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DEPARTMENT OF
BIOTECHNOLOGY

VOLUME 8, ISSUE 1
AUGUST 2025

DBT STAR COLLEGE
(Under Strengthening Components)

Mail to: csc@sfc.ac.in

SFC - BYTES
VOLUME 8, ISSUE 1

NEWS LETTER



DEPARTMENT OF COMPUTER SCIENCE
ST. FRANCIS COLLEGE FOR WOMEN, HYD-16

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PRINCIPAL- DR. UMA JOSEPH

AI and Academics

In an era where Artificial Intelligence (AI) and Machine Learning (ML) are transforming the very fabric of our lives—from healthcare to education, governance to industry—it is both a privilege and a responsibility to be part of an academic institution shaping the minds of tomorrow.

As academicians, we are not only disseminators of knowledge but also architects of future ethics, creators of responsible innovation, and mentors to young minds who will design the tools of tomorrow. AI and ML are not just technical fields—they are deeply intertwined with human values, social structures, and global equity. Therefore, our role is more critical now than ever before.

We must empower students with not only technical skills, but also with ethical understanding, critical thinking, and a deep sense of responsibility. As educators, we must encourage open dialogues on the implications of AI: privacy concerns, algorithmic bias, employment disruptions, and the importance of transparency in automated systems. Let us not just ask *can we do it, but always should we do it?*

We must act as bridges between research and real-world implementation. By collaborating with industries, policy-makers, and communities, we can ensure that AI solutions address real problems—sustainability, accessibility, healthcare gaps, education for all—while minimizing harm and exclusion.

Let us use our academic voice to guide society towards a future where AI and ML uplift every section of humanity, rather than divide it.

As stewards of knowledge, we are called to shape our future wisely.

Warm regards,

Prof. Uma Joseph

Principal, St. Francis College for Women



DEPARTMENT OF COMPUTER SCIENCE

The department was established in 1988, an iconic year in the lifeline of St. Francis College as it marks the grant of autonomy to the college. Computer Science is an interdisciplinary field and it is as much about teaching and learning of computer science as it is about the areas that impact on computer science – mathematics, linguistics, natural sciences, psychology, philosophy and how they interrelate with the theory and practice of education. Highly qualified and dedicated teaching faculty supported by equally able and competent lab faculty are the strength of the department. The college has hi-tech state of the art computer labs with over 400 high end computer terminals facilitated with high-speed internet access and connected to Linux and Windows servers equipped with all the required licensed software.

The department offers an assortment of programs at the undergraduate level, M.Sc. Computer Science(AI & ML), M.Sc. Data Science at the postgraduate level and CCNA certification course. While we believe man is still the most extraordinary computer of all, we endeavour to provide the best possible exposure and training to the students, making them strong to face the IT challenges of the world.



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EVENTS HELD

EVENTS HELD


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**DEPARTMENT OF COMPUTER SCIENCE
ORGANIZES**
**EXPLORING COMPUTERS: A STARTER'S GUIDE
BRIDGE COURSE
C@NNECT 8.0**
For all 1st Year Computer Science Students
(1B,1D,1F,1H and B.Com CAP)

GEROSA HALL

**25- JUNE-2025
1:10PM-3:10PM**


Bridge Course

Exploring Computers: A Starters Guide

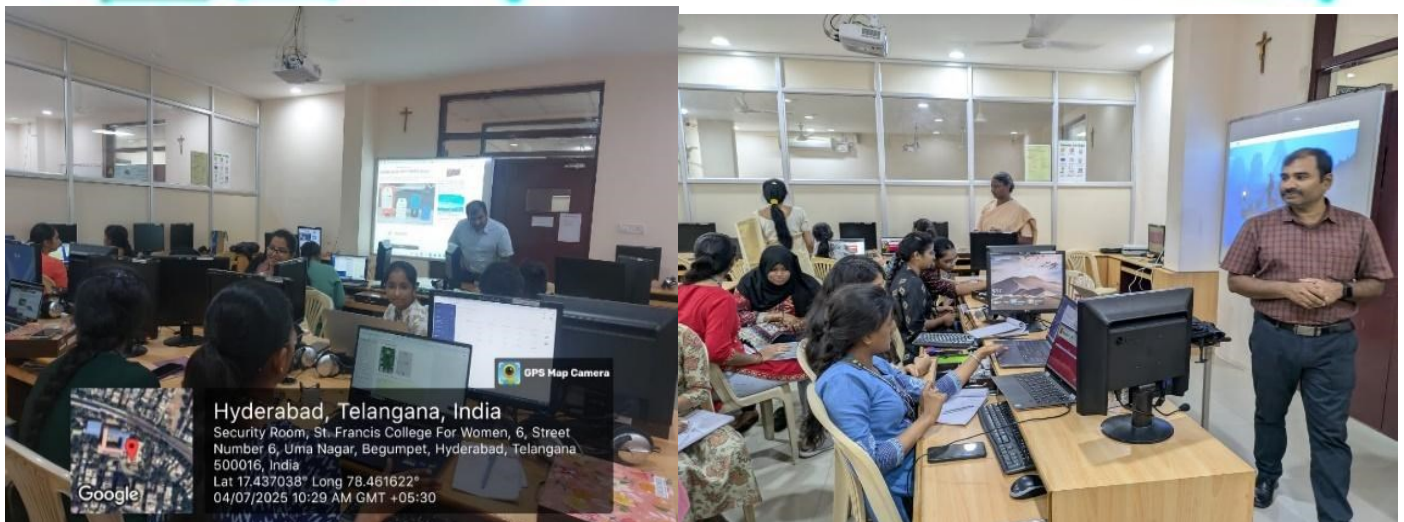
The Department of Computer Science organized C@nnect 8.0, A Bridge Course – “Exploring Computers: A Starters Guide” for B.Sc. 1st year Computer Science students and B. Com 1st year students on 25th June 2025. The number of students attended were around 150. The resource persons were the faculty of the Department of Computer Science – Ms. Savitri, Ms. Vani, Ms. Preethi, Ms. Ummya, Ms. Jenifer and Ms. Indhuri SreeLakshmi. Our Head of the department, Dr. Sr.Sujatha Yeruva inaugurated the event with an address to the students and a prayer. Ms. Divya started off the session with an introduction to Bridge course and an insight about c@nnect events. Various topics like Introduction to computer generations and history, types of computer Languages, Types of software input/output devices, Algorithms and flowcharts, Introduction Microsoft office tools and basic terminologies of internet were discussed. The session was followed by a fun quiz activity and students participated actively. To conclude, it was a successful event which helped the students gain insight on Basics of computers

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DEPARTMENT OF COMPUTER SCIENCE
Organizes
C@NNECT 8.1
Series of IoT Workshop
For MSc AI & ML II Year

COMPUTER LAB 6

25TH JUNE -31ST JULY 2025
9 AM-10:30 AM



Series of IoT Workshop

The Department of Computer Science organized **C@nnect 8.1**, A series of IoT workshop for M.Sc. 1st year Data Science and AI & ML students on 25th June 2025 to 31st July 2025. The number of students attended were around 40.

The resource person was Mr. Satish Rao. The workshop included IoT fundamentals, Raspberry Pi setup, remote programming, and hardware control projects such as LED operation, traffic light simulation, and button-controlled systems. Participants learned to: Understand IoT concepts and CCC types. Set up and configure Raspberry Pi for IoT applications. Use remote programming tools like **PuTTY** and **VNC Viewer**. Program and control hardware components (LEDs, traffic lights, buttons) using Python and GPIO. The interactive sessions and hands-on approach made the learning experience effective and engaging.

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DEPARTMENT OF COMPUTER SCIENCE
C@NNECT 8.2
Organizes
SMART SKILLS FOR SMART NURSING
Session - I
On
Accessing Websites & Internet
FOR VIJAY MARIE COLLEGE OF NURSING

Resource Person

Chhama Kumari
Msc CS (AI & ML)

Resource Person

Joyce Richard
Msc CS (AI & ML)

Coordinators
Dr. Sr. Sujatha Yeruva
Head of the Dept, Associate Professor
Ms. B. Jyothi Reddy
Asst. Professor, PG coordinator
Ms. Padmashree Josyula
Asst. Professor

11-18 JULY 2025 02:00 pm - 5:00 pm VIJAY MARIE COLLEGE OF NURSING

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Resource Person

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Resource Person

Gayatri
Msc CS (AI & ML)

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C@NNECT 8.2
Organizes
SMART SKILLS FOR SMART NURSING
Session - IV
On
MS Access & Report Generation
FOR VIJAY MARIE COLLEGE OF NURSING

Resource Person

M. Greeshmaja
Msc Data Science

Resource Person

P. Srihari
Msc Data Science

Coordinators
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SMART SKILLS FOR SMART NURSING
Session - III
On
Multimedia & Computer Aided Teaching
FOR VIJAY MARIE COLLEGE OF NURSING

Resource Person

A. Varshitha
Msc Data Science

Resource Person

C.S. Rachel
Msc Data Science

Coordinators
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Head of the Dept, Associate Professor
Ms. B. Jyothi Reddy
Asst. Professor, PG coordinator
Ms. Padmashree Josyula
Asst. Professor

11-18 JULY 2025 02:00 pm - 5:00 pm VIJAY MARIE COLLEGE OF NURSING



Smart Skills For Smart Nurses

Venue: Vijay Marie Nursing School, Chintal, Saifabad, Dates: 11th July to 14th July 2025

Resource Persons: T. Srihitha, Joyce Richard, Gayatri, Chhama Kumari. A two-day digital literacy workshop was conducted at Vijay Marie Nursing School, Chintal, Saifabad, aimed at equipping nursing students with essential technological skills. The sessions focused on helping students become comfortable with basic internet usage, word processing, and email communication—skills increasingly necessary in today's healthcare and academic environments.

Day 1 – 11th July : Internet Basics & Microsoft Word

The first session focused on introducing students to the basics of the internet — including browsers, search engines, and website navigation. This was followed by a hands-on session on Microsoft Word, where students were guided through creating, editing, and formatting documents.

Day 2 – 14th July (Monday): Gmail and Email Communication

The second day covered email literacy, starting with an explanation of Gmail, its interface, and key features. Students were taught the difference between formal and informal emails, followed by a demonstration on how to create a Gmail account, compose an email, and send/receive messages.



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DEPARTMENT OF COMPUTER SCIENCE

C@NNECT 8.3

IoT Frontier Designing Smart Solutions for the Future



RESOURCE PERSON

MR. RAVI TEJA

FOUNDER & MANAGER
TEJASIA INNOVATIVE
SOLUTIONS AND PVT LTD.



28TH -30TH JULY 2025. || 9:00 AM-2:00 PM



COMPUTER LAB 6

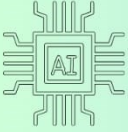
For MSc AI & ML II Year



Series of IoT Workshop

The Department of Computer Science organized C@nnect 8.3, A series of IoT workshop for M.Sc. 1st year Data Science and AI & ML students on 25th June 2025 to 31st July 2025. The number of students attended were around 40.

The resource person was Mr. Ravi Teja. The training covered sensor working principles, coding concepts, and hardware integration for real-world IoT applications. The sessions were structured to gradually build skills from basic sensors to advanced modules, ensuring a strong foundation in IoT development. The students learnt about the Moisture Sensor (used to measure soil moisture levels), Flame Sensor (for fire detection), and LDR Digital Sensor (Light Dependent Resistor, used to measure light intensity) and PS Module (for location tracking), Gyroscope Sensor (for motion and orientation detection), RFID (Radio-Frequency Identification), Ultrasonic Sensor (USS) for distance measurement, DHT Sensor (for temperature and humidity monitoring), and LCD Display for output visualization. Each module was tested and programmed during hands-on practice sessions. By the end of the sessions, participants were able to connect, program, and test multiple IoT devices, preparing them to design and implement real-world IoT applications effectively.






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DEPARTMENT OF COMPUTER SCIENCE

Organizes
@NNECT 8.5

SKILL DEVELOPMENT TRAINING PROGRAM

IN ASSOCIATION WITH MAGIC BUS INDIA FOUNDATION

Resource person



TANAYA
Trainer-Magic Bus India Foundation

TECH FUNDAMENTALS ON AZURE, AI & EMPLOYABILITY SKILLS PROGRAM

14th JULY 2025- 10th October 2025.

2 pm-4.30 PM

Computer Science Lab

Coordinators

Dr.Sr.Sujatha Yeruva
Head of the Dept, Associate professor

Ms.B.Jyothi Reddy
Asst.Professor, PG coordinator






Skill Development Training Programme

The Department of Computer Science has formalized a Memorandum of Understanding (MoU) with the Magic Bus India Foundation, a reputable non-profit organization, aimed at enhancing students' proficiency in Azure Technology Fundamentals, Artificial Intelligence, and Cybersecurity.

As part of this collaboration, students participated in a series of comprehensive and engaging sessions on Microsoft Azure. The program commenced with an introduction to cloud computing, where Ms.Tanaya highlighted its growing significance in the digital era. She elaborated on key benefits such as scalability, cost-efficiency, accessibility, and data security. Participants were introduced to the primary categories of cloud services: Infrastructure as a Service (IaaS), Platform as a Service (PaaS), and Software as a Service (SaaS). Real-world examples accompanied these concepts, facilitating a clearer understanding of their practical applications. The session concluded with an in-depth overview of Microsoft Azure's architecture and its core services, including virtual machines, databases, and storage solutions.

FACULTY ACHIEVEMENTS

FACULTY ACHIEVEMENTS

Ms. B.Jyothi

Asst. Professor,

Dept. of Computer Science

Completed the Course Cybersecurity– Basic Course organized by Teaching Learning Center(TLC),IIT Madras

**CERTIFICATE OF COMPLETION****CAPACITY BUILDING PROGRAMME ON CYBERSECURITY**

This is to certify that Mrs. Jyothi Reddy B from St. Francis College for Women has completed the Capacity Building Programme on Cybersecurity – Basic Course organized by Teaching Learning Centre (TLC), IIT Madras and conducted by IITM Pravartak during 23 to 27 June, 2025.

The program is under the aegis of Ministry of Education, Govt of India, through Malaviya Mission Teacher Training Programme.

Director/Coordinator (MM-TTC)

FACULTY CONTRIBUTION

FACULTY CONTRIBUTION

Ms. Padmashree

Asst. Professor

Dept. of Computer Science

Ms. Padmashree was the resource person for the Panel Discussion On AI in Command: Ethics, Autonomy and Accountability on 20th June, 2025 organised by American Corner at St. Francis College for women.



PANEL DISCUSSION ON AI IN COMMAND: ETHICS, AUTONOMY, AND ACCOUNTABILITY



Mr. Vamshi
MBA, IIM Ranchi,
Big4 Consultant



Ms. Padmashree
Asst. Professor
St. Francis College for Women



Mr. Rakesh Dubbudu
Founder & CEO
FACTLY



Moderator

Ms. Melissa Nandula
Amspaces Programming Coordinator
U. S. Consulate General Hyderabad



20th June 2025
11:15 am - 12:15 pm



St. Francis College for Women
Capitanio Hall

Ms. Afeefa

Asst. Professor

Dept. of Computer Science

Ms. Afeefa was the resource person for the Faculty Enrichment Program 2025-26 on "Beyond Borders: SUSI Scholarship & IVLP on 15th July, 2025 organised by Faculty Development cell & IQAC.





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4 QUALITY EDUCATION
SUSTAINABLE DEVELOPMENT GOALS
SFC supports SDG

FACULTY DEVELOPMENT CELL & IQAC

Resource Person **organises** *Resource Person*

FACULTY ENRICHMENT PROGRAM 2025-26

Session - I
on



Mr. K. Ravi Kumar
Asst. Professor,
HOD-Mass Communication



Ms. Afeefa Noorain
Asst. Professor,
Dept. of Comp. Science

Beyond Borders : SUSI Scholar & IVLP

For all B.Sc. Faculty

Coordinator : Ms. P.V.S. Lakshmi
Faculty Development Cell



15th July, 2025



9:30 am



MBA Seminar Hall

STUDENT ACHIEVEMENTS

STUDENT ACHIEVEMENTS

Ms. Chhama Kumari

Ms. Joyce Richard

Msc AI & ML

Resource person for Smart skills for smart Nursing session on
“Accessing websites & internet” at Villa Marie College for Nursing


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**SUSTAINABLE
DEVELOPMENT
GOALS**
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DEPARTMENT OF COMPUTER SCIENCE

Organizes

SMART SKILLS FOR SMART NURSING

Resource Person



Chhama Kumari
Msc Cs(AI&ML)

Session - I
On

Accessing Websites & Internet

FOR VIJAY MARIE COLLEGE OF NURSING

Resource Person



Joyce Richard
Msc Cs(AI&ML)

Dr. Sr. Sujatha Yeruva
Head of the Dept, Associate Professor

Ms. B. Jyothi Reddy
Asst. Professor, PG coordinator

Ms. Padmashree
Asst. Professor



11-18 JULY 2025



02:00 pm - 5:00 pm



VIJAY MARIE COLLEGE OF NURSING

Ms. Srihita

Ms. Gayatri

Msc AI & ML

Resource person for Smart skills for smart Nursing session on
“Use of Internet and Emails” at Villa Marie College for Nursing

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**4 QUALITY EDUCATION**

**SUSTAINABLE DEVELOPMENT GOALS**
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DEPARTMENT OF COMPUTER SCIENCE

Organizes
SMART SKILLS FOR SMART NURSING

Resource Person



Srihita
Msc Cs(AI&ML)

Session - II
On

Use of Internet & Email

FOR VIJAY MARIE COLLEGE OF NURSING



Gayatri
Msc Cs(AI&ML)

Coordinators

Dr. Sr. Sujatha Yeruva
Head of the Dept, Associate Professor

Ms. B. Jyothi Reddy
Asst. Professor, PG coordinator

Ms. Padmashree
Asst. Professor

 **11-18 JULY 2025**

 **02:00 pm - 5:00 pm**

 **VIJAY MARIE COLLEGE OF NURSING**

Ms. A. Varshitha

Ms. C. S. Rachel

Msc Data Science

Resource person for Smart Skills for Smart Nursing session on

“Multimedia and Computer Aided teaching” at Villa Marie College for Nursing



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**SUSTAINABLE
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C@NNECT 8.2

Organizes

SMART SKILLS FOR SMART NURSING

Resource Person



A.Varshitha
Msc Data Science

Session - III
On

Multimedia & Computer Aided Teaching

FOR VIJAY MARIE COLLEGE OF NURSING

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C.S. Rachel
Msc Data Science

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Ms. Padmashree Josyula
Asst. Professor



11-18 JULY 2025



02:00 pm - 5:00 pm



**VIJAY MARIE COLLEGE OF
NURSING**

PG INTERNSHIP 2024-2025

Ms. M. Greeshmajha

Ms. P. Srikari

Msc Data Science

Resource person for Smart Skills for Smart Nursing session on
“MS Access and Report Generation” at Villa Marie College for Nursing

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Organizes

Resource Person SMART SKILLS FOR SMART NURSING Resource Person

Session - IV
On

MS Access & Report Generation

FOR VIJAY MARIE COLLEGE OF NURSING

**M. Greeshmajha**
Msc Data Science

**P. Srikari**
Msc Data Science

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 **11-18 JULY 2025**

 **02:00 pm - 5:00 pm**

 **VIJAY MARIE COLLEGE OF
NURSING**

FACULTY ARTICLES

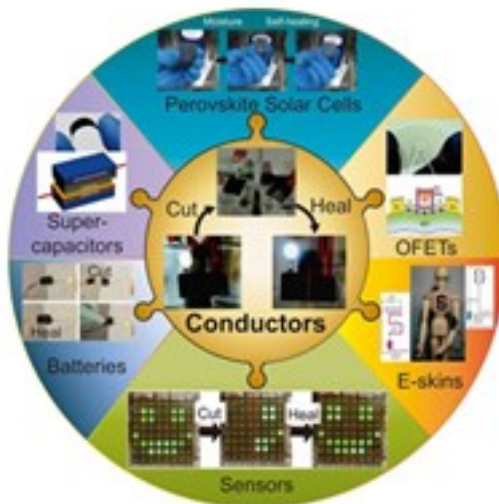
SMART MATERIALS

Smart materials, especially those that can heal themselves, are a fascinating breakthrough inspired by nature's ability to repair. Imagine a material that, like our skin, can detect damage—such as a crack—and fix itself without needing any help. Some smart materials contain tiny capsules filled with a healing substance that gets released exactly when the material breaks. Others have built-in chemical bonds that can reconnect when heated or exposed to light, basically knitting themselves back together.

What's really exciting is how this technology is starting to change the way we think about things like buildings, cars, or even gadgets. Instead of constant repairs or replacements, these materials can save time and money by extending their lifespan and keeping us safer. For example, self-healing concrete could fix small cracks before they grow into costly problems, and electronics could last longer without performance loss.

I find it incredible how scientists are blending chemistry, biology, and engineering to create materials that behave almost like living things. This kind of innovation has huge potential not just for industries but for everyday life, making everything around us smarter and more durable.

Dr. Sr. Sujatha Yeruva
M.Sc., Ph.D.
Head, Dept of Computer
Science



"Technology is anything that wasn't around when you were born."

— Alan Kay

PREDICTIVE ARTIFICIAL INTELLIGENCE

Predictive AI uses statistical analysis and machine learning for analyzing vast amounts of previous data and to recognize different patterns, allowing it to predict future events. It takes past data (historical) and uses statistical or machine learning techniques to make educated guesses about future events or trends. Predictive AI is used across industries, from finance for stock market predictions to healthcare for predicting disease outbreaks or patient outcomes to marketing to understand consumer preferences and behavior organizations, analysts used predictive analytics to inform data-driven decisions. Predictive AI technology has fast tracked this process, increasing the accuracy of statistical analysis by leveraging vast amounts of data that machine learning algorithms can access. By analyzing thousands of variables and sometimes decades of historical data, predictive AI can generate insights that help organizations anticipate future trends and make more informed decisions. Predictive AI is often mistaken for descriptive or prescriptive analytics. Descriptive analytics focuses on explaining past events, while predictive analytics aims to forecast future outcomes. Predictive AI is extensively employed to understand customer behavior and improve decision-making in various industries. It can forecast a range of events, such as customer turnover, supply chain issues, or equipment malfunctions, allowing for proactive planning through accurate and dependable predictions.

The three key elements are Data, Algorithms, and Predictions. Each is essential for converting raw data into actionable predictive insights.

Data is the foundation of AI-driven predictive analytics. Without data, even the most sophisticated AI models are useless, like an engine without fuel. This data can be structured, such as numbers and categories, or unstructured, like text and images. For predictive analytics to work well, the data must be thorough, precise, and relevant. It goes through steps like cleaning (correcting errors or inconsistencies) and pre-processing (formatting the data so it's compatible with algorithms).

Algorithms are the core decision-making components of AI predictive analytics. They are intricate mathematical models that analyze data to generate predictions. These algorithms can vary from basic models, like linear regression, to advanced deep learning networks, depending on the task's complexity and the data involved.

Predictions are the practical insights gained by analyzing and interpreting data using selected algorithms. These predictions can appear in different forms, such as forecasting upcoming trends, categorizing data points, or detecting potential outliers.



D. Sowjenya
Assistant Professor
Dept. of Computer Science



"It's not a faith in technology. It's faith in people."

— Steve jobs

HYPERAUTOMATION AND CLOUD ROBOTICS

In today's rapidly evolving digital landscape, hyper-automation and cloud robotics have emerged as transformative technologies revolutionizing the way businesses operate.

Hyper-automation refers to the use of advanced technologies—such as artificial intelligence (AI), machine learning (ML), robotic process automation (RPA), and data analytics—to automate complex business processes beyond simple tasks. It enables organizations to streamline workflows, reduce human intervention, and improve decision-making speed and accuracy. Unlike traditional automation, which focuses on individual tasks, hyper-automation connects multiple systems and tools into an intelligent, end-to-end automated environment. This leads to faster operations, cost reduction, and enhanced productivity. Cloud robotics, on the other hand, integrates robotic systems with cloud computing infrastructure.

This allows robots to access powerful computational resources, real-time data, and shared knowledge bases stored in the cloud. As a result, robots become more adaptable, scalable, and intelligent. For instance, cloud-connected robots in warehouses can optimize their routes, learn from each other, and receive instant updates. In healthcare, cloud robotics enables remote surgeries, rehabilitation assistance, and automated delivery of medical supplies.

Together, these technologies are changing industries such as manufacturing, logistics, healthcare, and retail. By combining hyper-automation with cloud robotics, companies can create highly responsive and autonomous operations. For example, a factory using cloud-powered robots and hyper-automated systems can automatically detect supply shortages, place orders, and adjust production in real time.

However, with such advancements come challenges like data privacy, cybersecurity risks, and the need for reskilling workers. Organizations must adopt robust strategies to handle these risks while ensuring ethical and responsible deployment.

In conclusion, hyper-automation and cloud robotics represent the future of intelligent enterprise operations. By embracing these technologies, businesses can achieve unprecedented efficiency, agility, and innovation—paving the way for a smarter and more connected world.



Preethi Geetla
Assistant Professor
Dept. of Computer Science



*"Technology, like
art, is a soaring
exercise of the hu-
man imagination."
— Daniel Bell*

THE EVOLUTION FROM PREDICTIVE AI TO AGENTIC AI:

Introduction

For decades, artificial intelligence (AI) systems have largely operated as tools, remarkably advanced, but ultimately reactive. They could predict outcomes, complete sentences, and even diagnose diseases, but only when prompted. These systems, known as predictive AI, marked significant technological progress but lacked true autonomy. Today, we stand at the edge of a profound transformation: the rise of Agentic AI. These are systems not just capable of predicting, but of acting, setting goals, making plans, executing tasks, and adapting in real time. This shift represents a paradigm change in how we understand, design, and interact with AI.

Predictive AI: Predictive AI refers to systems that leverage historical data and statistical models to forecast future outcomes. It powers technologies like:

- Recommendation engines (e.g., Netflix, Spotify),
- Language models (e.g., autocomplete, chatbots),
- Medical diagnosis systems,
- Fraud detection systems.

These systems are reactive. They respond to inputs but do not act unless prompted. Even advanced language models like GPT-3 and early versions of GPT-4 could generate impressive text, but had no agency, they couldn't set goals, reflect on outcomes, or act without user instructions. Image src: <https://www.jeda.ai/resources/why-multimodal-ai-agents-will-dominate-enterprises-and-startups-with-jeda-ai>

Agentic AI: Agentic AI systems are designed with agency, meaning they:

- Set and pursue goals independently,
- Learn and adapt in dynamic environments,
- Break down high-level objectives into sub-tasks,
- Collaborate with other agents or humans,
- Decide when and how to act, often without direct prompting.

Imagine an AI that not only writes code, but also:

1. Detects when a bug appears in your app,
2. Diagnoses the issue,
3. Fixes the bug,
4. Notifies you of the update—without being asked.

This is not speculative. With emerging frameworks like Auto GPT, Baby AGI, and openAI's function-calling tools, such autonomous workflows are becoming real.



B. Jyothi
Assistant Professor
Dept. of Computer Science

*"Artificial intelligence
is the new
electricity."*

— Andrew Ng

Key differences

Feature Predictive AI Agentic AI		
Input-driven behavior	Yes	No (can self-initiate tasks)
Goal orientation	None	Yes (can generate and pursue goals)
Memory and feedback use	Minimal or none	Actively updates based on feedback
Autonomy level	Low	High
Real-world application	Passive assistance	Proactive problem-solving

The Need for a Paradigm Shift

1. **Autonomy Redefines Human-AI Interaction:** Instead of users constantly giving commands, agentic AI can proactively assist, like a colleague, not a tool.
2. **New Frontiers in Productivity:** Businesses and researchers can offload entire processes to AI agents: managing schedules, conducting market analysis, debugging code, or even running experiments.
3. **Complex Coordination Becomes Possible:** Agentic AI enables multi-agent systems to collaborate, simulating economies, political systems, or distributed workflows.
4. **Risks and Ethics Take Center Stage:** With autonomy comes the challenge of alignment: ensuring AI goals match human intentions. Misaligned agents could cause harm, even without malicious intent.

Challenges Ahead

- ☐ Control and Oversight: Who is responsible for an agent's decision?
- ☐ Goal Misalignment: How do we prevent unintended outcomes?
- ☐ Security Risks: Autonomous systems can be exploited or manipulated.
- ☐ Trust and Transparency: Agentic AI must be interpretable to humans.



"I think it's a huge mistake to just take what worked on a previous generation and keep repeating it, instead of questioning it."

— Elon Musk

BLOCKCHAIN IN FINANCE: REVOLUTIONIZING THE FINANCIAL LANDSCAPE

Blockchain technology has emerged as one of the most disruptive innovations in the financial sector, transforming traditional systems by enhancing security, transparency, and efficiency. Originally developed as the foundation for cryptocurrencies like Bitcoin, blockchain has expanded its reach far beyond digital currencies and is now being actively explored and adopted across various financial services. At its core, blockchain is a decentralized, distributed ledger that records transactions across a network of computers. Each transaction is verified by network participants, cryptographically secured, and added to a chain of previous transactions. This structure ensures immutability, transparency, and real-time access to financial data, making it highly attractive for financial institutions.

One of the most significant applications of blockchain in finance is cross-border payments. Traditional international payments involve multiple intermediaries, resulting in high costs and delayed settlements. Blockchain eliminates these intermediaries by enabling peer-to-peer transactions, allowing near-instant transfers at a fraction of the cost. Platforms like Ripple and Stellar have already demonstrated how blockchain can streamline global remittances. Another transformative area is Decentralized Finance (DeFi). Built on blockchain networks like Ethereum, DeFi provides financial services such as lending, borrowing, and trading, eliminating the need for traditional banks or brokers. Smart contracts—self-executing programs that run on blockchain—automate and enforce agreements, reducing operational risks and increasing efficiency. Asset tokenization is also gaining traction. Real-world assets, such as stocks, bonds, or real estate, can be represented as digital tokens on a blockchain, enabling fractional ownership and facilitating easier transferability. This has the potential to democratize access to investments and improve market liquidity.

Furthermore, blockchain enhances compliance and auditability. Financial records stored on the blockchain are tamper-proof and timestamped, enabling regulators and auditors to verify transactions in real-time. Despite its promise, blockchain in finance faces challenges such as regulatory uncertainty, scalability issues, and integration with existing legacy systems. However, as regulatory frameworks evolve and technology matures, blockchain is expected to play a central role in shaping the future of finance.

In conclusion, blockchain offers a powerful foundation for a more inclusive, efficient, and secure financial system. Financial institutions that embrace this technology are likely to lead the way in the digital transformation of global finance.



R. Srivalli Sumalatha
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"Computers are incredibly fast, accurate, and stupid; humans are incredibly slow, inaccurate, and brilliant; the marriage of the two is a thriving business."

— Albert Einstein

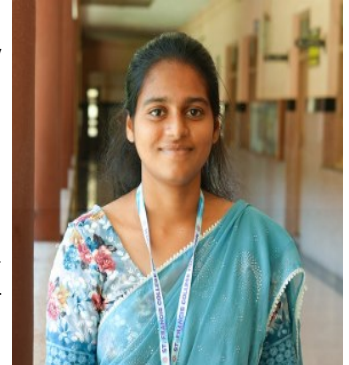
HOW EXPLAINABLE AI (XAI) IS CHANGING DECISION-

Artificial Intelligence is increasingly being used to make decisions in essential fields such as healthcare, finance, and law. However, a major concern persists—can we rely on decisions that are not transparent?

This is where Explainable AI (XAI) plays a crucial role.

XAI aims to enhance the transparency and interpretability of AI systems. It enables users to comprehend how an AI model arrived at a specific decision, which facilitates greater trust in and acceptance of the results. For instance, if an AI refuses a loan application, XAI can clarify that the reason was a low credit score or insufficient income—rendering the process more equitable and understandable. A significant benefit of XAI is the boost in trust. When individuals grasp the reasoning behind decisions, they are more inclined to depend on AI. In the field of healthcare, physicians can utilize XAI tools to interpret how an AI identified a disease from an image, increasing their confidence in its support.

XAI enhances accountability by allowing organizations to explain their decisions and rectify mistakes through the insight of feature influence on the model. It also plays a crucial role in detecting bias, particularly in critical sectors such as recruitment or evaluations of criminal risk. Methods such as SHAP, LIME, and Feature Importance are frequently employed to make sense of complex models, including neural networks and random forests. Although XAI offers advantages, it encounters various difficulties. More transparent models can occasionally yield lower accuracy. Additionally, overly simplified explanations may lead to misunderstandings. Nevertheless, due to rising regulatory demands and public calls for transparency, XAI is increasingly vital. In an AI-driven world, explainability guarantees that humans maintain authority over decision-making processes. For data scientists, XAI is not merely a tool; it represents progress toward creating ethical and accountable AI systems.



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"The internet is becoming the town square for the global village of tomorrow."

— Bill Gates

ARTIFICIAL WOMBS: THE FUTURE OF CHILDBIRTH

Artificial womb technology, also known as ectogenesis, represents a ground breaking shift in reproductive science. Researchers are now advancing toward the possibility of growing human fetuses entirely outside the human body. This development could revolutionize childbirth, fertility, and neonatal care, while also raising complex ethical and societal questions. An artificial womb is a device that can support the development of a fetus outside the human body by replicating the conditions of a natural uterus. It maintains a sterile, temperature- controlled environment and supplies oxygen and nutrients through an artificial placenta or umbilical cord system. The idea is to bridge the gap between in vitro fertilization and full gestation outside the body.

Applications

1. **Premature Births:** Artificial wombs could offer a safer alternative for extremely premature infants (born before 28 weeks), reducing complications associated with incubators.
2. **Infertility and Surrogacy:** Individuals unable to carry pregnancies—due to medical, biological, or gender identity reasons—could use artificial wombs as an alternative to surrogacy.
3. **Space Colonization & Harsh Environments:** In extreme conditions where human pregnancy is risky or impossible, ectogenesis might support population sustainability.
4. **Research and Development:** Artificial wombs could aid in embryonic development research without risking the health of a human mother or fetus.

Ethical and Social Considerations

The possibility of gestating human life entirely outside the body provokes significant ethical questions:

- ☐ Parental Roles
- ☐ Regulation and Access
- ☐ Consent and Rights

Bioethicists stress the importance of setting clear legal and ethical frameworks before the technology becomes viable for human use.



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*"Technology is
neither good nor
bad; it's how we use
it." — Walt Disney*

FROM TEMPLATES TO AGENTS: EVOLVING PROMPT DESIGN IN AUTONOMOUS SYSTEMS

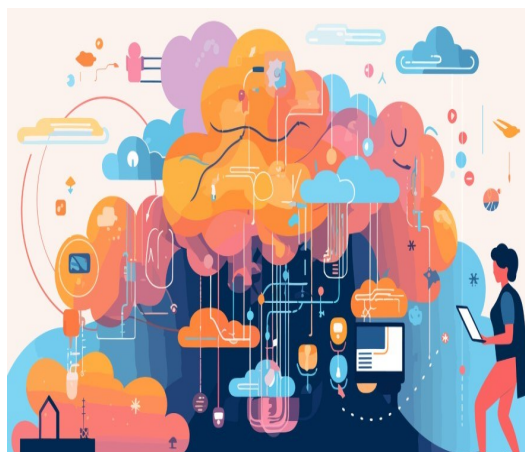
With the growing prominence of autonomous systems, prompt design has undergone a significant transformation of how we formulate prompts for AI systems. Prompting was once a system of simple, structured templates but has progressed into sophisticated agents capable of understanding and acting on intricate objectives. In the formative years, prompt design was predominantly rigid. Templates were designed with fixed inputs and outputs, providing user interaction with models like GPT through standardized language patterns. These templates were resourceful but offered minimal versatility and very little context sensitivity. They functioned efficiently for small tasks but failed in scenarios involving critical thinking, flexible response and cognitive processing.

The shift to agent-based systems ushered a crucial breakthrough. Modern prompt design calls for synchronizing more than a lone command, involving multiple tasks that includes task delegation contextual memory, tool application and feedback-driven refinement. Autonomous agents like Auto GPT and Lang Chain-based bots simulate cognitive reasoning resembling those of humans by segmenting goals into simpler components leveraging tools like search engines and databases, adjusting actions based on outcomes. Prompts have evolved beyond simple instructions within this framework — they define the behavioural patterns.

Designing prompts for agents involves outlining agent roles, targets, autonomy scope of the agent. These prompts must adapt to handle unpredictable scenarios, guaranteeing agents optimal performance. Researchers are now exploring prompt engineering techniques like ReAct (reasoning and acting) and few-shot examples to better ground agents' decisions.

This evolution also requires the need for improved ethics and risk management. As agents gain autonomy, maintaining consistency to match human objectives becomes crucial. The future of prompt design requires a balance between guidance and autonomy —crafting prompts that equip agents to analyze and respond autonomously, yet responsibly.

From static templates to intelligent agents, prompt design has become a blend of innovation and precision steering our use of AI toward its fullest potential in autonomous systems.



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"People underestimate the impact of what we have just built. I think it is more significant than the industrial revolution."

— Elon Musk

SUPPLY CHAIN MANAGEMENT USING BLOCKCHAIN TECHNOLOGY

Blockchain technology has emerged as a transformative force in supply chain management, offering enhanced transparency, traceability, and efficiency. Traditional supply chains often suffer from issues like data fragmentation, lack of visibility, fraud, and delayed communication among stakeholders. Blockchain addresses these challenges by providing a decentralized, immutable, and transparent ledger system.

In a blockchain-based supply chain, every transaction or movement of goods is recorded in real time and stored across a distributed network. Each participant, from raw material

suppliers to manufacturers, distributors, and retailers, has access to the same secure data. This level of transparency ensures accountability and helps reduce disputes, counterfeiting, and inefficiencies. One of the key advantages of blockchain in supply chains is traceability. For example, in the food or pharmaceutical industry, products can be traced back to their origin with accuracy, which is vital in case of recalls or contamination. Similarly, luxury goods can be authenticated at every step of their journey to prevent fraud.

Smart contracts—self-executing contracts with predefined rules—can automate tasks such as payments, order verifications, and compliance checks. This automation reduces human error, increases speed, and ensures all parties adhere to agreed-upon terms. Blockchain also improves trust between parties who may not know each other well, since no single party controls the data. Companies like IBM, Walmart, and Maersk have already begun integrating blockchain solutions into their supply chains, demonstrating real-world benefits such as cost reduction and improved reliability. Despite its potential, blockchain adoption still faces challenges like scalability, energy consumption (for some blockchain types), and the need for industry-wide standardization. However, as technology evolves, blockchain is expected to play a central role in building more resilient, secure, and transparent supply chains globally. Future research in blockchain for supply chains can explore interoperability across platforms and real-time tracking using IoT integration. Emphasis can also be placed on enhancing data privacy and scalability for global supply networks.



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*"Everything that can
be invented has
been invented."*

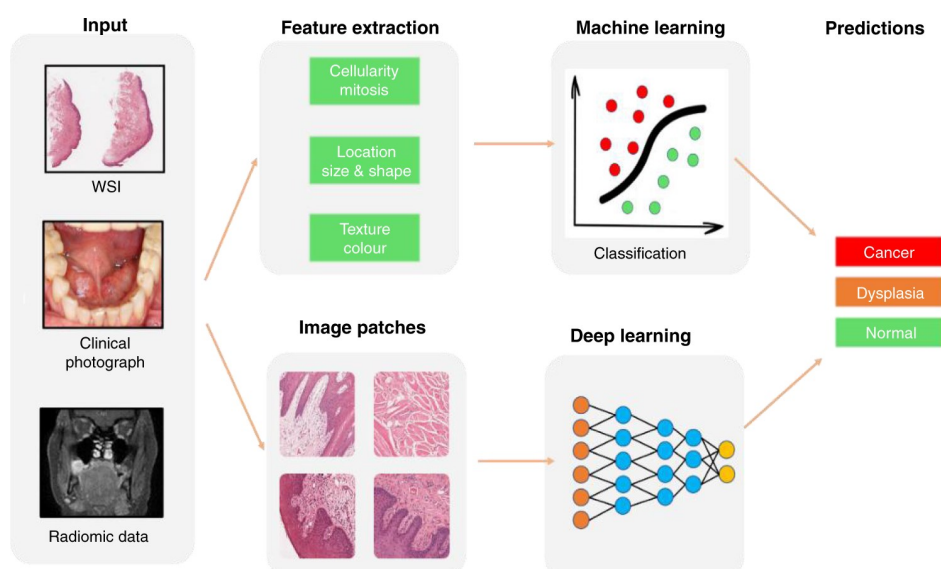
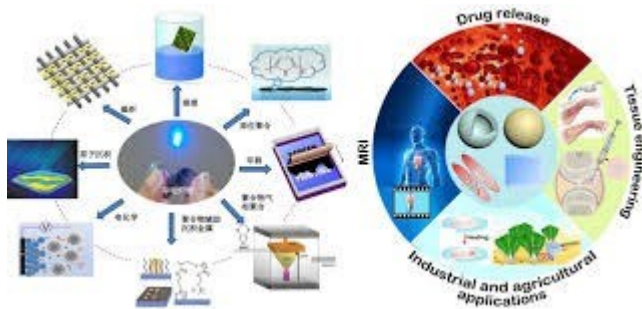
— Charles H. Duell

TREATMENT OF CANCER PATIENTS USING A DEEP LEARNING APPROACH

Cancer continues to be one of the leading causes of death worldwide. Accurate diagnosis, effective treatment planning, and continuous monitoring are critical to improving survival rates. The integration of Artificial Intelligence (AI), particularly deep learning techniques like Long Short-Term Memory (LSTM) networks and Convolutional Neural Networks (CNNs), has revolutionized cancer diagnosis and treatment. This article explores how LSTM and CNN algorithms can be applied in the treatment of cancer patients, emphasizing their capabilities in handling medical imaging, patient history, and real-time monitoring data. Cancer is a complex disease that affects millions globally. Its treatment requires personalized approaches based on the type, stage, and patient-specific factors. AI-driven models, particularly deep learning, have shown great promise in assisting doctors with accurate diagnosis, predicting disease progression, and customizing treatment plans. CNNs and LSTMs, two prominent types of deep learning models, are increasingly used in combination to leverage both spatial (image-based) and temporal (sequence-based) information from diverse data sources. CNNs are powerful for analyzing visual data. In cancer treatment, CNNs are primarily used to: Detect tumours in radiology images (MRI, CT scans, X-rays), Classify cancer types (e.g., benign vs. malignant). LSTMs are a special type of Recurrent Neural Network (RNN) capable of learning long-term dependencies in sequential data. In cancer care, LSTMs are useful for analyzing patient's treatment history, predicting disease progression over time and Monitoring patient response to therapies hybrid model combines CNN and LSTM to utilize image data and patient records together. The main benefits of using this hybrid model are to get accurate result in diagnosis, understanding the tumour growth patterns. The combination of CNN and LSTM in cancer treatment provides a powerful tool for early diagnosis, treatment customization, and monitoring. Though still an evolving area, the use of AI promises a future where cancer care is more precise, predictive, and personalized.



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**"The computer
was born to solve
problems that did
not exist before."**

– Bill Gates

CLOUD DATABASES: MODERN DATA MANAGEMENT WITH SNOWFLAKE

Cloud databases are databases that run on cloud infrastructure, providing scalable, reliable, and cost-effective data storage and processing. Unlike traditional on-premises databases, cloud databases eliminate the need for physical hardware, reduce maintenance overhead, and offer on-demand scalability.

One of the leading examples of a cloud database is Snowflake. Snowflake is a cloud-native data platform designed for data warehousing, analytics, and data sharing. It runs on popular cloud providers such as AWS, Azure, and Google Cloud, allowing organizations to choose the best infrastructure for their needs.

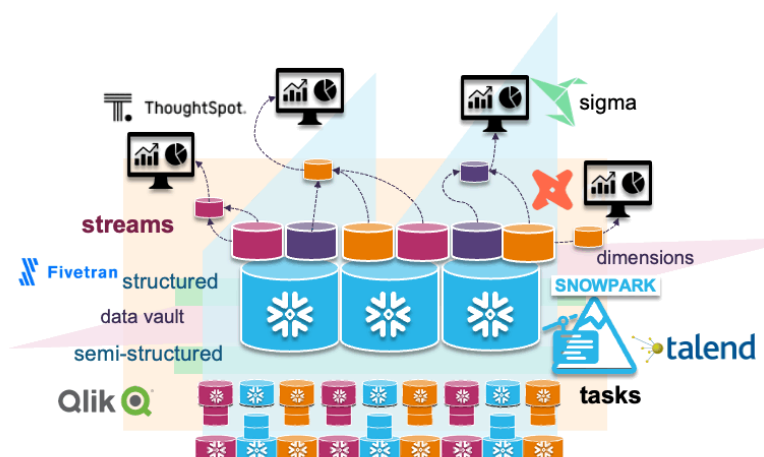
What sets Snowflake apart is its separation of storage and compute, meaning users can scale up compute resources for intensive workloads without affecting storage costs. It also supports semi-structured data formats like JSON, Avro, and Parquet, making it ideal for modern data workflows.

Snowflake enables concurrent user access with virtually no contention by allowing multiple virtual warehouses to run independently. This architecture is especially beneficial for enterprises running BI tools, ETL pipelines, and machine learning jobs in parallel.

Another powerful feature is Secure Data Sharing, which lets users share live data across accounts or organizations without copying it – a game changer for collaboration. In short, cloud databases like Snowflake offer elasticity, security, and high availability, all without the complexity of managing infrastructure. As data becomes more central to decision-making, platforms like Snowflake provide a robust foundation for modern data strategies.



Prabhmeet Kaur
Assistant Professor
Dept. of Computer Science



"Just because something doesn't do what you planned it to do doesn't mean it's useless."

– Thomas Edison

YOUR CONTENT, AI-ASSISTED: THE RULES OF PLAGIARISM IN THE AI ERA

Traditionally, plagiarism is defined as presenting someone else's work or ideas as your own without proper attribution. With AI, the definition becomes more nuanced. AI models are trained on vast datasets, including copyrighted material. When an AI generates text, it essentially reprocesses and synthesizes information from this training data.

Your content can be tagged as AI Plagiarized when you:

1. Present AI-generated content as your own content.
2. Over-use AI for paraphrasing your content.
3. Don't verify AI-generated content for fake citation and use it in your work.
4. Use same pattern or style of writing as AI-generated content.
5. Lack original thought in your AI-generated content.

How to check for AI Plagiarism?

The detection of AI plagiarism is a growing field, with tools evolving rapidly to keep pace with AI advancements. Here's how it's typically checked:

1. Use the Traditional Plagiarism checkers
2. A wide range of AI Detection tools are available online for free or licensed.
 - These tools check for:
 1. Perplexity: how Predictable the next word is
 2. Burstiness: the variation in sentence length and Structure. (Note: Human writing patterns will have higher burstiness and lesser perplexity.)
 3. Grammatical Patterns and word choices you make.
 4. Patterns in your text to check if your content's coherence and flow resemble AI-generated content.

3. Ultimately, experienced professionals and editors can often check for signs for AI-generated content in your content.

Popular AI Detection Tools:

1. Turnitin
2. Grammarly's AI Detector
3. Originality.ai
4. GPTZero
5. Copyleaks

It's important to note that no AI detection tool is 100% foolproof, and false positives can occur.

How to Correct AI Plagiarism?

If your content is flagged for AI plagiarism, here's how to correct it:

1. Be transparent and acknowledge and disclose how much % of AI content you have used.
2. Use AI as an assistant and not the author of your content.
3. Restructure the AI-generated content using your own thoughts.
4. Proofread and verify for inconsistencies in the AI-generated content.
5. Run through an AI Plagiarism Detector yourself.

In conclusion, AI is a powerful innovation that can enhance productivity and creativity. By viewing AI as a collaborative assistant rather than a substitute for human intellect and originality, you can leverage its benefits while upholding academic and ethical integrity in your content creation. Transparency, significant human input, and rigorous fact-checking are your strongest defenses against AI plagiarism.



Divya Rachala
Assistant Professor
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"The only way to do great work is to love what you do."

– Steve Jobs

STUDENT ARTICLES

HUMAN COMPUTER INTERACTION (HCI)

Human Computer Interaction (HCI) is about integrating many domains such as computer science and psychology interactions between technologies. It focuses on the activities of people, in interface design. Design, psychology, and ergonomics offer many perspectives to land on a seamless and efficient computing system. Computer science is a field of computation and information. Computer science plays a crucial role in the modern development of HCI. Smart Television, Voice assistant, AR/VR technology and gaze detection are some of the technologies that exists in the modern world, which are running our day-to-day life. HCI is all about understanding how people interact with computers in their daily lives. It blends insights from computer science, cognitive science, and human factors engineering to guide technology design. Modern technology seeks to simplify systems for the better with HCI. Computer, interface design, software, websites, or mobile application whatsoever, anything that casts user's interaction is under the giant umbrella of HCI.

Furthermore, HCI looks into gaining resolutions for technology-based problems to increase positive user experience. Usability, user experience, accessibility, interaction design, etc., are a few of these core concepts. The advancement in AI systems, voice virtual assistants, VR headsets, or even smartwatches draw from human behaviour to steer technological growth, thus contributing to the HCI arena. HCI spurs the development of technologies that uplift human productivity and make things easier to use. Usability is the word emphasized, but the design needs.



M.LIKITHA
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"The internet could be a very positive step towards education, organisation and participation in a meaningful society."

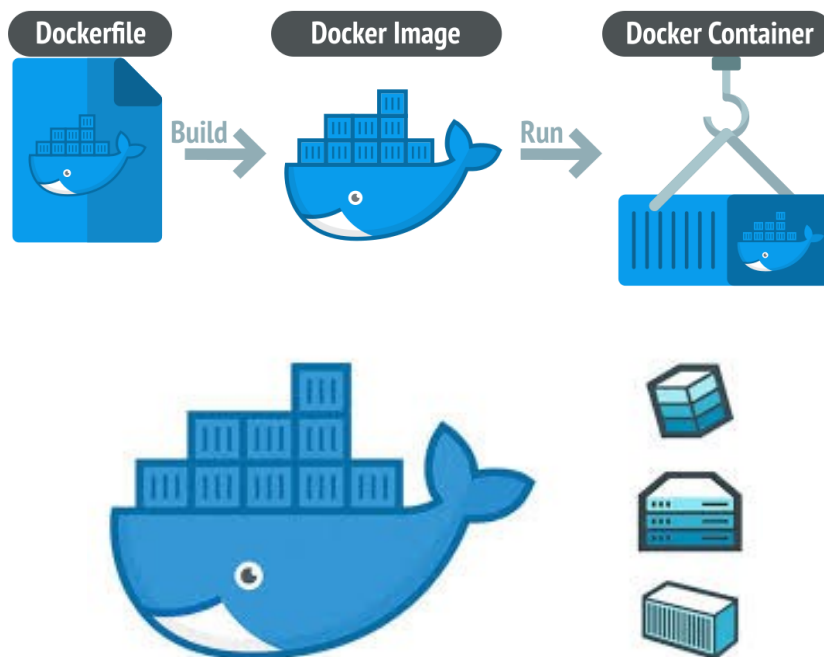
– Noam Chomsky

DOCKER- THE CONTAINER

Software engineers and developers initially faced a lot of problems while working on an application, be it testing, deploying and managing it. It used to work for the developers who coded the application but while trying to run the same thing on the server it was not working because of different libraries, operating systems, and dependencies. Now that's where Docker came into action. Docker is like a container that contains all the codes, libraries and dependencies needed for the application that is being built. It is an open-source platform that delivers software in packages. Once the docker is used in the system, anyone can work on the application in their system. Docker was released to the public in 2013 at PyCon. Solomon Hykes, the former head of Dot Cloud (which later became as Docker) came up with this amazing solution. The fact is that Docker was actually an internal project at dot Cloud to improve the development and deployment process but after its release as an open-source platform, it has made the developers lives even simpler because it ships code faster, saves money, and is an all-in-one pack.



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"We need technology in every classroom and in every student and teacher's hand, because it is the pen and paper of today."

– David Warlick

AI & ML IN MY POCKET

Long ago, AI just meant robots. And Machine Learning? Honestly, I don't know... These days, we keep hearing terms like Artificial Intelligence and Machine Learning all around us — in news, YouTube videos, and even casual conversations. Some of us even have friends in engineering learning AI and ML as part of their course. But for the rest of us, AI sounds like Chat GPT, and ML is about understanding how machines work. These words are so common now that we forget to stop and ask what they actually mean — or how much they've already become part of our lives. Think about it — ever noticed how Spotify just gets your taste in music? Or how Instagram shows you exactly what you were thinking about? That's not magic. That's AI and ML quietly doing their job. These systems watch what we do, learn from it, and try to do better. When we like, search, or swipe — the app remembers. Slowly, it starts to know about us! See, AI and ML are already living rent-free in your phone. Here's how:



YouTube – Knows your video vibe



Instagram – Suggests reels and ads based on what you do



Spotify – Recommends songs you'll probably love



Chat GPT – Helps with questions and study stuff



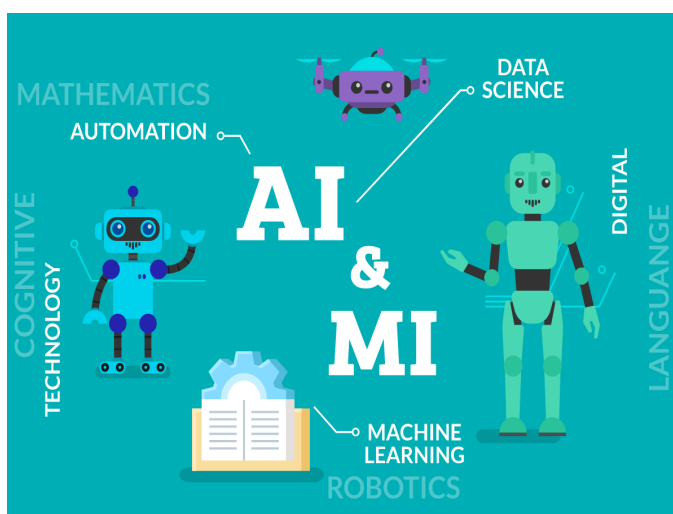
Pinterest – Shows pins that match your style and interests

So you don't need to be techie,

Just curious, clever, and a little bit cheeky.



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"Life is not measured by the number of breaths we take, but by the moments that take our breath away."

– George Carlin

TECH FOR MENTAL HEALTH

In the age of rapid development in technology, mental health issues like anxiety, burnout, social anxiety and depression are becoming more and more common. It's a good thing that technology these days has been surfacing as a powerful supporter in promoting well-being. From therapy bots that are AI-powered to meditation apps, these digital tools are helping many people to improve their mood and manage stress in their day to day life. There are many platforms such as Wysa, Calm etc that uses techniques that are backed by neuroscience and conversational AI to offer millions of users all around the world to have an affordable and accessible mental health support.

AI plays a very important role in making mental health care more flexible and personalized.

Chatbots are trained on cognitive behavioural therapy(CBT). These principles can stimulate

empathetic conversations and suggest evidence based exercises. These tools are very important in the regions with limited access to therapists or where the prejudice prevents people from searching for help. Also AI analyses speech and text patterns or even people's

facial expressions to detect any signs of emotional trouble early, enabling timely assistance.

Wearable devices like smartphone sensors or smart watches help us track and understand

mental health. They monitor sleep quality, heart rate etc and also alert users to take break

when there is a rise in stress level. These type of real-time feedback encourages every individual to build healthy habits and take good care of their mental health.

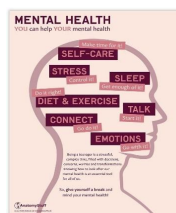
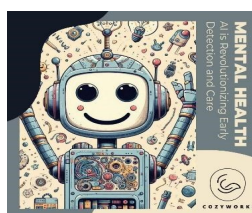
Although, as these technologies grow, they also raise questions about privacy and accuracy of diagnosis. Sensitive mental health data must be protected. While technology is

not a backup for human care, it can create new path to support .With some careful design,

technology for mental well being has the potential to transform lives of many people and make make mental and emotional wellness accessible to everyone.



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"To understand the limits of technology, one needs to understand the limits of human knowledge."

– Max Tegmark

THE GREAT FIREWALL

The Great Firewall or GFW is a combination of legislative actions and technologies enforced by the People's Republic of China to regulate the internet domestically. This plays an important role in the censorship laws that China has enforced to block internet-based content for Chinese citizens.

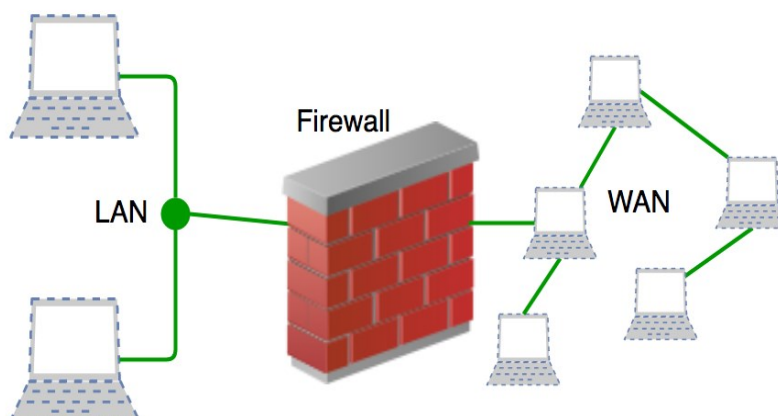
Chinese leaders understood the potential value that the internet could provide at the beginning stages of rise in internet users but they were also reluctant to potentially undermine their authority and control. To have a better control over the population's access to certain content or information that is available on the net, they directly monitor the content. By law, companies must self-censor to eliminate mention of prohibited topics.

GFW has created a market of isolated users who are left with no choice but to turn to their local alternatives to the blocked sites. Many human rights organizations have criticized China's levels of control over the resources of their citizens and how it's led to the citizen's inability to freely access information and form their own judgements.

A system such as mentioned above would not be feasible in a country like India since unlike in China, the Indian constitution has Fundamental Rights that protect the citizen's right to information. Chinese citizens cannot question their government while Indian nationals have a right to question the government if any of their actions have severe outcomes. While developing a software as above is not an impossible task for the Indian government, the constitutional rights do not allow execution of such projects.



By Anushka Shastri
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"People underestimate the impact of what we have just built. I think it is more significant than the industrial revolution."

– Elon Musk

TINYML: THE FUTURE OF SMALL-SCALE ARTIFICIAL INTELLIGENCE

In the rapidly evolving world of Artificial Intelligence, much of the focus tends to be on large-scale models and powerful cloud-based systems. However, there's a quiet revolution taking place at the opposite end of the spectrum—one that is smaller, faster, and closer to the user. This revolution is known as **TinyML**—short for Tiny Machine Learning. It represents a fascinating shift where machine learning models are being designed to run on tiny, ultra-low-power devices like microcontrollers and edge sensors. These are the same small chips commonly found in household gadgets, fitness trackers, and home automation systems.

Unlike traditional AI systems that rely on high-performance GPUs and large data centers, TinyML works directly on-device. This means the AI model is embedded into the hardware itself, allowing it to process data locally without needing an internet connection. As a result, TinyML offers a perfect balance between intelligence, efficiency, and privacy. It eliminates the latency of cloud communication, reduces power consumption, and enhances user trust by keeping sensitive data on the device rather than transmitting it to remote servers.

One of the most exciting aspects of TinyML is its potential to bring AI into areas where cloud computing is not practical or even possible. Imagine a wearable health device that detects abnormal heart rhythms and immediately alerts the user without needing a smartphone or Wi-Fi. Or consider sensors placed in farms that monitor soil conditions in real-time and help optimize irrigation, even in remote areas with no internet access. These are not just futuristic ideas—they are real-world applications being implemented today using TinyML.

From smart agriculture and wildlife monitoring to personal health tracking and home automation, TinyML is opening doors to new possibilities. Devices can now make intelligent decisions on their own, whether it's turning off lights automatically when no one is in the room or detecting gas leaks in factories with minimal power usage. These use cases are particularly relevant in developing countries, where affordable and over-efficient technology can make a huge impact on quality of life and resource management.

Several tools and platforms are helping developers bring TinyML to life. Frameworks like **TensorFlow Lite for Microcontrollers** and platforms like **Edge Impulse** make it easier to design, train, and deploy lightweight models that fit within the memory and power limits of microchips. Hardware options like the **Arduino Nano 33 BLE Sense** have built-in sensors and are optimized for running such models, allowing even beginners to start building smart devices with minimal cost and coding experience. Of course, there are challenges. TinyML models must be extremely optimized to fit into devices with very limited memory—sometimes less than one megabyte. Most models are trained in the cloud before being deployed to devices, which means some reliance on external computing still exists. However, with continuous advancements in both software and hardware, these limitations are shrinking, and the future of TinyML is becoming increasingly powerful and independent.

In conclusion, TinyML is a fast-emerging area in artificial intelligence that proves you don't need massive systems to do smart things. By bringing machine learning directly onto small, low-power devices, TinyML is making AI more accessible, affordable, and impactful—especially in areas where traditional AI can't reach. As more industries and innovators begin to adopt this technology, it's clear that the next big thing in AI might just be incredibly small.



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"The digital revolution is far more significant than the invention of writing or even of printing."

– Douglas Engelbart

DEEP LEARNING

Deep learning is a subset of machine learning. It uses artificial neural networks to analyze complex data patterns. It is inspired by human brain where it enables machines to learn, adapt and improve. It enables in many ways like with applications in computer vision, natural language processing and speech recognition, driving innovation and accuracy in various industries. In other words we can say it is a driving force behind advancements in Artificial intelligence.

The “deep” in deep learning refers to the numerous layers within these networks and each extracting increasingly complex features from the data. So, this hierarchical processing allows deep learning models to achieve remarkable accuracy in tasks as following:

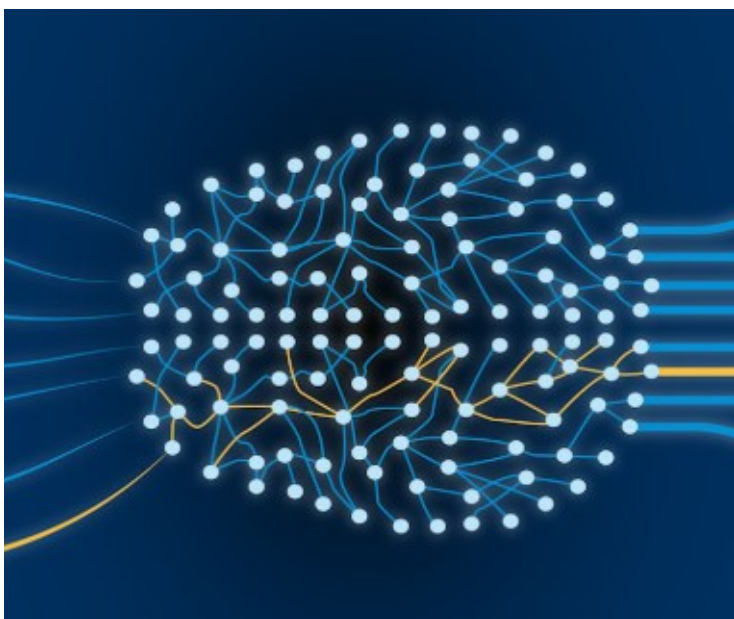
- Image Recognition: Identifying objects, faces and emotions within images and videos and applications like autonomous vehicles and security systems.
- Natural language processing (NLP): Understanding and generating human language. And also empowering virtual assistants, chatbots, translation tools.
- Speech Recognition: Converting spoken language into text, vital for voice-controlled devices and also accessibility features.

Deep learning's impact extends across various sectors, including healthcare like disease diagnosis, in finance like fraud detection and manufacturing like for example quality controlling. While requiring significant computing power and extensive data for training. Deep learning offers superior accuracy. It automatically extract features and minimizing the need for manual intervention.

As the field continues to evolve, with on going research in areas like explainable AI. Few-shot learning, deep learning promises to further reshape the technological landscape and enhance our interactions with AI systems.



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**"The internet is
the most powerful
tool for change that the
world has ever
seen."**

**– Barack
Obama**

COMPUTER VISION: TEACHING MACHINES TO SEE AND UNDERSTAND

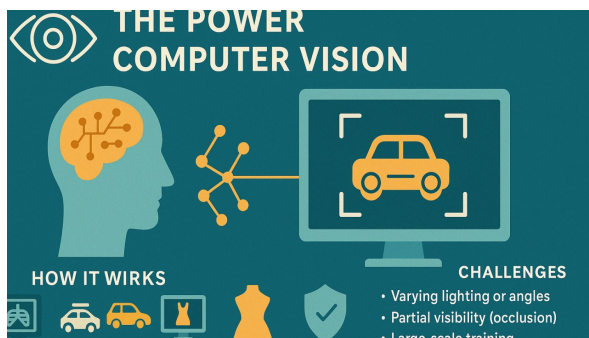
Computer Vision is a field of Artificial Intelligence (AI) that enables machines to interpret and understand visual information from the world. By using images, videos, or real-time camera input, computer vision systems can identify objects, recognize faces, track movements, and even detect emotions. It's the technology behind face recognition in smartphones, autonomous vehicles, medical image analysis, and countless other innovations.

At its core, computer vision mimics the way human vision works—seeing, processing, and responding—but with the help of algorithms and large datasets. It involves multiple steps such as image acquisition, pre-processing (like noise reduction and edge detection), object detection, classification, and sometimes real-time decision-making. Modern computer vision relies heavily on machine learning and deep learning. Convolutional Neural Networks (CNNs) are a popular model used to detect patterns in images. These networks can learn to identify features such as edges, textures, and shapes, enabling them to recognize complex objects like faces, animals, or vehicles with high accuracy.

Applications of computer vision are widespread. In healthcare, it helps detect diseases in X-Rays and MRIs. In security, it powers surveillance systems and facial recognition. In retail, it supports smart checkout systems and inventory tracking. Autonomous cars use computer vision to detect lanes, traffic signs, and obstacles, ensuring safe navigation. Challenges in computer vision include dealing with poor image quality, varying lighting conditions, object occlusion, and real-time processing demands. However, with advancements in AI, computing power, and data availability, the field is evolving rapidly. In summary, computer vision is revolutionizing how machines interact with the visual world. As it continues to improve, it holds the potential to transform industries, enhance human life, and open new frontiers in automation, robotics, and digital intelligence.



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"Technological progress has merely provided us with more efficient means for going backwards."

– Aldous Huxley

CHROME REMOTE DESKTOP & PHONE LINK

Have you ever forgotten an important file on your laptop on the very day of your presentation? Or ever wanted to access your phone while using your laptop? I have. For the complexities of the digital age, we need solutions that are just as advanced. This is where innovative technologies like **Chrome Remote Desktop** and **Phone Link** come into picture.

As the name suggests, Chrome Remote Desktop developed by Google is one such platform where a user can access their computer remotely. It uses a proprietary protocol called Chromoting to ensure secure, encrypted connections. Let's delve into how you can use it!

To set up Chrome Remote Desktop, follow these steps:

1. Prerequisites:

Make sure you have Google Chrome installed on both the computer you want to access remotely (host) and the device you'll use to connect (client). Sign in to your Google account on both devices.

2. Install Chrome Remote Desktop

On the host computer, open Chrome and visit: <https://remotedesktop.google.com/access>. Under "Set up Remote Access," click Download to get the Chrome Remote Desktop extension. Follow the prompts to add the extension to Chrome and download the required installer if prompted.

1. Configure Remote Access

After installation, open the extension and choose a name for your computer. Set a PIN (at least 6 digits) for secure access. You'll need this PIN every time you connect remotely. On Mac, you may need to grant additional permissions (Accessibility and Screen Recording) in your system preferences.

1. Accessing Your Computer Remotely

On your client device (another computer, phone, or tablet), open Chrome and go to: <https://remotedesktop.google.com/access>. Sign in with the same Google account. Select your host computer from the list and enter your PIN to connect.

Optional: Remote Support

To let someone else temporarily access your computer for support, go to: <https://remotedesktop.google.com/support>.

Click Generate Code and share it with the trusted person. They can use this code to access your computer for that session only.

Tips:

- Ensure the host computer is powered on and not in sleep mode for remote access to work reliably.
- You can also use the Chrome Remote Desktop mobile app for access from Android or iOS devices.
- This setup works on Windows, Mac, and Linux computers, provided you have Chrome installed and follow the on-screen instructions.

Continuing ahead, **Phone Link** (formerly "Your Phone") is a syncing software developed by Microsoft to connect Windows PCs to mobile devices to view notifications, make phone calls, use mobile apps amongst others, via the PC.



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"If you think technology can solve your problems, you don't understand technology and you don't understand your problems."

– Bruce Schneier

CAN A MACHINE UNDERSTAND REGRET?

Regret is a complicated deep human emotion. It involves reflecting on past decisions, considering different outcomes and feeling emotional responses often including guilt, disappointment or sorrow. As artificial intelligence develops, a key question arises: "Can a machine understand or experience regret meaningfully?"

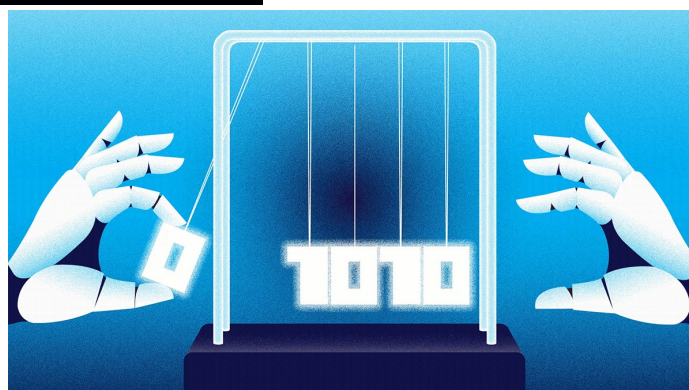
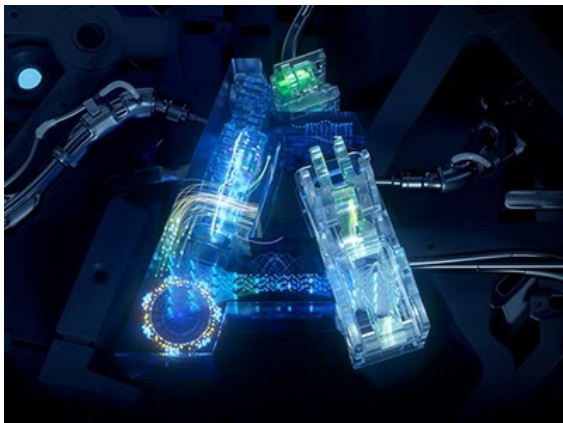
In machine learning especially in reinforcement learning, there is a concept called regret minimization. Here, an algorithm reviews its past decisions and outcomes, adjusting future actions to improve results. In this narrow, computational sense, machines show something that might look like regret, they learn from mistakes to perform better over time. However, this type of regret is purely functional and mechanical. It lacks self-awareness, emotional depth and moral context. Unlike humans, machines do not possess consciousness or a personal experience of time, memory or consequences. A robot may recognize that one choice led to a poor outcome but it does not feel the emotional weight of that decision.

For a machine to truly understand regret, it would need several human like cognitive skills like long-term memory, awareness of personal responsibility, empathy and emotional processing. These abilities are currently well beyond the capabilities of artificial intelligence as we know it. As research into Artificial General Intelligence (AGI) continues, some believe that future systems may show more advanced reflective behaviors. However, without consciousness or awareness, any display of "regret" would just be a simulation, a programmed action rather than a true emotional experience.

In conclusion, while machines can mimic regret-like processes to improve decision-making, they do not understand regret the way humans do. The emotional and philosophical aspects of regret remain uniquely human for now.



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**"A person who
never made a mis-
take never tried
anything new."**

– Albert Einstein

THE HACKATHON EFFECT

Hackathons are more than just competitions. They are incubators of innovation, leadership, and real-world problem-solving. Whether you're a seasoned developer or a curious beginner, hackathons offer a crash course in turning ideas into impact.

Every hackathon begins with a challenge, a problem waiting to be solved. Participants learn to dissect complex issues into manageable modules, often building Minimum Viable Products (MVPs) that showcase core functionality. Every hackathon demands creativity and problem solving skills from its participants.

Hackathons are a great way to learn how teams work. Since there is not much time and a lot to do, good leadership really matters. Team leaders need to figure out who is good at what, give out tasks, and keep everyone motivated. Hackathons bring out the best leader within the team and the best team among the crowd.

Participants in hackathons have the chance to learn new technologies, refine their skills, and collaborate with other experts. These events offer valuable learning experiences and contribute to professional development.

Hackathons provide a unique opportunity for companies to identify and recruit top talent. By observing participants' skills and creativity in action, companies can assess their potential as future employees.

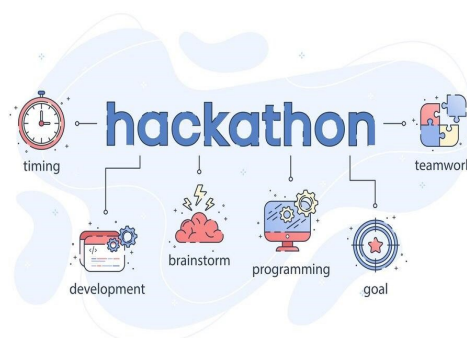
Some hackathon projects don't end when the timer stops. They evolve into startups, open-source tools, or community initiatives, helping make the world a better place. Hackathons show that with the right team and mindset, a weekend project can grow into a world-changing solution.

Hackathons are more than just coding — they're about personal growth. People leave with better projects to show, clearer career plans, and fresh confidence. They learn how to pitch ideas, present their work, and keep going when things get tough. Most of all, they realize that anyone can innovate. All it takes is passion, pressure, dedication and purpose.

Next time you hear "hackathon," remember all it takes is your passion and problem-solving mindset to make an impact.



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**"Technology
should improve
your life, not be-
come your life."**

– Billy Cox

CYBERSECURITY AWARENESS IN THE ERA OF AI

The rise of artificial intelligence (AI) has redefined how we live, work, and communicate. From virtual assistants and automated systems to AI-powered analytics, this technology is driving innovation across every sector. However, as AI continues to reshape the digital landscape, it also introduces new and sophisticated cybersecurity challenges. In this AI-driven era, cybersecurity awareness is more critical than ever.

AI offers powerful capabilities to detect and respond to cyber threats in real time. Security systems now use machine learning to identify anomalies, predict attacks, and protect sensitive data. Despite these advancements, cybercriminals are also harnessing AI for malicious purposes—creating more convincing phishing scams, automating cyberattacks, and exploiting system vulnerabilities with unprecedented speed.

One alarming case in 2024 involved a company in Hong Kong, where fraudsters used AI generated deepfake video and voice to impersonate a CEO. During a seemingly normal video call, an employee was deceived into transferring \$25 million to a fake account. This incident highlighted the dangers of AI-enhanced deception and the importance of verifying digital communications.

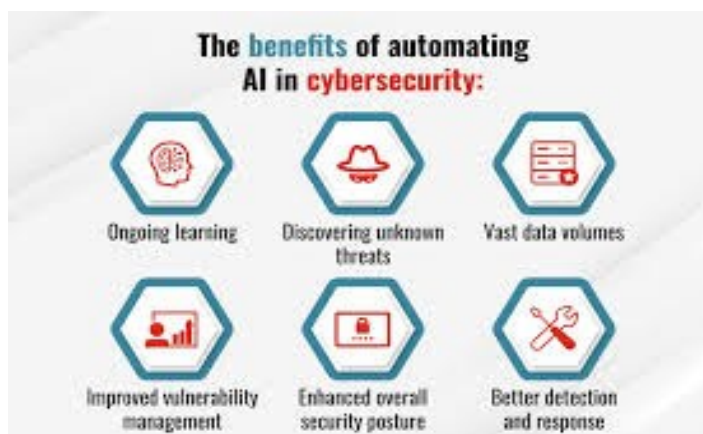
Similarly, as AI chatbots like Chat GPT become part of daily workflows, users have inadvertently exposed sensitive data. Through techniques such as prompt injection, attackers can manipulate these systems to leak confidential information or perform unintended actions. These incidents reveal a growing need for users to understand the risks associated with emerging technologies.

Cybersecurity awareness in the AI era must go beyond traditional training. Employees and individuals must be educated on how AI works, its vulnerabilities, and the safe handling of AI tools. Best practices include using multi-factor authentication, encrypting data, restricting access to critical systems, and maintaining secure backups. Organizations should also implement clear policies regarding AI usage and data privacy.

In conclusion, while AI brings significant benefits, it also increases the complexity of cybersecurity threats. Technology alone cannot ensure safety—human awareness, judgment, and responsibility play a vital role. In the era of AI, cultivating a culture of cybersecurity awareness is not just important; it is essential to building a secure digital future



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"You know you're getting old when the candles cost more than the cake."

– Bob Hope

LMS(LEARNING MANAGEMENT SYSTEMS)

Have you ever considered digitalizing the entire education system we have now? This includes everything from assigning homework to scheduling classes when a lecturer is absent. That's what an LMS is, and it's widely used across all institutes in India. So, what exactly does an LMS do? Let's explore.

LMS stands for Learning Management System. It's a software application or web-based technology used to create, manage, deliver, and assess educational courses, training programs, or learning initiatives. Educational institutions use LMS providers for remote learning.

Hyderabad's educational institutions are using LMS providers in several effective ways to facilitate remote learning for undergraduate students:

- **Centralized Content Sharing:** Institutions utilize LMS platforms like Google Classroom, MS Teams, and Moodle to share assignments, study materials, and lecture notes. This ensures students have easy, organized access to all resources, no matter where they are.
- **Real-Time Assessments and Feedback:** LMS tools allow teachers to conduct online quizzes, assignments, and exams. Automated grading and instant feedback help students track their progress and quickly spot areas for improvement.
- **Hybrid and Synchronous Classes:** Many colleges and universities offer live virtual classes and hybrid sessions through their LMS, enabling students to join in real time or access recorded lectures later. This flexibility accommodates different schedules and learning styles.
- **Gamified and Interactive Learning:** Platforms include features like Kahoot! Quizizz, and AI-driven adaptive learning tools to make remote learning more engaging and personalized. Gamification boosts motivation and helps students retain information.
- **Collaboration Tools:** LMS platforms support group projects and peer interactions through integrated tools like Google Docs, Jam board, and Slack. These features let students work together on assignments and presentations from anywhere, encouraging teamwork and digital communication skills.
- **Parental and Stakeholder Involvement:** Many institutions use LMS dashboards to keep parents informed about student progress, attendance, and upcoming assignments. This ensures transparency and support at home.
- **Data-Driven Insights:** Teachers and administrators use LMS analytics to monitor student engagement, performance, and attendance. This data helps identify students who may need extra support and guides teaching strategies.
- **Teacher Training and Professional Development:** Institutions invest in training educators to effectively use LMS and digital tools, ensuring high-quality remote instruction and ongoing professional growth.

Mobile and Multi-Platform Access: Leading LMS solutions in Hyderabad offer easy access across devices, allowing students to learn on smartphones, tablets, or computers. This further supports remote and flexible learning.

Some well-known LMS platforms include Google Classroom, Moodle, Simplilearn, and Canva.



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"The Internet is becoming the town square for the global village of tomorrow."

– Bill Gates

GREEN COMPUTING

In 2025, the technology industry is experiencing a green revolution, motivated by the stark fact that digital activities contribute 3-4% of global carbon emissions—about the same as the aviation sector. As digital transformation increases computing demands, major tech companies are rethinking their environmental impact.

Leading the Change

Amazon Web Services has made bold commitments, with 90% of its energy coming from renewable sources as of early 2025. The company has invested in 18 new wind and solar projects across various regions, adding 5.6 GW of renewable capacity to speed up its goal of using 100% renewable energy.

Microsoft is breaking new ground with carbon-negative computing by designing data Centre's that use waste heat for district heating and advanced cooling systems that cut energy use by up to 30%. They also aim to make their entire supply chain carbon negative by 2030.

Google has reached carbon neutrality for its operations and aims to achieve carbon-free energy around the clock by 2030. Their custom servers and machine learning algorithms help optimize energy use across their global network in real time.

Beyond Infrastructure

Green computing goes beyond data Centre's to include software development. Companies are adopting "green coding" practices—creating more efficient algorithms that use less computing power. This involves optimizing database queries, lowering memory use, and designing applications that require fewer resources.

This shift is more than just environmental responsibility; it is becoming a competitive edge. Energy-efficient computing lowers operating costs while meeting the rising demand for sustainability from consumers and investors. As one industry leader said, "Green computing isn't just good for the planet—it's good for business."

The blend of environmental need and economic benefit is driving the biggest change in computing infrastructure since the internet began.



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**"Innovation is
the outcome
of a habit, not
a random act."**

**– Sandeep
Khosla**

WHY SOME DISEASES ARE A PERFECT MATCH FOR MACHINE DIAGNOSIS

"AI is not here to replace doctors, it's here to give them superpowers."

Dr. Anthony Chang, Pediatric Cardiologist and AI in Medicine advocate

In today's rapidly evolving world, one question keeps echoing through hospitals, labs, and classrooms alike: **Which diseases are a perfect match for AI and why?**

AI shines brightest where the data is rich, the patterns are consistent, and the connection between input and diagnosis is clear. And when it comes to **medical imaging**, AI becomes a game-changer. Diseases like **cancer, tuberculosis, pneumonia, diabetic retinopathy, and Alzheimer's** rely heavily on medical scans and visuals. With access to massive labeled image datasets and the power of Convolutional Neural Networks (CNNs), AI can spot patterns that even trained eyes might miss. It does so swiftly, accurately, and tirelessly.

But the potential doesn't stop there.

Diseases like **cardiovascular conditions and diabetes**, which come with years of structured health data, also make an ideal match. Here, AI models like Random Forest, XGBoost, and LSTM dig deep into complex datasets, uncovering warning signs and forecasting future risks. In a major study conducted on a high-risk population in eastern China, Random Forest achieved an AUC of **0.787** in predicting cardiovascular disease. It is a powerful reminder of what becomes possible when data meets intelligence.

And then there's the cutting edge. **Genomic and molecular-level diseases** are conditions where early signs are buried deep within our DNA or cellular structures, far beyond the reach of the naked eye. AI brings the power to decode this complexity, analyzing large-scale omics data in ways that would take humans years.

However, AI isn't perfect.

There are still areas where it falls short. Some cases demand a gentle touch, a clinical eye, or a deep understanding of human context. Conditions that involve vague symptoms, require physical examination, or hinge on personal nuance are not AI's domain. And that is completely fine. Medicine was never meant to be just data points. It is a human endeavor, and AI exists to **amplify** that humanity, not replace it.

The real magic of AI in medicine lies not just in faster diagnosis but in **early detection, in prevention, in possibility**. Imagine a world where an illness can be caught by a subtle change in your voice. Imagine a wearable device predicting a heart attack before the first chest pain. That world isn't science fiction. It is rapidly becoming reality.

So no, AI isn't here to take over healthcare. It is here to **elevate it**.

It is here to make doctors faster, sharper, and more informed. It helps patients get answers sooner. And it pushes medicine into a future where the focus isn't just on curing illness but **stopping it before it starts**.

The smartest medicine of tomorrow will not rely on machines or doctors alone. It will be a powerful partnership between human intuition and artificial intelligence. And that future is already unfolding.



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"The world needs people who think and understand deeply, people who ask questions and are creative and are willing to take risks."

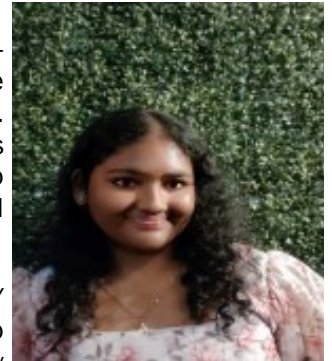
—Maria Klawe's

HACKING THE HUMAN BODY: THE RISE OF BIOHACKING

Biohacking is a revolution that combines biology, technology, and engineering in the attempt to enhance human capabilities. It can be defined as modifying or improving the human body through practices outside the traditional medical or scientific institutions. From DIY genetic experiments to the implantation of microchips, biohacking has found its way to the hearts of technologists, scientists, and even ordinary individuals who want to push the frontiers of what it means to be human. But it comes with much promise and much ethical concern on safety, regulation, and human augmentation for the future.

This encompasses many approaches that have diverse methods and aims. DIY biology encompasses genetic experiments conducted at home with tools like CRISPR, to modify DNA. Grinders enhance physical abilities with the use of implanting technology like RFID chips for contactless interaction. Cognitive biohacking includes nootropics, pills or drugs, which enable boosting brain function. Many biohackers experiment with vitamins, minerals, and smart drugs. The most extreme forms are bioelectronics and smart prosthetics, which involve humans with technology to restore or enhance physical faculties. These unifications of technology and biology have led to the development of fantastic breakthroughs including neural implants and digital wearables that monitor health metrics on a real-time basis. On the other hand, one major concern is the regulation of biohacking.

Biohacking represents an exciting prospect for human enhancement, capable of overcoming the physical limitations, cognitive abilities, and general well-being of the human being. It is, however, fraught with risks, ranging from safety to ethical dilemmas on human augmentation. As the world continues to advance in terms of technology, society must balance innovation with responsible regulation. To put it bluntly, the question is: does biohacking promise a utopian future and limitless human potential, or are there unseen challenges that shall redefine what humanness is in this new form?



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"Everybody should learn to program a computer, because it teaches you how to think."
– Steve Jobs,

CYBERSECURITY AND PRIVACY: WHY THEY MATTER

In today's digital world, Cybersecurity and privacy are no longer technical jargon—they're part of our everyday lives. Every time we go online, we leave behind data that can be tracked, collected, or even stolen. That's why protecting both our systems and personal information is more important than ever.

Cybersecurity is about defending networks and devices from hackers or cyberattacks. **Privacy**, on the other hand, is about controlling who can access our personal data and how it's used. While they go hand-in-hand, privacy needs more than just good security. It also requires transparency, trust, and ethical handling of data.

These concepts apply almost everywhere—from banking apps and hospitals to smart devices and social media. Financial systems use encryption and secure logins. Hospitals follow strict rules to protect patient data. Even everyday apps collect data like your location and preferences, sometimes more than you realize.

Tools like firewalls, AI-based monitoring, and data encryption help protect against cyber threats. But not all companies use data ethically. Some collect and sell user information through vague consent policies, feeding what's known as *surveillance capitalism*.

As threats grow, so do solutions. New methods like **zero trust security** and AI-powered defenses are becoming more common. At the same time, basic steps like using strong passwords and avoiding public Wi-Fi for sensitive tasks can make a big difference.

In the end, true digital safety comes not just from smart technology, but from smart choices—and knowing who you trust with your data.



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“If you double the number of experiments you do per year, you’re going to double your inventiveness.”

– Jeff Bezos

CRYPTOGRAPHY: SECURING INFORMATION IN THE DIGITAL AGE

Cryptography is the science of encoding and decoding information to ensure data security and privacy. It has ancient origins, with early examples like the Caesar cipher used by Roman generals. In the digital era, cryptography has become a foundational element of cybersecurity, protecting communication, financial transactions, and sensitive data from unauthorized access.

Modern cryptography relies on complex mathematical algorithms to transform plaintext into unreadable ciphertext. Only authorized users with the correct key can decrypt and access the original information. There are two main types of cryptography: symmetric and asymmetric. Symmetric encryption uses the same key for both encryption and decryption, making it fast but challenging to manage key distribution. Asymmetric encryption, such as RSA, uses a pair of keys — a public key to encrypt data and a private key to decrypt it — enhancing security for digital communications.

Cryptography underpins many everyday technologies. For example, HTTPS uses encryption to protect data sent over the internet, ensuring secure web browsing. Digital signatures, also based on cryptographic techniques, verify the authenticity of documents and software.

In recent years, advancements in quantum computing have posed potential threats to current cryptographic systems. As a result, researchers are exploring post-quantum cryptography to develop algorithms resistant to quantum attacks.

Despite its benefits, cryptography can be misused by cybercriminals to hide malicious activities. Thus, while it remains a vital tool for securing digital infrastructure, it must be balanced with responsible oversight and ethical considerations.

In conclusion, cryptography plays a critical role in protecting digital information in an increasingly connected world. As technology evolves, so too must cryptographic methods to safeguard privacy, data integrity, and trust in digital communication.



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“Technology is just a tool. In terms of getting the kids working together and motivating them, the teacher is the most important.”

– Bill Gates

BRAIN-COMPUTER INTERFACES (BCIs): CONNECTING MINDS TO MACHINES

Brain-Computer Interfaces (BCIs) are turning this idea into reality. BCIs are systems that connect our brain directly to machines like computers, wheelchairs, or robotic arms—without using muscles.

Working of BCIs:

Our brain sends tiny electrical signals when we think or move. BCIs use special sensors to detect these signals. These sensors can be:

Non-invasive: Placed outside the head (like a cap with wires).

Invasive: Implanted inside the skull or on the brain, which gives more accurate signals but needs surgery.

The signals are processed by a computer, which turns thoughts into actions—like moving a cursor or robotic arm.

Importance of BCIs:

BCIs are especially helpful for people with disabilities.

People with paralysis can control robotic arms or computers with their thoughts.

A man with ALS was able to speak in real time using a BCI that turned his brain activity into spoken words.

These examples show how BCIs are giving people back their independence.

Real-World Projects

Companies like Neuralink (USA), Synchron, and China's NeuCyber are testing BCIs in humans. Some use surgery, while others are working on safer, wireless systems.

Challenges and Future

There are still issues to solve:

Safety: Implants must not move or harm brain tissue.

Privacy: Brain signals are personal—there must be strong ethical rules.

But scientists are working on lighter, safer devices—maybe even headbands you can wear.

Conclusion

BCIs may sound like science fiction, but they are real and improving fast. They could change how we interact with machines, especially for people with physical challenges. The future of BCI is exciting—and it's just beginning



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**“The best minds
of my generation
are thinking
about how to
make people
click ads.”**

**– Jeff Hammer-
bacher**

THE FUTURE OF AUGMENTED AND VIRTUAL REALITY

Introduction

Augmented Reality (AR) and Virtual Reality (VR) used to sound like something out of a sci-fi movie, but now they're part of real life — and growing fast! From gaming to healthcare, these technologies are changing the way we see and interact with the world around us. In the coming years, they're expected to become an even bigger part of our everyday lives.

What Are AR and VR?

Let's break it down:

- Virtual Reality (VR): This puts you inside a completely virtual world. You wear a headset, and everything you see is created by a computer — it's like stepping into a video game or animated world.
- Augmented Reality (AR): Instead of taking you away from the real world, AR adds digital stuff on top of it. Think of games like Pokémon GO — your camera shows the real world, but you see virtual characters or objects added to it.

Together, AR and VR are part of a bigger tech field called XR (Extended Reality), which also includes Mixed Reality (MR) — a mix of both AR and VR.

Where Are AR and VR Used Today?

☐ Gaming and Fun

Games like Beat Saber (VR) or Pokémon GO (AR) have already made these technologies popular. VR headsets like Oculus Quest let you feel like you're inside the game.

☐ Healthcare

Doctors and medical students use VR to practice surgeries and understand the human body. AR helps surgeons by showing useful digital info while operating.

☐ Education

Imagine learning about planets by walking through a virtual solar system or seeing 3D models in class. AR/VR makes learning more exciting and easier to understand.

☐ Industry and Jobs

VR is used to train people in factories or the military without putting them in danger. AR is used to give workers instructions on machines by just looking at them through smart glasses.

Final Thoughts

AR and VR are not just about fun and games — they're slowly becoming a part of our daily life, in classrooms, hospitals, and even offices. If you're a student, this is a great time to explore these technologies. Who knows? Maybe in a few years, you'll be designing your own AR game or VR world!



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**“Technology
is teaching
us to be
human
again.”**

**– Simon
Mainwaring**

QUANTUM VS. CLASSICAL COMPUTERS : WHAT'S THE DIFFERENCE?

CLASSICAL COMPUTERS :

Classical computers use bits to 0 and 1 to represent data. A bit can only be either 0 or 1 at a time. They use logic gates and follow specific rules and a fixed path of operations to produce an output.

They are built using transistors that represent bits based on electrical signals:

Low voltage – 0

High voltage – 1

QUANTUM COMPUTERS :

Quantum computers follow the principles of quantum mechanics and use “qubits” (an electron or a photon) to represent data. These qubits exist in a state of superposition of 0 and 1. For example, a qubit can have a 70% probability of being “0” and 30% of being “1” until measured.

If there is a system of “n” qubits, it exists in a state of superposition of all possible (2^n) combinations. To get to the result, a quantum computer changes (increases or decreases) the amplitude of each state and arrives at the most probable answer, which, when measured, will be one of the 2^n combinations. We call this superposition ‘collapsing’ to that state.

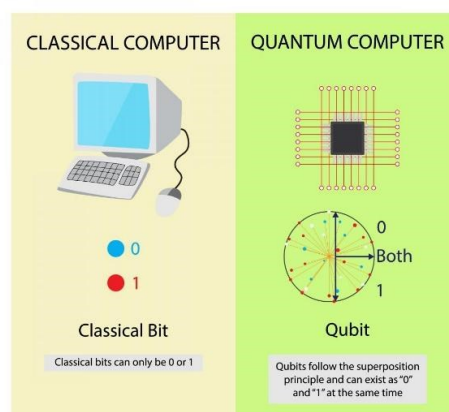
QUANTUM VS. CLASSICAL COMPUTERS :

There is a common misconception that quantum computers will replace classical computers, but they will not. Quantum computers are only faster for certain types of problems such as factoring large numbers or searching unsorted databases. With quantum computers, the improvement is not in the speed of the operations, but in the fact that fewer operations are needed to arrive at the answer.

For everyday tasks such as gaming, web browsing, and general computing, classical computers remain the best choice.



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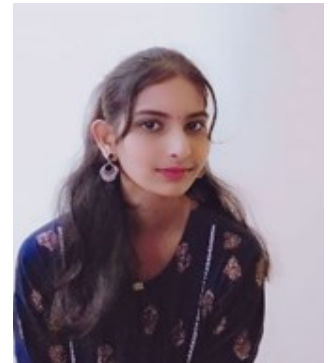


**“Technology is
the campfire
around which we
tell our stories.”
– Laurie Ander-
son**

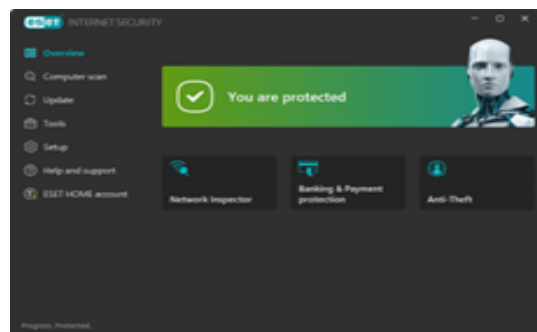
INTERNET SECURITY & DARK WEB

Internet security refers that it protects data, systems, and networks from the cyber threats. It's most important goal is ensuring the (CIA) digital information which are three core principle for protecting data from the Hackers . This includes the protective measures implemented to prevent unauthorized access, Hacking the passwords and information or some other disruptions for network or data.

The dark web is a type of Hidden camera of internet where you can't be able to access by regular browsers . It hides the users identity and location and make it anonymous . The web is used for both legal & Illegal purposes . For an activities like selling drugs & weapons illegally , scams , Hacking services , Human trafficking , hidden marketplaces , stolen data (like credit cards, passwords), Fake documents, psychological impact from disturbing content Etc. This leads to scams and frauds , malware viruses , getting trapped Etc. Cybersecurity experts monitor to prevent these crimes. The dark web is like underground of internet where it contains two sides one is legal & illegal .where legal people like journalists use dark web for Protecting sources and whistleblowers exposing corruption. Dark web requires a special tools like (Tor Browser) to access. Dark webs are hard to trace.



Deva Harshini
Bsc MPCs



“Innovation is taking two things that already exist and putting them together in a new way.”

– Tom Freston

NEURAL NETWORKS: THE BRAINS BEHIND ARTIFICIAL INTELLIGENCE

A neural network is a type of machine learning model inspired by the human brain. It consists of layers of interconnected nodes, or "neurons," which work together to recognize patterns, make decisions, and learn from data. Neural networks form the foundation of many advanced AI applications, including voice assistants, image recognition systems, and recommendation engines.

At its core, a neural network takes in input data, processes it through hidden layers using mathematical functions and weights, and produces an output. Each neuron receives inputs, applies a transformation (usually a weighted sum followed by an activation function), and passes the result to the next layer. As the network is trained on data, it adjusts its weights through a process called backpropagation, aiming to minimize the difference between predicted and actual results.

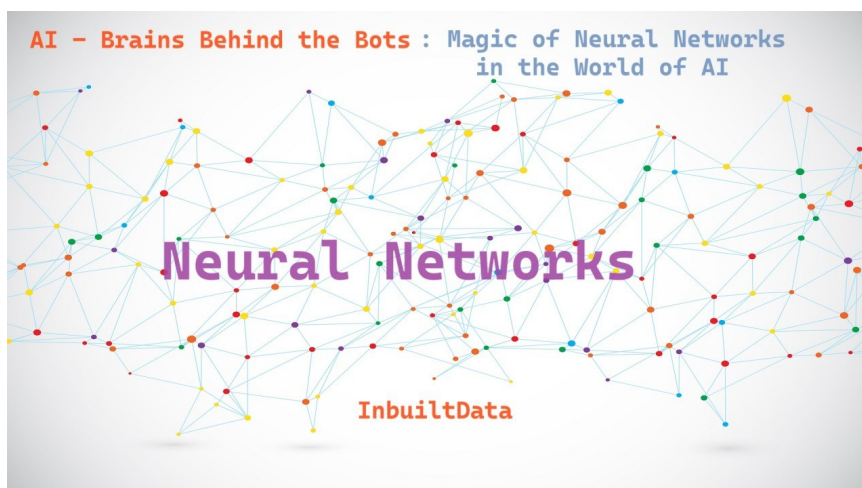
There are several types of neural networks. Feedforward networks are the simplest, moving data in one direction. Convolutional neural networks (CNNs) are widely used for image processing, while recurrent neural networks (RNNs) are ideal for sequential data like text or time series.

Neural networks have revolutionized fields like natural language processing, computer vision, and autonomous systems. However, they require large datasets and significant computational power to perform well. Despite their complexity, neural networks continue to evolve, with research focusing on making them more efficient, interpretable, and robust.

In essence, neural networks mimic how humans learn, enabling machines to understand and act on complex data — making them a cornerstone of modern artificial intelligence.



B. Lasya Varshini
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Bsc 3E



"The world needs people who think and understand deeply, people who ask questions and are creative and are willing to take risks."

—Maria Klawe's

WHAT HAPPENS WHEN YOU HIT 'SEND'?

You type "where are you"? and hit Send.

A second later your friend texts back saying "I'll be there in 10 minutes".

Simple click ,huh? But what actually happened was... a world tour.

First, the message you sent is broken into small packets. Your app (WhatsApp, email etc) collects the data you want to send (text, document, Images, voice notes etc.) along with the details of the sender and receiver. This data is then wrapped into a standard digital package . If you're using secure apps, the package will be encrypted instantly ensuring safety and privacy.

Then your device sends the packets/package to your Internet Service Provider (ISP) your personal digital post office . The server now identifies the recipient's address.

Your message/packets will travel through a maze of servers, cables, satellites, data centers. They hop between the routers to reach the recipient's service provider's server. Sometimes the packets gets lost(of course) then the system requests a resend.

Finally, your friend gets the message and maybe leaves you on "seen".

But hey- you are the cool one who knows what happens behind that one click.



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**"Everybody
should learn to
program a
computer,
because it
teaches you
how to think."
– Steve Jobs,**

BEYOND THE SCROLL

Have you ever found it hard to focus? The constant urge to just crawl back to bed despite having the recommended hours of sleep, or sometimes, do you struggle to sleep, stuck in that constant loop of “doom scrolling” and “bed rotting”

Congratulations, you and the rest of our generation, more so than the previous, have been sharing similar traits. Well, don't worry; the cause for it is something much simpler than you imagined. Back in 2017, a 5000-person study was conducted, and what we found out was a higher social media use correlated with self-reported declines in mental health, physical health, and life satisfaction.

Ever wondered how Instagram and Facebook got so big? In 2020, a Highly recommended Netflix documentary called *The Social Dilemma* showed us just how. The film covers the psychological manipulation by social media companies and how these apps are designed and engineered to exploit psychological vulnerabilities. Tristan Harris, a former design ethicist at Google, termed it “a race to the bottom of the brain stem.” There's a concept, Surveillance Capitalism, coined by Shoshana Zuboff, a professor at Harvard, defined it as “the unilateral claiming of private human experience as free raw material for translation into behavioral data.” Big social networking companies like Instagram, Facebook, Google, and so on collect surplus user data such as locations and search history habits, and this data is then computed as prediction products and then sold to third parties for profit. These third parties then proceed to use this data to manipulate users without them being aware that modifications to their behavior are taking place.

Don't believe your mind is so fickle and prone to manipulation. Well, I hate to break it to you, but the human brain has always been gullible. Studies show that humans tend to flock to something with a mass following. Take the “Labubu” craze, for instance. Why has this single plushie gained so much hype? Media Marketing. The only reason it became a trend was because a bunch of influencers told us to like it. The concept “trend” shows us how easy our brain is to steer, now imagine this on a huge scale.

The idea of our data being sold as products is morally wrong and should raise huge red flags, because at the end of the day, our data and experiences as humans make us who we are. The media we consume is extremely important in today's day and age. Media can influence our thoughts, the way we speak, what we wear, what we buy, and literally shape our lives if we let it.

And now this media is being monitored and modified based on an algorithm that is designed to not only promote products under the guise of it being “based on our current topics” but also to censor and distract us from major affairs that affect us.

I think, therefore I am, a famous philosophical statement coined by René Descartes. This statement implies that our thoughts shape who we are as individuals, and if our thoughts can be easily manipulated, where does that leave us? Social media can not only influence us when it comes to what we buy but also who we support when it comes to politics, and that is where it becomes scarier; for example, currently Instagram blocks the majority of the posts or reels that talk about Gaza and the genocide happening under it for being “too violent.”

If we as a species cannot responsibly consume media, it will ruin us and lead us to being puppets controlled by an algorithm that is designed for one thing, and that is profits. We have a responsibility to make sure what we consume as individuals isn't harmful to us or our species. The underlying bias must always be checked, the credibility of the source has to be present, and most of all, we must strive to constantly educate ourselves and be socially aware.



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"The world needs people who think and understand deeply, people who ask questions and are creative and are willing to take risks."

—Maria Klawe's

CYBER SECURITY

As the technology evolves, we see an increase in the number of cyberattacks as all our personal information is connected to the internet, from banking and social media, to cloud storage. Receiving an unknown message asking for your personal details could be a cyber-attack. To prevent these malicious practices cybersecurity was introduced. It is used to protect user information, system data and computer storage against the third-party frauds and unauthorized access. There are various methods to protect the data, like Enabling two-factor authentication, install anti-malware software and use a firewall. Even creating a complex password, regularly backing up data, keeping your software up-dated, and avoiding clicking on unknown links will also help prevent the cyber-attacks. As the cyber-attacks continue to increase, cybersecurity has become more common to protect the user data. Cybersecurity is not just about the complicated systems but also about protecting user trust and privacy. It is to create an awareness among the public to not overshare their personal information, and to be cautious with unknown websites or links.



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*"Everybody
should learn to
program a
computer,
because it
teaches you
how to think."
– Steve Jobs,*

5G EXPANSION

5G is the 5th generation mobile network. It is designed to connect machines, objects, and devices. 5G is offering speed up to 10 Gb per second, enabling buffer-free streaming and also faster downloads. It is a key aspect of the internet of things. Industries can benefit from smart automation remote operations and real-time data processing because of this.

Nations like the United States, China, and South Korea have already built wide coverage of 5G. Governments are supporting infrastructure pushes and digital development initiatives. To set up a 5G, it requires thousands of small cell towers, fibre optic cables and other equipment. It also needs massive investment and public awareness.

It is becoming a crucial thing for next generation education. It is not just an upgrade. It is a revolution in the way we live, work and connect.



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*"The best way to
find yourself is to
lose yourself in
the service of
others."*

*-Mahatma
Gandhi*

EDGE COMPUTING

Edge computing is a distributed computing model that brings computation and data storage closer to the sources of data. More broadly, it refers to any design that pushes computation physically closer to a user, so as to reduce the latency compared to when an application runs on a centralized data centre. The term began being used in the 1990s to describe content delivery networks—these were used to deliver website and video content from servers located near users. In the early 2000s, these systems expanded their scope to hosting other applications, leading to early edge computing services. These services could do things like find dealers, manage shopping carts, gather real-time data, and place ads. The Internet of Things (IoT), where devices are connected to the internet, is often linked with edge computing.

Edge computing might use virtualization technology to simplify deploying and managing various applications on edge servers. Edge computing brings analytical computational resources close to the end users and therefore can increase the responsiveness and throughput of applications. A well-designed edge platform would significantly outperform a traditional cloud-based system. Edge computing is more likely to be able to mimic the same perception speed as humans, which is useful in applications such as augmented reality. Due to the nearness of the analytical resources to the end users, sophisticated analytical tools and artificial intelligence tools can run on the edge of the system. This placement at the edge helps to increase operational efficiency and is responsible for many advantages to the system. Putting compute at the edge allows companies to improve how they manage and use physical assets and create new interactive, human experiences. Some examples of edge use cases include self-driving cars, autonomous robots, smart equipment data and automated retail factory floors, retail showrooms, shipping containers, hospitals, construction sites, energy grids, and farms—and even the International Space Station Autonomous robots, self-driving cars, smart equipment data, and automated retail are key use cases of edge computing.

The main aim of edge computing is to allow smart devices in remote or challenging environments to function without needing a full connection to a central network. Edge computing improves efficiency, downtime, and predictive maintenance by monitoring and controlling machines and industrial processes in real time.



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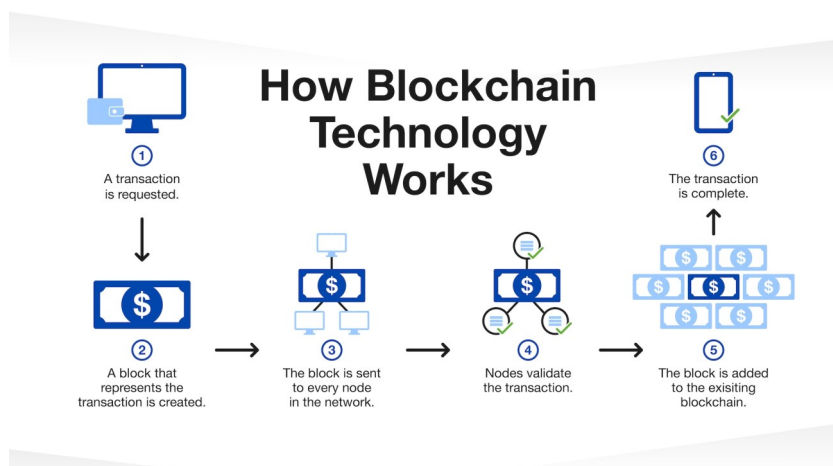
***"Everybody
should learn to
program a
computer,
because it
teaches you
how to think."
– Steve Jobs,***

BLOCKCHAIN TECHNOLOGY

Blockchain technology is an advanced database mechanism that allows transparent information sharing within a business network. A blockchain database stores data in blocks that are linked together in a chain. The data is chronologically consistent because you cannot delete or modify the chain without consensus from the network. As a result, you can use blockchain technology to create an unalterable or immutable ledger for tracking orders, payments, accounts, and other transactions. The system has built-in mechanisms that prevent unauthorized transaction entries and create consistency in the shared view of these transactions. Data in a blockchain database is kept in blocks that are connected in a chain. One of the most significant technological developments of the last ten years is blockchain. However, there isn't always a thorough comprehension of what blockchain is, how it functions, or why it's used beneath the surface chatter. Additionally, it has the power to fundamentally alter industries. Blockchain technology achieves decentralized security and trust in several ways. To begin, new blocks are always stored linearly and chronologically. After a block has been added to the end of the blockchain, previous blocks cannot be altered. A change in any data changes the hash of the block it was in. Because each block contains the previous block's hash, a change in one would change the following blocks. The network would generally reject an altered block because the hashes would not match. However, a change can be accomplished on smaller blockchain networks.



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"The best way to find yourself is to lose yourself in the service of others."

-Mahatma Gandhi

FUTURE OF AUTONOMOUS

An autonomous vehicle is defined by the University of Michigan Center for Sustainable Systems as one that uses “technology to partially or entirely replace the human driver in navigating a vehicle from an origin to a destination while avoiding road hazards and responding to traffic conditions.”

- How Do Self-Driving Cars Work?

Self-driving cars see what’s going on around them using three main electronic “eyes”—radar, cameras and laser-based LiDar, which stands for light detection and ranging. All three feed data into on-board processors, using sophisticated software, algorithms and machine learning to send signals to the vehicle’s actuators to trigger appropriate actions such as braking, steering and acceleration. The array of sensors can detect a wide variety of road features and obstacles such as lane markings, curbs, pedestrians, cyclists or other vehicles. This is done either visually, through cameras, or by bouncing light impulses or radar signals off of surrounding objects.

- Future of Self-Driving Cars

Consumer appetite for leaving the driving to technology is growing and they’re willing to pay for it, leading automakers to boost ADAS and other automation offerings, perhaps paving the way for fully self-driving cars and trucks to one day be available and affordable for individuals. Based on consumer interest in automated driving features and commercial solutions available on the market today.

- Conclusion

As technology expands throughout the world, self-driving cars will become the future mode of transportation universally. The legal, ethical, and social implications of self-driving cars surround the ideas of liability, responsibility, and efficiency. Autonomous vehicles will benefit the economy through fuel efficiency, the environment through reduced carbon emissions, society through more togetherness, and the legal system through a simpler system of liability.



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“Everybody should learn to program a computer, because it teaches you how to think.”
– Steve Jobs,

AI VS CREATIVITY

It's 2025, full of AI tools. Everyone is using AI tools to make life easy. There was a time when a student once spent weeks crafting their own heartfelt poem, Paintings, drawings etc. But today, a few words typed into ChatGPT can give us what we need. These AI tools like ChatGPT, are changing the meaning of originality, effort, and expression.

Let's take the example of Gabli art, known for its intricate patterns and soulful details. Artists spend months and sometimes years perfecting each piece by hand. Every stroke carries patience, tradition, and emotion.

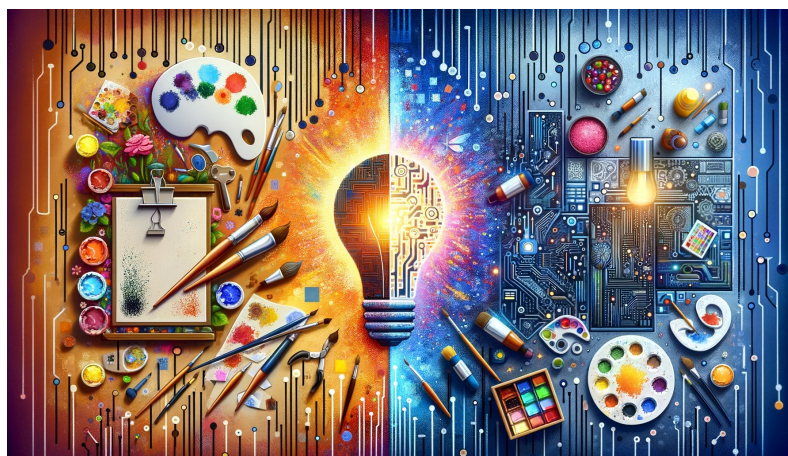
But now, AI tools like ChatGPT replicate similar designs using image prompts within seconds. But AI cannot imitate the story behind each line the small imperfections that make it unique.

In Conclusion

In the age of AI, creativity is losing its soul. And the soul of creativity comes from the heart of a human, not from AI tools or machines.



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“A computer is like air conditioning – it becomes useless when you open windows.”

– Linus Torvald

THE RISE OF EMOTION AI: CAN MACHINES TRULY UNDERSTAND US?

In the age of rapid technological evolution, machines are no longer limited to cold logic and rigid commands. Enter Emotion AI, also known as Affective Computing—a field where artificial intelligence learns to detect, interpret, and respond to human emotions.

Imagine your virtual assistant sensing you're upset just by your tone and offering comfort or playing calming music. This isn't science fiction—Emotion AI is being used in customer service, healthcare, education, and even advertising. By analyzing facial expressions, voice modulations, and physiological signals like heart rate or eye movement, machines are beginning to understand the unspoken layers of human communication.

Tech companies are already integrating emotion-sensing features into products. Tools that detect student frustration in virtual classrooms or monitor emotional well-being through wearable devices are becoming more common. This promises personalized experiences and better mental health support—but it also opens up serious ethical debates.

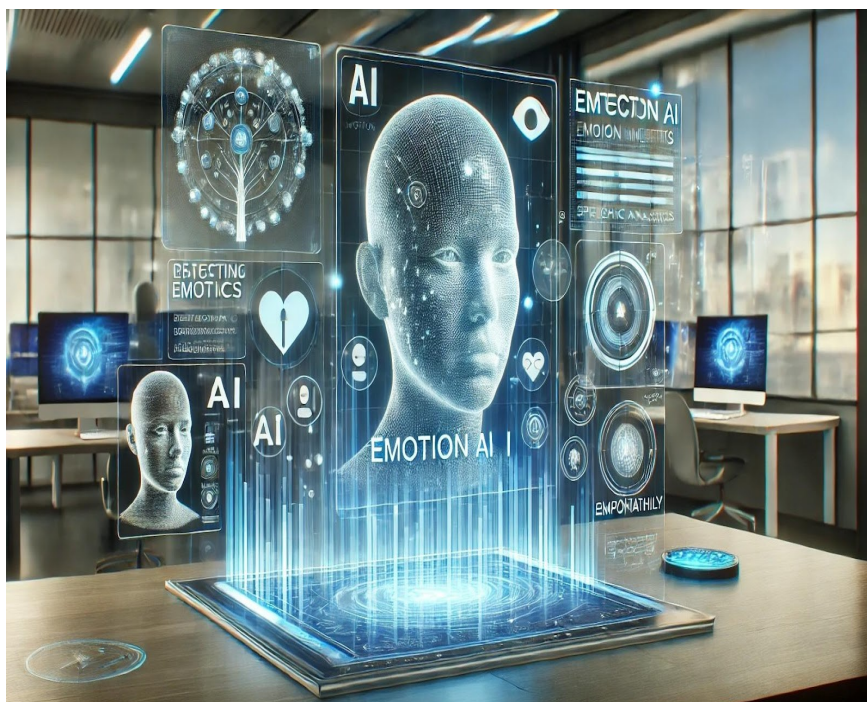
Can we trust machines with something as personal as our emotions? What about data privacy? And if companies know how we feel, could that knowledge be misused for manipulation?

Emotion AI is a powerful step forward in human-computer interaction, but it brings the responsibility to implement it ethically. As students and future innovators, we must ask: Should machines understand emotions—or just simulate empathy?

The future of Emotion AI isn't just about technology. It's about trust, ethics, and the essence of what makes us human.



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“Computers are good at following instructions, but not at reading your mind.”

– Donald Knuth

CLOUD COMPUTING

Technology has revolutionized the way we live and work. As we increasingly rely on digital systems, cybersecurity has become a critical concern to protect our data and infrastructure. With a steady rise in Cyber threats around the world as adversaries are becoming more sophisticated, it becomes crucial for organisations and general crowds to learn about the cyber security trends.

Cyber Security and Cyber Attacks

Cyber Security is the information technology security that defends computers, servers, networks, and data from malicious attackers.

The prominent types of Cyber Attacks are- Phishing, where deceptive emails or messages are sent to the victim to obtain sensitive information. Another type is Ransomware where the hackers design a software that encrypts files and they in return, demand payment from the victims for their data to be released. The Man-in-the-middle(MitM) is a way of intercepting and manipulating communication between two parties without their knowledge.

Real-life example of a Cyber threat

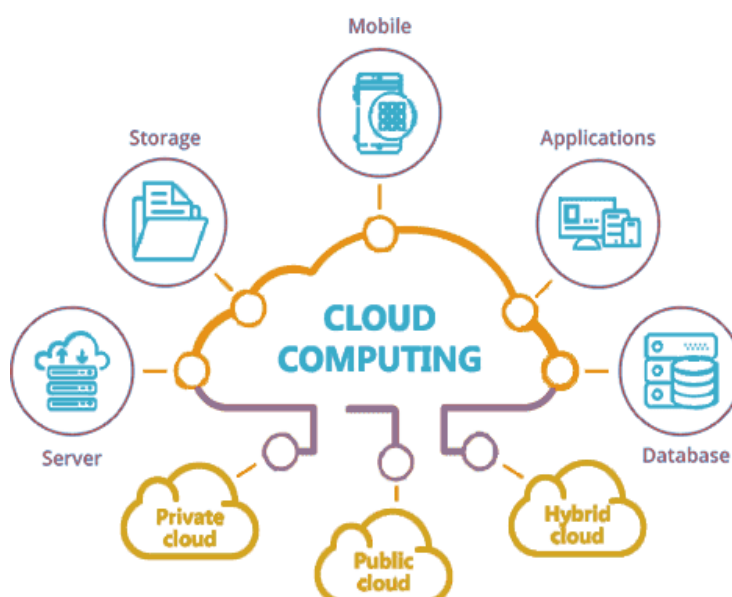
The impact of Cyber Threats can be financial losses, Data Breaches, and reputational damage. Securing the number one spot is the attack on Yahoo.

The company first publicly announced the incident – which it said took place in 2013 – in December 2016. Yahoo announced that the actual figure of user accounts exposed was 3 billion. After investigation, it was discovered that, while the attackers accessed account information such as security questions and answers, plaintext passwords, payment card and bank data were not stolen.

In conclusion, cyber security is a critical concern that requires attention and action from individuals and organizations alike to protect against emerging threats and ensure a safer digital future for all.



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"The best way to find yourself is to lose yourself in the service of others."

-Mahatma Gandhi

THE MIND ON MUTE: IS CHATGPT QUIETLY STEALING OUR THOUGHTS?

In today's world, with the invention of AI, human interaction with technology-especially tools like ChatGPT has increased significantly. Generating human-like text responses to answering complex queries. ChatGPT has transformed the way we access information. But behind this seamless experience, a quiet shift may be unfolding: could our thought process be changing without us even realizing it?

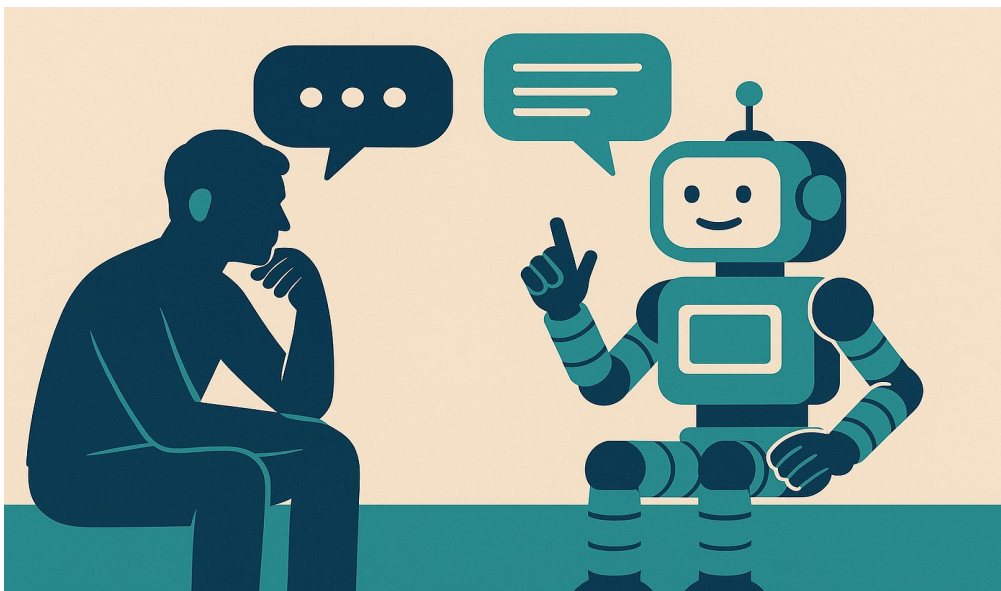
A recent study used Electroencephalogram (EEG) scans to measure brain activity during AI-assisted writing among brain-only, Search-engine, and ChatGPT groups and found ChatGPT users showed lowest brain activity, less originality and weaker memory recall.

We are outsourcing essential cognitive tasks by increasingly relying on ChatGPT to think, write and create. This concept, known as cognitive offloading, once applied to calculators and maps, is now extending to our ideas, reasoning and even opinions. AI certainly boosts productivity but also risks replacing the slow, reflective thinking that is vital for deep understanding. Creativity and critical thinking which are usually sharpened through brainstorming and efforts may decline if we accept AI generated answers without analyzing them.

ChatGPT is a brilliant assistant, but it shouldn't be a replacement for our minds. The goal is not to reject it but to engage with it wisely. Let it support our ideas, not replace them. In a world full of artificial answers, it's our conscious thinking that must stay real to preserve the richness of human cognition in this digital age.



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"The advance of technology is really about making it disappear."

– Mark Weiser

THE HEAT BEHIND REACTIONS

Chemical thermodynamics is a branch of chemistry that deals with the relations between heat, work, and energy during chemical reactions and physical transformations. It uses principles of thermodynamics to know the feasibility and extent of chemical processes. Chemical thermodynamics is a bridge between the macroscopic properties of a substance and the individual properties of its constituent molecules and atoms.

First Law of Thermodynamics

First law of thermodynamics, also known as the law of conservation of energy, states that energy can neither be created nor destroyed, but it can be changed from one form to another. Few examples of the first law of thermodynamics. Switching on light may seem to produce energy, but it is electrical energy that is converted.

Second Law of Thermodynamics

Second law of thermodynamics states that the entropy in an isolated system always increases. Any isolated system spontaneously evolves towards thermal equilibrium—the state of maximum entropy of the system. For example if two different gases are initially separated, they will spontaneously mix when the barrier between them is removed, increasing the overall entropy of the system as the molecules become more randomly distributed.

Third Law of Thermodynamics

Third law of thermodynamics states that the entropy of a system approaches a constant value as the temperature approaches absolute zero. The entropy of a pure crystalline substance (perfect order) at absolute zero temperature is zero. This statement holds true if the perfect crystal has only one state with minimum energy. For example As a gas is cooled, its molecules slow down and become more ordered. At absolute zero, the gas would ideally condense into a solid with a perfectly ordered crystal structure, exhibiting minimal entropy.



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“AI is probably the most important thing humanity has ever worked on.”

– Sundar Pichai



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