCI-DSS, and the GDPR.

SIMRANDEEP SINGH

17223, B.Voc CS-II

Machine Learning Tutorial

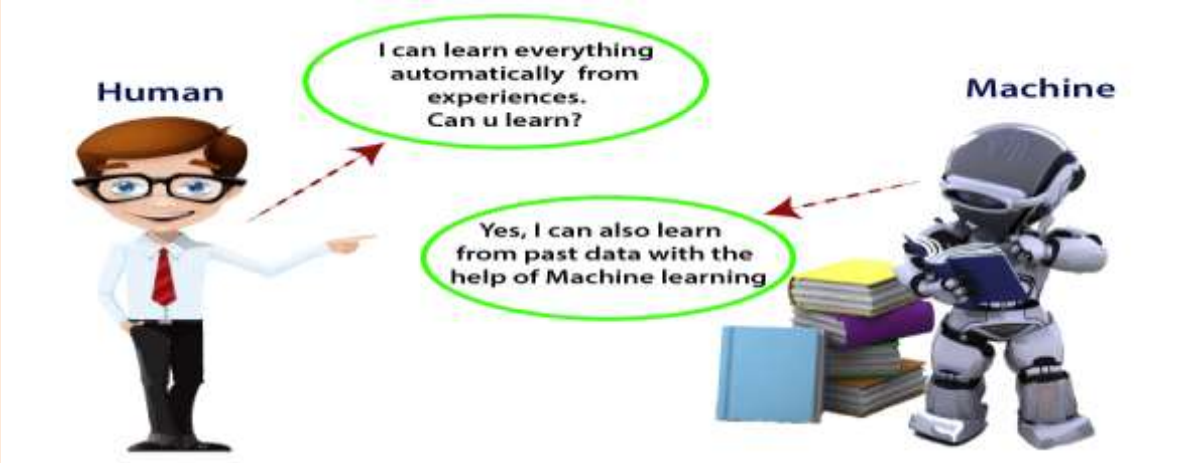
Machine Learning tutorial provides basic and advanced concepts of machine learning. Our machine learning tutorial is designed for students and working professionals.

Machine learning is a growing technology which enables computers to learn automatically from past data. Machine learning uses various algorithms for building mathematical models and making predictions using historical data or information**.** Currently, it is being used for various tasks such as image recognition**,** speech recognition**,** email filtering**,** Facebook auto-tagging**,** recommender system, and many more.

This machine learning tutorial gives you an introduction to machine learning along with the wide range of machine learning techniques such as Supervised**,** Unsupervised**,** and Reinforcement learning. You will learn about regression and classification models, clustering methods, hidden Markov models, and various sequential models.

What is Machine Learning?

In the real world, we are surrounded by humans who can learn everything from their experiences with their learning capability, and we have computers or machines which work on our instructions. But can a machine also learn from experiences or past data like a human does? So here comes the role of Machine Learning**.**



Machine Learning is said as a subset of artificial intelligence that is mainly concerned with the development of algorithms which allow a computer to learn from the data and past experiences on their own. The term machine learning was first introduced by Arthur Samuel in 1959. We can define it in a summarized way as:

Machine learning enables a machine to automatically learn from data, improve performance from experiences, and predict things without being explicitly programmed.

With the help of sample historical data, which is known as training data, machine learning algorithms build a mathematical model that helps in making predictions or decisions without being explicitly programmed. Machine learning brings computer science and statistics together for creating predictive models. Machine learning constructs or uses the algorithms that learn from historical data. The more we will provide the information, the higher will be the performance.

SANDEEP SINGH
2022
PGDCA

ਮੈਂ ਨਫ਼ਰਤ ਨੂੰ ਜ਼ਮਾਨੇ ਤੋਂ ਮੁਕਾਣਾ ਏ ਤੇ ਜਾਣਾ ਏ

ਮੈਂ ਨਫ਼ਰਤ ਨੂੰ ਜ਼ਮਾਨੇ ਤੋਂ ਮੁਕਾਣਾ ਏ ਤੇ ਜਾਣਾ ਏ।
ਮੁਹੱਬਤ ਦੇ ਗੁਰਾਂ ਨੂੰ ਅਜਮਾਣਾ ਏ ਤੇ ਜਾਣਾ ਏ।

ਮਰਨ ਤੋਂ ਬਾਅਦ ਜੱਨਤ ਦੀ ਤਲਬ ਹਰਗਿਜ਼ ਨਹੀਂ ਮੈਨੂੰ,
ਮੈਂ ਇਸ ਧਰਤੀ ਨੂੰ ਹੀ ਜੱਨਤ ਬਨਾਣਾ ਏ ਤੇ ਜਾਣਾ ਏ।

ਇਹ ਜਿਹੜੇ ਜਬਰ ਸਹਿੰਦੇ ਨੇ ਅਤੇ ਚੁੱਪ ਚਾਪ ਰਹਿੰਦੇ ਨੇ,
ਉਨ੍ਹਾਂ ਦੀ ਸੋਚ ਵਿਚ ਦੀਵਾ ਜਗਾਣਾ ਏ ਤੇ ਜਾਣਾ ਏ।

ਮੈਂ ਹੁਣ ਦੁੱਖਾਂ ਤੇ ਭੁੱਖਾਂ ਦੀ ਹਯਾਤੀ ਹੋਰ ਨਹੀਂ ਜੀਣੀ,
ਖ਼ੁਸ਼ੀ ਭਰਿਆ ਨਵਾਂ ਸੂਰਜ ਉਗਾਣਾ ਏ ਤੇ ਜਾਣਾ ਏ।

ਜਦੋਂ ਦੁਨੀਆ ਦੇ ਮਜ਼ਲੂਮਾਂ 'ਚ ਬਾਬਰ ਏਕਤਾ ਆਣੀ,
ਤੇ ਫ਼ਿਰ ਜ਼ਾਲਮ ਨੇ ਅਪਣਾ ਸਿਰ ਲੁਕਾਣਾ ਏ ਤੇ ਜਾਣਾ ਏ।

BALWINDER SINGH
1282

ਮੈਂ ਏਸ ਮਾਇਆ ਰੂਪੀ ਸੰਸਾਰ

ਮੈਂ ਏਸ ਮਾਇਆ ਰੂਪੀ ਸੰਸਾਰ
ਦੇ ਚੱਕਰਾਂ ਵਿਚ ਅਜਿਹਾ ਫਸਿਆ
ਕਿ ਮੇਰੀ ਹਿੰਦੂ ਤੇ ਮੁਸਲਮਾਨ ਜਨਤਾ
ਇਹ ਚਾਰ ਦਿਨਾਂ ਦੀ ਚਾਨਣੀ ਏ
ਅਸੀਂ ਇਥੇ ਕੁਝ ਚਿਰ ਲਈ ਖੇਡਕੇ
ਮੁੜ ਆਪਣੇ ਘਰ ਨੂੰ ਜਾਣਾ ਏ

BUTA SINGH

810

ਥਾਂ-ਥਾਂ ਵਿੱਚ ਕਿਤਾਬਾਂ ਪੜ੍ਹਿਆ

ਥਾਂ-ਥਾਂ ਵਿੱਚ ਕਿਤਾਬਾਂ ਪੜ੍ਹਿਆ, ਕੌਲ ਬੜੇ ਦਾਨਾਵਾਂ ਦਾ ।
ਆਖ਼ਰ ਇਕ ਦਿਨ ਟੁੱਟ ਕੇ ਰਹਿਣੈ, ਅੰਨ੍ਹਾਂ ਜ਼ੋਰ ਹਵਾਵਾਂ ਦਾ ।

ਕੱਲ੍ਹ ਨੂੰ ਫੇਰ ਇਹ ਧੁੱਪ ਦੀ ਚਾਦਰ ਲੈ ਕੇ ਟੁਰਨਾ ਪੈ ਜਾਣੈਂ,
ਆਪਣੇ ਆਪ ਨੂੰ ਬਹੁਤਾ ਵੀ ਨਾ ਆਦੀ ਕਰ ਲਈਂ ਛਾਵਾਂ ਦਾ ।

ਸੋਚੋ ਕਿਸ ਨੇ ਏਥੇ ਲਹੂ ਦੀਆਂ ਨਹਿਰਾਂ ਆਨ ਵਗਾਈਆਂ ਨੇ,
ਕਿਹੜਾ ਥਲ ਹੈ ਜਿਹੜਾ ਪਾਣੀ, ਪੀ ਗਿਆ ਪੰਜ ਦਰਿਆਵਾਂ ਦਾ ।

ਅਜ ਤੱਕ ਕਿੱਧਰੇ ਬੋਹੜ ਜਿਹੀ ਗੁੜ੍ਹੀ ਛਾਂ ਸੱਜਣੋਂ ਦੇਖੀ ਨਾ,
ਲੱਭਣ ਜਾਈਏ ਤੇ ਨਹੀਂ ਲੱਭਦਾ ਪਿਆਰ ਕਿਤੇ ਵੀ ਮਾਵਾਂ ਦਾ ।

ਜੋ ਕੀਤਾ ਈ ਉਹਦੇ ਉੱਤੇ 'ਕੰਵਲ' ਕਦੀ ਪਛਤਾਵੀਂ ਨਾ,
ਨਹੀਂ ਤੇ ਜਿਸਮ ਨੂੰ ਖਾ ਜਾਵੇਗਾ, ਇਹ ਅਹਿਸਾਸ ਗੁਨਾਹਵਾਂ ਦਾ ।

ਤਾਨੀਆ

1055

West Wind

O wild West Wind, thou breath of Autumn's being,
Thou, from whose unseen presence the leaves dead
Are driven, like ghosts from an enchanter fleeing,

Yellow, and black, and pale, and hectic red,
Pestilence-stricken multitudes: O thou,
Who chariotest to their dark wintry bed

The winged seeds, where they lie cold and low,
Each like a corpse within its grave, until
Thine azure sister of the Spring shall blow

Her clarion o'er the dreaming earth, and fill
(Driving sweet buds like flocks to feed in air)
With living hues and odours plain and hill:

Wild Spirit, which art moving everywhere;
Destroyer and preserver; hear, oh hear!

ANMOL SINGH

11115

Computer Science Faulty Profile

AP REKHA KALRA

AP NARINDER SINGH

AP SANDHYA VATTS

AP NITIKA GOYAL

AP GEETU

AP DEEPALI GOYAL

AP GURINDER KAUR

AP SHABEENA GARG

AP AMANDEEP KAUR

AP AMAN KUMAR

ਗੁਰੂ ਨਾਨਕ ਕਾਲਜ

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