

**SRM VALLIAMMAI ENGINEERING COLLEGE**

**COMPUTER SOCIETY OF INDIA**

**STUDENT BRANCH**

**MAGAZINE - 2024**

**VOLUME - IV ISSUE -III**



**LimeLight**



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# INTER COMMUNICATION MAGAZINE

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### **About SRMVEC CSI-SB :**

SRM Valliammai Engineering College Student Branch was started in the year 2007. For the past 16 years, SRMVEC has organised various events and contributed many technical articles to CSI. It is one of the most active student branches of CSI. It has received the 'Best Accredited Student Branch Award' for four consecutive years since 2015 at Annual CSI Convention from Computer Society of India. Currently there are more than 370 Student members in the student branch.

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# PREFACE

It gives us great pleasure to release the third issue of volume four 'LimeLight'. The SRMVEC CSI-SB members have been enthusiastic to show their talents. This magazine gives desired opportunity and platform to publish the students' thoughts and creativity. We strongly believe that the purpose of knowledge is fulfilled only when it is transferred to another person. In this manner, this magazine would serve as a collection of knowledge. With technology growing leaps and bounds day by day, people need to be aware of the ongoing development in technology. We appreciate every who stood with us in this venture.

Regards  
SRMVEC CSI-SB Team



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# EVENTS

## LOONOTOPIA

The SRM Valliammai Engineering College, Computer Society of India – Student Branch, organized the “LOONOTOPIA” event. In this event, around 120 students from various departments registered and 90 students participated.



The event was conducted on 16<sup>th</sup> February 2024, at the Old Seminar Hall. This event comprised of two rounds, engaging the students in challenging puzzles and connections. The participants gained so much knowledge and acquired new insights. Winners were celebrated for their exceptional skills and perseverance.



The event ended in grand success due to guidance of CSI Student Branch Counsellor Dr. M. Senthil Kumar (HOD, Department of Cyber Security) who supported us in coordinating this event

## 5<sup>th</sup> CSI State Level Student Convention - 2k24

The SRMVEC CSI Student Branch, on the occasion of CSI day conducted an offline event named “5<sup>th</sup> CSI State Level Student Convention - 2k24” for all the students from various colleges from across Tamil Nadu on 6<sup>th</sup> March 2024 from 09:00 AM to 04:00 PM at Admin Block, SRM Valliammai Engineering College, Chennai.



The event was inaugurated by our honourable Principal, SRMVEC & Chairman, CSI-KPM Dr. M. Murugan. The event was enlightened by the insights of our delightful chief guest, Prof. C. R. Muthukrishnan, Former Director, IIT Madras & Former President, Computer Society of India.

# EVENTS

Dr. M. Senthil Kumar, our esteemed CSI Coordinator, Professor & Head of the Cyber Security Department, also shared his insightful thoughts during the event to our students.

The events conducted are as follows,

- Innovate Papers
- TechScape Quest
- TriCode Challenge
- Meme-It-Up
- Obliviate
- Startup Surge

More than 150 students had participated, and more than 20 participants won prizes in their respective events. Students from various colleges all around Tamil Nadu participated.

Some of the major Colleges include,

- Sri Sairam Institute of Technology
- Sri Sairam Engineering College
- Kongunadu College of Engineering and Technology
- Kamaraj College of Engineering and Technology
- Chennai Institute of Technology
- Sathyabama University

The Convention was concluded with a valedictory function, by awarding prizes to all the respective winners. The event ended in grand success due to the guidance of CSI Student Branch Coordinator Dr. M. Senthil Kumar (HOD, Department of Cyber Security) who supported us in coordinating this event. .





# GENERATIVE AI: A New era of generative creativity

## Introduction:

The term generative AI might not have been familiar 10 years ago but, the current revolution in AI which includes generative models like AI chatbots, image generators, voice generators, etc., made the fame of Artificial intelligence models rise and reach its zenith. Current generative models like Chat GPT, Bing Copilot, BARD, etc. which are highly advanced and being updated frequently gave a touch of improvement to the already existing models of automated chatbots.

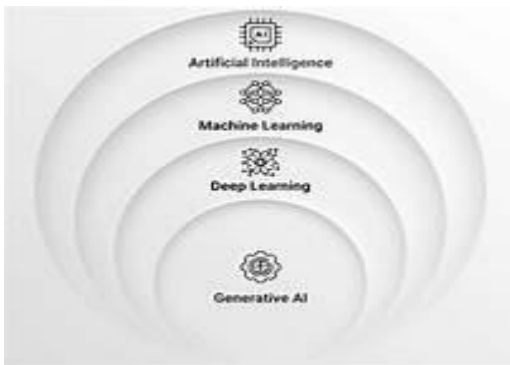


Fig 1.1: Generative AI  
**History Of Generative AI:**

Though the actual generative AI models were developed after 2010, the foundation of AI began much earlier than anticipated. AI's early concepts marked its entry in the 1950's followed by a series of rises and falls leading to alternating waves of fluctuations between the AI revolution and

the AI winters where the fundings for AI projects were completely ambushed. The expert systems developed between 1970-1980, the Bayesian network, and Markov models developed in the 1990s were the predecessors and paved the way for the growth of generative AI.

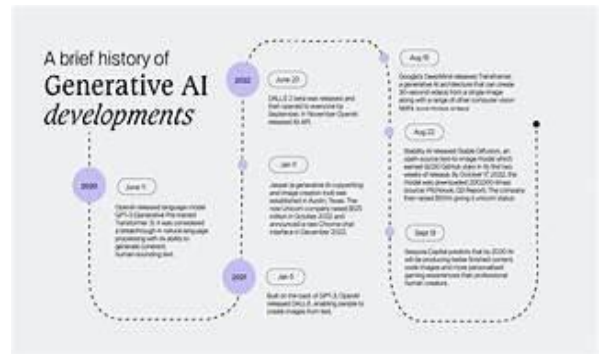


Fig 1.2: History of generative AI

## Remarkable Contributions Towards The Field:

The Generative Adversarial Networks (GANs) research covered by Ian Goodfellow and his team contributed to some of the notable research in the rise of Generative AI. Yoshua Bengio, Geoffrey Hinton, Yann LeCun, Juergen Schmidhuber, Tero Karras, Timo Aila, Samuli Laine, and Jaakko Lehtinen have made significant contributions to the theory, algorithms, and applications of generative AI, driving its growth and fostering innovation in the field.



# GENERATIVE AI: A New era of generative creativity

## Definition And Interpretation Of Generative AI:

The term Generative AI which is a sub-division of artificial intelligence uses trained datasets containing supervised or unsupervised learning models in the generation of new data by providing data beyond the existing dataset's knowledge.

Apart from basic tasks performed by AI: classification, regression etc., generative AI produces output in various formats as requested by the user.

General output modalities include audio, video, text, code, music, etc.

## Generative AI Modalities:

The general modalities of generative AI include audio generation, text generation, music generation, code generation, etc.



Fig 1.3: Generative AI modalities

## Text Generation:

Text generation models like chat GPT, Bing copilot, etc. generate text-based output on the topics requested by the user. These models not only use existing datasets like BookCorpus, and Wikipedia but also work with Natural Language Processing, Machine Translation, and training using word tokens.

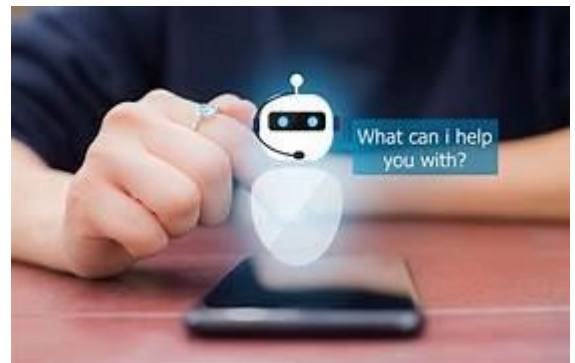


Fig 1.4: Text-generating AI

## Code Generation:

Generative AI models like Open AI and Blackbox AI which are trained using large volumes of programming data thus generate source code as requested by the user by acknowledging all the required factors.

They train in various programming languages and thus provide code that is highly interoperable, robust, and secure.



# GENERATIVE AI: A New era of generative creativity

## Image Generation:

Apart from generating text-based output, these models are capable of analyzing the user's request and providing suitable output in an image-based format. These images are highly unique and can be incorporated into different image formats. The images generated are of high quality and can be simply created by conversion of text-to-image through modules. DALL-E, Midjourney, Adobe Firefly, Stable Diffusion, etc are some of the widely used text-to-image generation AI.

## Audio/Voice Generation:

These are trained with large volumes of voice modules thus enabling them to produce more natural audio when requested by the user. From instrumental sounds to actual voices this module contributes majorly towards generative audio AI. They help in generating new audio samples by the text-to-speech modules that generate audio output.



Fig 1.5: Audio generating AI

## Judicial Law Incorporated:

When a new model gets maximum reach and takes over the world it is natural to create various laws for protecting it from being exploited. Some of these laws are implemented to completely prevent dangerous functions from being introduced thus protecting it from wrong hands.

Some of the laws established for generative AI include

- AI-generated content must be watermarked
- Copyrights for open-source content only.
- Fairness, accountability, transparency, and inclusivity
- Consumer Protection Laws Etc.

## Real-life Scenerios Where Generative AI Rules:

- Enhancing medical images by improving the quality of the said images like x-rays, scan reports, etc.
- New drug manufacturing.
- In marketing campaigns to improve the rate of sales, in the production sector to provide user interest-based models.
- Accelerating the design and speed of production of goods.



# GENERATIVE AI: A New era of generative creativity

## Conclusion:

The revolutionary concept of generative AI, as time passes by grows at a rapid speed. As the areas of applications increase ethical considerations must be taken seriously as these are highly advanced and can be misused when reaching the wrong hands.

Thus, a safe practice of using generative AI must be held accountable all the time for efficient utilisation.

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# 5G TECHNOLOGY IN INDIA

## Introduction:

The advancement of 5G technology has drawn the interest of both technology professionals and the general public. 5G has been branded the next revolution in cellular technology, promising to bring the globe closer together. In terms of connectivity speed, utility, and business use cases, 5G represents an evolutionary

leap. The global services market value of 5G technology is expected to be USD 83.24 billion in 2021. It is predicted to expand at a 23% CAGR to reach USD 188 billion by 2025.

## What exactly is 5G?

The fifth generation of cellular networks is known as 5G. It is the most recent in a





# 5G TECHNOLOGY IN INDIA

series of mobile technologies that began in the 1980s with the introduction of 1G. 5G technology, in theory, aims to connect gadgets, machines, and the people who use them via high-speed, low-latency data connections. Business trends in 5G technology forecast a significant increase in the internet of things (IoT) by building an ecosystem of connected gadgets and equipment.



Fig 2.1: 5G in India

## The Evolution of 5G

- **1G - First generation:** This technology was introduced in the 1980s and served as the analogue telecommunications standard.
- **2G - Second generation (average download time for a 30 MB file - 40 minutes):** It introduced digital telephony over cellular networks in the 1990s as a successor to 1G technology.
- **3G - Third generation (average download time for a 30 MB file - 1 minute):** This technology, which was introduced in the 2000s, heralded the arrival of the internet on mobile devices by providing faster data speeds.

- **4G - Fourth generation (average download time for a 30 MB file - 8 seconds):** With 4G Long Term Evolution (LTE), mobile data connectivity becomes increasingly faster during the next decade.
- **5G - Fifth generation:** It is the most recent in a sequence of cellular network technologies. Each generational change has brought about major changes in the nature of service, technology, transfer speeds, and usage.

## How 5G is different from 4G?

Maximum upload and download speeds for the fourth generation (4G) mobile network standard are 500 Mbps and 1 Gbps, respectively. With a latency of roughly 50 ms, this network is suitable for wearables, mobile TV, high-speed applications, and more. It is not as efficient as 5G, though. The primary goals of the fifth generation (5G) are faster download and upload speeds, improved multimedia experiences, and wireless connectivity. It will guarantee low latency of roughly 1 ms, enhanced robots and medical systems, and high-resolution video streaming.

## Advantages of 5G:

- **Faster speeds:** 5G is faster than 4G and 4G LTE on phones and other devices. Music, movies, and videos can now be downloaded in seconds rather than minutes.





# 5G TECHNOLOGY IN INDIA

Businesses can use the network's 20 Gbps speed for services like automation and enhanced web conferencing, among other things. According to a recent poll, users who used 5G saved around 23 hours per day on downloading.

- **Minimal latency:** 5G has reduced latency over 4G and is better suited to new applications like AI, IoT, and virtual reality. It also facilitates website access and exploration for mobile phone users. It also provides you with an internet connection for those times when you need to look up critical information.

- **Enhanced capacity:** 5G may have a capacity that is more than 100 times greater than 4G. Since it facilitates the analysis's transition between cell phones and Wi-Fi wireless solutions, performance is greatly improved. It also offers useful methods for gaining access to the internet.

- **Increased bandwidth:** The fastest possible data transmission is made possible by 5G's increased bandwidth, which is one of its key benefits. By selecting a 5G network, mobile phone users can also ensure a faster connection with more bandwidth.

- **Promoting inventiveness:** 5G technology enables communication between sensors and drones. It provides methods for quickening the adoption of IoT, allowing businesses to boost output and take other actions.

## Disadvantages of 5G:

- **Inadequate global coverage:** The main disadvantage of 5G is that it is currently only available in a few locations and has a patchy global coverage. Cities will be the main beneficiaries of the 5G network; rural areas might not get coverage for several years. When compared to other networks, the installation costs of tower stations are very high.

- **Reduced transmission range:** 5G's range is not as great as 4G's, despite its faster speeds. Trees and other large structures may also obstruct the 5Gbps bandwidth, leading to several issues. This means that more towers are needed to provide coverage, which is expensive and time-consuming. Rain may interfere with 5G coverage, so additional precautions are needed.

- **Rate of uploads:** Thanks to 5G technology, mobile phone users can enjoy fast download speeds, and upload speeds are only slightly slower than 100 Mbps when compared to 4G. Better battery technology is also required for mobile phones to support 5G connections. Many phone owners have noticed that their phones heat up more when using 5G.

- **Weakening of gadget batteries:**

5G-enabled phones will experience severe power drain, which will drastically shorten their battery life. Because of this, manufacturers need to spend money on cutting-edge battery technology to stop problems like breaking batteries.



# 5G TECHNOLOGY IN INDIA

• **Cyber security:** One of the disadvantages of 5G is the potential for hacking. The increased bandwidth makes it possible for hackers to steal the database. It also runs software that is open to attack vectors. The probability of an attack rises significantly as more devices are connected to 5G. In order to safeguard their infrastructure, companies and organizations will have to invest more money in security operations centers.

## Conclusion:

The rapid evolution of technology is influencing people's lives by enabling faster communication, interaction and easy access to information, thereby improving their

quality of life. Newer generations of mobility networks are constantly being driven by additional services and higher throughputs.



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# MACHINE LEARNING

## Introduction:

Welcome to the world of machine learning! This is like teaching a computer to learn from data and make informed decisions on its own. In this article, we will examine how machine learning works at different levels and how it can be used in real life.

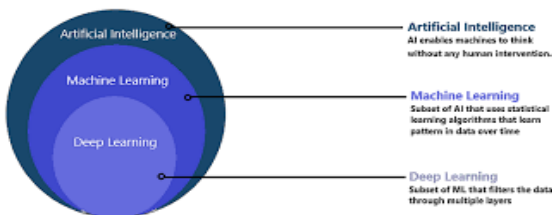


Fig 3.1: Aspects of Machine learning

## Phases:

### A. Data Collection:

- First, we collect all the data we need. This can come from many sources, such as databases, sensors, or the Internet.
- We make sure the information we collect is good and relevant to what we are trying to do.

### B. Preliminary data:

- Then we clear the recorded data. It's like cleaning a dirty room!
- We organize information and correct errors to make it easier for computers to understand.



# MACHINE LEARNING

C. Model Building: Now comes the fun; building a machine learning model! Think of it like teaching a robot new tricks. We choose the right tools (algorithms) for the job and train computers to make predictions or find patterns in data.

D. Model Testing: While our models are being trained, we need to check how well they work. We use special tests to see if the predictions that the computer makes are accurate and useful.

E. Model Deployment: Finally, we apply the model to the real world. By helping people complete different tasks, they begin to predict or make decisions on their own.

## The four main aspects of machine learning ,

### 1. Supervised learning:

i) Similar to teaching pattern labels to children. In follow-up studies, the computer provided recorded data (responses).

ii) Learn how to find patterns in data and understand relationships between inputs (features) and outputs (text) to make predictions or decisions.

2. Unsupervised learning: Imagine handing out a box of mixed toys with no labels or explanations. In unsupervised learning, the computer provides information without written notes. Trying to understand the data without explicit guidance, trying to find patterns or groups in the data on your own.

3. Semi-supervised learning: Consider a combination of supervised and unsupervised learning. In a counter contrast study, a computer was presented with a small amount of labeled data and a large amount of unlabeled data. It learns domain names and uses this information to understand anonymous data and combine it in two ways.

4. Reinforcement learning: Consider training your pet by rewarding good behavior and gently correcting mistakes. In reinforcement learning, computers learn by interacting with their surroundings. You accept rewards or punishments based on your actions, and your judgment gradually improves through repeated attempts. These four types of machine learning involve different approaches suited to different types of problems and data.

## Advantages:

1. Machine learning helps us understand a lot of information, making it easier for us to make decisions.

2. It saves time and energy by completing tasks faster and more accurately than humans. Sometimes it can provide us with personalised services, such as recommending movies we like.

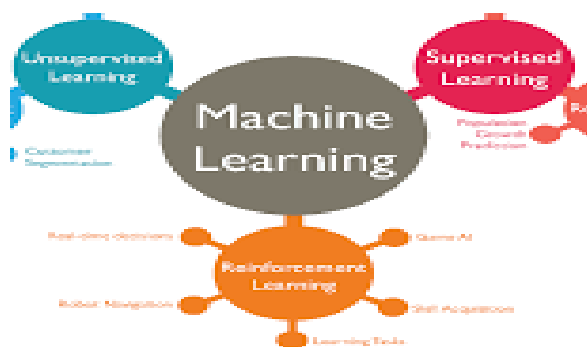


Fig 3.2: Types of Machine learning



# MACHINE LEARNING

## Disadvantages:

1.Sometimes machine learning can make mistakes or give wrong results because it learns from data.

2.Machine learning can tell this because of how it models the decisions it makes, especially when it is a decision.

3.When using machine learning, we must be careful about people's privacy because it involves a lot of personal information.

## Applications:

1.Text Prediction: Did you know that when you type on your phone it tells you the next word? This is a book of prophecy. It uses machine learning to predict what you'll say next based on information you've previously entered.

2.Virtual Personal Assistant: Think Siri or Alexa. They are like your digital assistant; They answer questions, set reminders, and even control smart devices in your home. They use machine learning to understand your commands and give you the right answers.

3.Fraud Detection: Banks and credit card companies use machine learning to detect unusual patterns in your spending habits. If they see something that looks suspicious, like a large purchase made overseas, they can flag it as fraud and notify you.

4.Medicine: Doctors can use machine learning to help diagnose diseases. By giving patients more information and

results, they can learn patterns and symptoms, helping to detect and treat disease early.

5.Driverless Cars: Driverless vehicles use machine learning to navigate safely. Using real-time data collected by sensors and cameras, they detect obstacles, pedestrians and other vehicles and decide where to go and how to proceed.



Fig 3.3: Machine learning

## Conclusion:

Machine learning is like a good advisor that can help us understand the world of data. By understanding how it works and remembering its strengths and weaknesses, we can use it to make our lives easier and work better. So let's embrace the power of machine learning and explore the endless possibilities it offers!



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## REVOLUTIONIZING USER EXPERIENCES WITH HUMANE'S AI PIN: A FUSION OF AI AND WEARABLE TECHNOLOGY

### Introduction:

Humane's AI Pin represents a revolutionary leap in wearable technology, seamlessly integrating artificial intelligence (AI) capabilities to deliver personalized and context-aware experiences across various industries and user scenarios. This essay explores the key features, technological advancements, and potential applications of the AI Pin, highlighting its impact on human-computer interaction and user-centric innovation.

The convergence of AI and wearable technology has unlocked unprecedented opportunities to enhance user experiences and streamline everyday interactions with smart systems. Humane's AI Pin emerges as a trailblazing device, combining sophisticated AI algorithms, context awareness, and interactive interfaces to redefine how individuals engage with technology. This section provides an overview of the AI Pin's significance in reshaping human-computer interaction and sets the stage for a detailed exploration of its features and applications.

### The Evolution of Wearable Technology

Before delving into the specifics of Humane's AI Pin, it is essential to trace the evolution of wearable technology and its transformative impact on various sectors.

From early fitness trackers to advanced smartwatches and augmented reality glasses, wearables have evolved to become seamless extensions of human capabilities, enhancing communication, data monitoring, and decision-making processes. The AI Pin builds upon this evolutionary trajectory, offering a compact yet powerful platform for intelligent interactions and personalized services.

### Key Features :

**Compact Design:** The AI Pin's ergonomic and portable design facilitates on-the-go usage, ensuring users can seamlessly integrate it into their daily routines.



Fig 4.1: AI PIN

**AI Integration:** Powered by advanced AI algorithms, the device analyzes user behavior patterns, environmental cues, and context-specific data to deliver personalized recommendations, assistance, and services.

**Context Awareness:** Leveraging machine learning sensors and models, the AI Pin adapts to diverse environments, understands contextual nuances, and provides real-time, tailored information to users.

**Interactive Interface:** Through voice commands and touch inputs, users can effortlessly control and engage with the AI





## REVOLUTIONIZING USER EXPERIENCES WITH HUMANE'S AI PIN: A FUSION OF AI AND WEARABLE TECHNOLOGY

Pin, fostering a natural and intuitive user experience.

**Applications Across Industries:** The versatility of Humane's AI Pin extends across multiple sectors, offering transformative solutions and enhancing efficiency, productivity, and user well-being.

**Healthcare:** The AI Pin monitors vital signs, provides medication reminders, and offers personalised wellness recommendations, revolutionizing patient care and health management.

**Productivity Enhancement:** By analysing work habits, environmental factors, and task priorities, the AI Pin optimizes workflows, boosts productivity, and facilitates seamless collaboration within teams and organizations.

**Virtual Assistance:** Integrated with virtual assistant capabilities, the AI Pin handles queries, schedules appointments, and automates routine tasks, acting as a personalized digital assistant tailored to individual needs.

**Personalized Recommendations:** Leveraging AI-driven insights and user preferences, the AI Pin recommends products, services, entertainment content, and experiences, enhancing consumer satisfaction and engagement. This section delves into the technical intricacies that enable the AI Pin to deliver real-time intelligence, context-awareness, and personalized services.

Furthermore, it explores the potential future implications of AI-integrated wearable technology, envisioning scenarios where AI Pins catalyse advancements in smart cities, personalised learning, augmented reality experiences, and more.



Fig 4.2: Applications of AI PIN

### Conclusion:

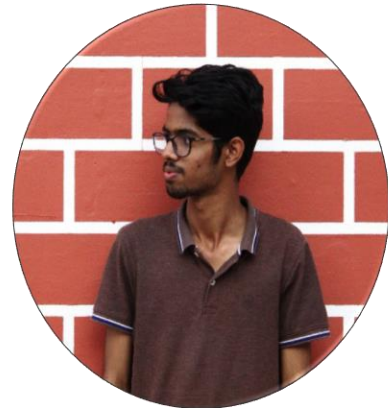
In conclusion, Humane's AI Pin transcends traditional boundaries of wearable technology, ushering in a new era of intelligent, context-aware devices that augment human capabilities and experiences. By seamlessly integrating AI algorithms, interactive interfaces, and context awareness, the AI Pin not only enhances productivity and convenience but also fosters deeper human-machine symbiosis. As we embrace the transformative potential of AI-integrated wearables, we pave the way for a future where technology adapts to human needs, preferences, and contexts, revolutionizing how we interact with the digital world. Humane's AI Pin stands as a beacon of innovation, heralding a future where intelligent assistance and personalized experiences redefine the fabric of daily life.



## REVOLUTIONIZING USER EXPERIENCES WITH HUMANE'S AI PIN: A FUSION OF AI AND WEARABLE TECHNOLOGY



Fig 4.3:AI PIN



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## EMPOWERING ENGINEERING

### Introduction:

In today's rapidly evolving world, engineering has evolved into much more than just problem-solving. It has become a catalyst for empowerment and transformation, shaping our dynamic world through innovative designs. Engineers are at the forefront of crafting solutions that not only tackle the challenges of today but also envision the possibilities of tomorrow. This article takes a deep dive into the realm of engineering, highlighting its pivotal role in driving progress and fostering resilience in an ever-changing global landscape. Through case studies and insights from industry

experts, we will explore the profound impact of engineering designs on the dynamic world we inhabit.



Fig 5.1:Empowering Engineering

One of the key areas where engineering plays a critical role is in the development of sustainable infrastructure. As the world grapples



# EMPOWERING ENGINEERING

with climate change and the need for renewable energy sources, engineers are leading the way in designing and implementing solutions that reduce our carbon footprint. From eco-friendly buildings that utilize natural light and ventilation to smart grids that optimize energy distribution, sustainable infrastructure is revolutionizing the way we live and interact with our environment. Cutting-edge technologies are another realm where engineering is driving significant progress. Engineers are constantly pushing the boundaries of innovation to develop breakthrough technologies that improve our lives.

Whether it's the development of autonomous vehicles that enhance transportation efficiency or the advancements in artificial intelligence that revolutionize various industries, engineers are instrumental in bringing these transformative technologies to life. By combining their technical expertise with a deep understanding of human needs, engineers are creating solutions that make our world safer, more efficient, and more connected.

## Prompt Engineering Process:

To truly understand the impact of engineering designs, let's delve into a case study. Consider the construction of the Millau Viaduct in France. This engineering

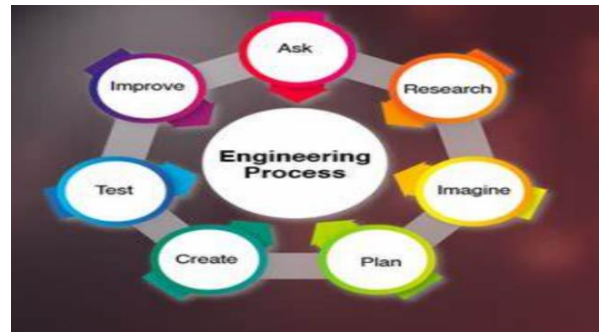


Fig 5.2:-Engineering Process

marvel stands as the tallest bridge in the world, spanning the Tarn River Gorge. The viaduct not only showcases the ingenuity of engineering but also has a profound impact on the local community. It has significantly improved transportation between regions, reducing travel time and congestion. Moreover, the viaduct's unique design has become an iconic symbol, attracting tourists from around the world and boosting the local economy. This case study exemplifies how engineering designs can reshape not only physical landscapes but also economies and societies.

## Booming of Prompt Engineering:

In the face of an ever-changing global landscape, engineering is crucial in fostering resilience. Engineers are constantly developing solutions that enhance our ability to adapt and respond to challenges. Whether it's designing resilient infrastructure that can withstand natural



# EMPOWERING ENGINEERING

disasters or developing technologies that improve disaster response and recovery, engineers are instrumental in building resilient communities. By prioritizing sustainability, innovation, and inclusivity, engineering designs are empowering individuals and communities to thrive in the face of adversity.

**Prompt Engineering** involves various **techniques** aimed at optimizing the inputs provided to AI models to produce desired outputs. Here are some common prompt engineering techniques:



Fig 5.3: Prompt Engineering Techniques

- 1. Keyword Selection:** Choosing relevant keywords or phrases that guide the AI model towards generating appropriate responses. Keywords can influence the focus and context of the generated content.
- 2. Prompt Length:** Adjusting the length and complexity of the prompt to provide sufficient context for the AI model while avoiding unnecessary information that may confuse or dilute the intended message.

**3. Prompt Structure:** Designing the structure of the prompt to convey clear instructions or queries to the AI model. This may involve using specific formats, such as questions, prompts with placeholders, or structured prompts tailored to the task.

**4. Contextual Information:** Incorporating contextual information within the prompt to provide additional guidance to the AI model. Contextual cues can help the model understand the intent and requirements of the task more accurately.

**5. Parameter Tuning:** Experimenting with different parameters, such as temperature, top-k sampling, or nucleus sampling, to control the creativity, diversity, and coherence of the generated responses. Fine-tuning these parameters can influence the quality and style of the output.

**6. Prompt Expansion:** Expanding the prompt with supplementary information or examples to provide more context and guidance to the AI model. This can help improve the relevance and accuracy of the generated content.

**7. Prompt Iteration:** Iteratively refining and adjusting the prompt based on the model's responses and feedback. Prompt iteration involves analyzing the model's outputs, identifying areas for improvement, and modifying the prompt accordingly to achieve better results.





# EMPOWERING ENGINEERING

8. **Bias Mitigation:** Addressing biases present in the data or the model's responses by carefully crafting prompts to encourage fairness, diversity, and inclusivity in the generated content. This may involve using debiasing techniques or adjusting prompts to counteract biased tendencies.

9. **Domain Expertise Integration:** Collaborating with domain experts to incorporate domain-specific knowledge and terminology into the prompts. Leveraging domain expertise can enhance the relevance and accuracy of the generated responses for specific tasks or applications.

10. **Evaluation and Validation:** Evaluating the effectiveness of prompt engineering techniques through rigorous testing and validation processes. This may involve human evaluation, automated metrics, or task-specific benchmarks to assess the quality and performance of the generated outputs. By employing these prompt engineering techniques, practitioners can optimize the inputs provided to AI models and enhance their ability to generate relevant, coherent, and accurate responses across various tasks and applications.

## Conclusion:

In conclusion, engineering has transcended its traditional role of problem-solving to become a driving force for empowerment and

transformation. Through sustainable infrastructure and cutting-edge technologies, engineers are shaping our dynamic world and driving progress. Their designs have a profound impact on our lives, from revolutionising how we live and work to enhancing our resilience in the face of challenges. As we continue to navigate an ever-changing global landscape, engineering will play an increasingly pivotal role in shaping a brighter future for all. So let us celebrate the creativity, ingenuity, and empowerment that engineering designs bring to our world.

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# DEEP FAKE

## Introduction:

Deepfake is synthetic media that has been digitally manipulated to convincingly replace the likeness of one person with another. Deepfake is the manipulation of facial appearance using deep generation methods. Although the creation of fake content is not new, deep fakes use powerful techniques of machine learning and artificial intelligence to manipulate or create visual and audio content that is easier to deceive.

## How is it done?

Deepfakes uses two algorithms - a generator and a discriminator - to create and improve fake content. The generator builds a training dataset based on the desired output, creating the original fake digital content, while the discriminator analyses how realistic or fake the original version of the content is. That process is repeated, allowing the generator to get better at creating realistic content and the discriminator to become better at identifying errors that the generator can correct. A combination of generator and discrimination algorithms creates a generative passed through a separator multiple times to fine-tune the realism of the final image or video.

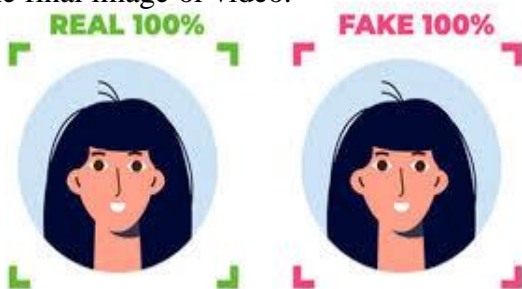


Fig 5.1: Real and Fake Images

## The Technology Required to Develop Deepfake:

Developing deep fakes is becoming easier, more accurate and more common as the following techniques are developed and improved:

GAN neural network technology is used to develop all deep fake content along with generator and discrimination algorithms. CNNs are used for face detection and motion tracking.

Autoencoders are neural network technology that detect important attributes of an object, such as facial expressions and body movements, and add those attributes to the source video.

Natural language processing is used to create a deep fake voice. NLP algorithms analyze the attributes of the subject's speech and then generate the original text using those attributes. High-performance computing is a form of computing that provides the significant computing power needed for deep forgeries.

## Where is it used ?

The use of deep fakes varies considerably. Main uses include:

- Art. Deepfakes are used to create new music using an artist's existing work. Blackmail and damage to reputation. Examples of this include items where the target image is placed in an illegal, inappropriate or otherwise dangerous situation, such as lying to the public, engaging in sexual activity or using drugs.



# DEEP FAKE

These videos are used to blackmail the victim, damage a person's reputation, take revenge or simply cyberbullying. The most common blackmail or revenge use is non-consensual deep fake porn, also known as revenge porn.

Caller answering services: These services use deep forgery to provide personalized answers to caller questions involving call forwarding and other administrators. Customer support by phone. These services use fake voices for simple tasks like checking an account balance or filing a complaint.

**Entertainment:** Hollywood movies and video games clone and manipulate actors' voices for certain scenes. Entertainment media uses it when a scene is difficult to film, in post-production when an actor is no longer on set, to record his voice, or to save time for the actor and production crew. Deepfakes are also used for satirical and parody content, where the audience realizes that the video is not original, but enjoys the humorous situation created by the deepfake. An example is Deep Spoof (2023) by Dwayne "The Rock" Johnson as Dora the Explorer.

- False evidence: This means creating false images or sounds that can be used as evidence of guilt or innocence in a court case.
- Fraud: Deep spoofing impersonates someone with personally identifiable information (PII), such as bank account and credit card numbers.

- Disinformation and political manipulation: Deeply falsified videos of politicians or reliable sources are used to sway public opinion, and in the case of the falsification of Ukrainian President Volodymyr Zelenskiy, to create confusion in warfare. This is sometimes called spreading fake news.

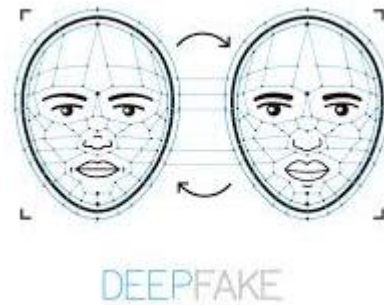


Fig 5.2: Deepfake

- Stock manipulation: Forged deep forged materials are used to influence the company's stock price. For example, a fake video of a CEO making damaging statements about his company can send that stock down. A fake video of a technology breakthrough or product launch can boost a company's stock.
- Text messages: A report by the US Department of Homeland Security, "Deepfake Identities Increasing Threat of Deepfake Identities", mentioned texting as a future use of deepfake technology. According to the report, the threats can use deep spoofing techniques to mimic a user's captioning style.



# DEEP FAKE

## Examples:

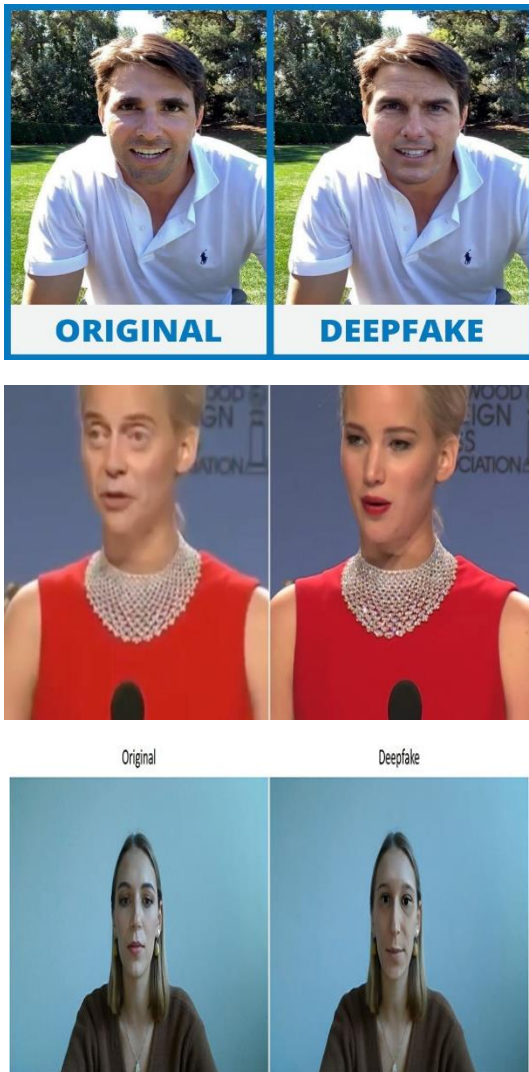


Fig 5.3: Deepfaked images

### Should we be concerned?

The spread of misinformation and fraud has long past from nonsense to a shape of warfare that could divide communities, growth polarization, and in some cases

even have an impact on elections. Geopolitical actors, ideological adherents, violent extremists, and economic support corporations will manage social media narratives with unheard of ease and scope. incorrect information has a brand-new weapon with deepfakes.

A case of bad use of depth fakes is in nude content. About ninety-six% of deepfakes consist of porn films, and there are more than a hundred thirty-five million views on the porn site alone. Deepfake content material is used in porn, especially for ladies.

Due to deep-seated deception, human beings may behave badly and say things they assume are unfair. It changed into in no way said or carried out. although the victim can divulge the lie thru an alibi or different manner, this correction may be too late to undo the original damage.

Deepfake can emerge as a powerful device for rogue international locations to undermine public protection and create uncertainty and chaos within the country. Deepfakes can undermine agree with in establishments and politics.

Non-nation actors, which includes insurgents and terrorists, may additionally use counterfeit products to incite kingdom opposition or self-imposed opposition by spreading poor narratives.



# DEEP FAKE

## Conclusion:

There's a need to reinforce media literacy efforts to foster a greater attentive target audience. Consumer media literacy is the only tool to fight incorrect information and deep fakes.

We also want meaningful rules that works with the generation industry, civil society and coverage makers to increase legislative solutions that save you the introduction and spread of harmful deep counterfeiting.

Social media structures are aware about the hassle of deepfaking and nearly they all have a few kind of coverage or proper terms of use for deepfaking. We additionally want clean-to-use and accessible era answers to discover deep fakes, authenticate media and verify authoritative resources. To combat the danger of deep fakes, all of us need to take obligation to be important media purchasers online, assume and forestall before sharing on social media and be part of the solution to this "infodemic".

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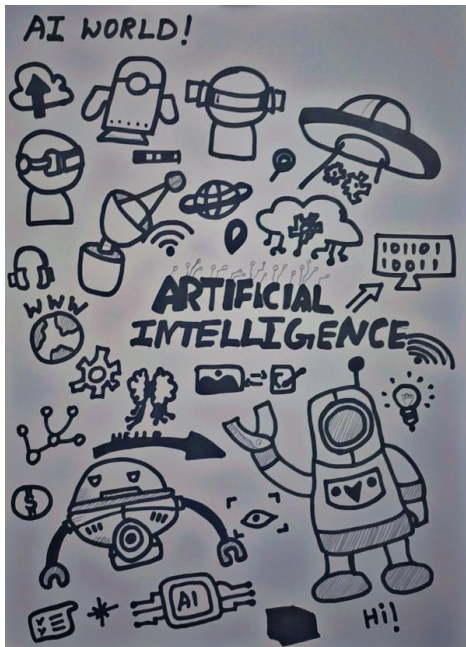
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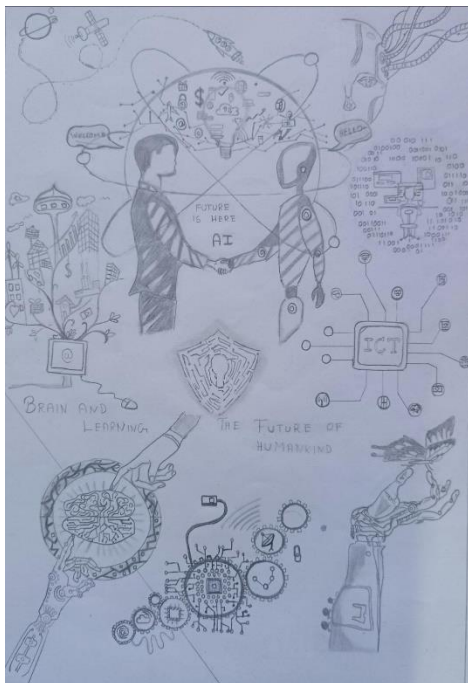
# AI World



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# Future Technology

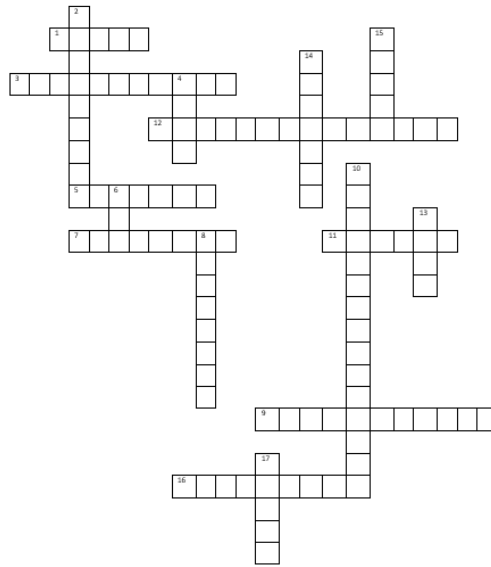


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# Word fun



\*Answer will be revealed in the next issue.

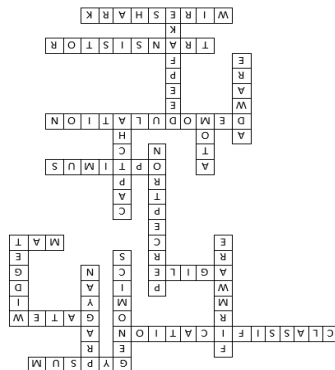
**Across:**

- 1. World’s first attempt at an autonomous AI software Engineer.
- 3. Company know for developing popular framework YOLO.
- 5. A famous javascript based UI development library.
- 7. A cyberattack where scam mails with link to malicious websites is sent.
- 8. Waves that is used to control television using remote.
- 10. Study of electronic devices that interact with light.
- 11. A platform that manages applications in the form of containers.
- 12. Technology that enables virtual version of computer hardware.
- 16. Device that converts energy into physical motion.
- 17. Technology that can create an experience of touch in computer vision.

**Down:**

- 2. A brain chip that allows humans to control external devices simply by thinking.

- 4. India’s first AI-generated school teacher robot.
- 6. Set of protocols that allows softwares to communicate with each other.
- 9. Loss of signal strength in networks.
- 13. Future of internet where decentralized networks are used.
- 14. Microsoft’s chatbot leveraging large language model.
- 15. Fundamental unit of information in quantum computing.



**Answers for previous issue:**



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