SIES
Graduate School of Technology
RISE WITH EDUCATION

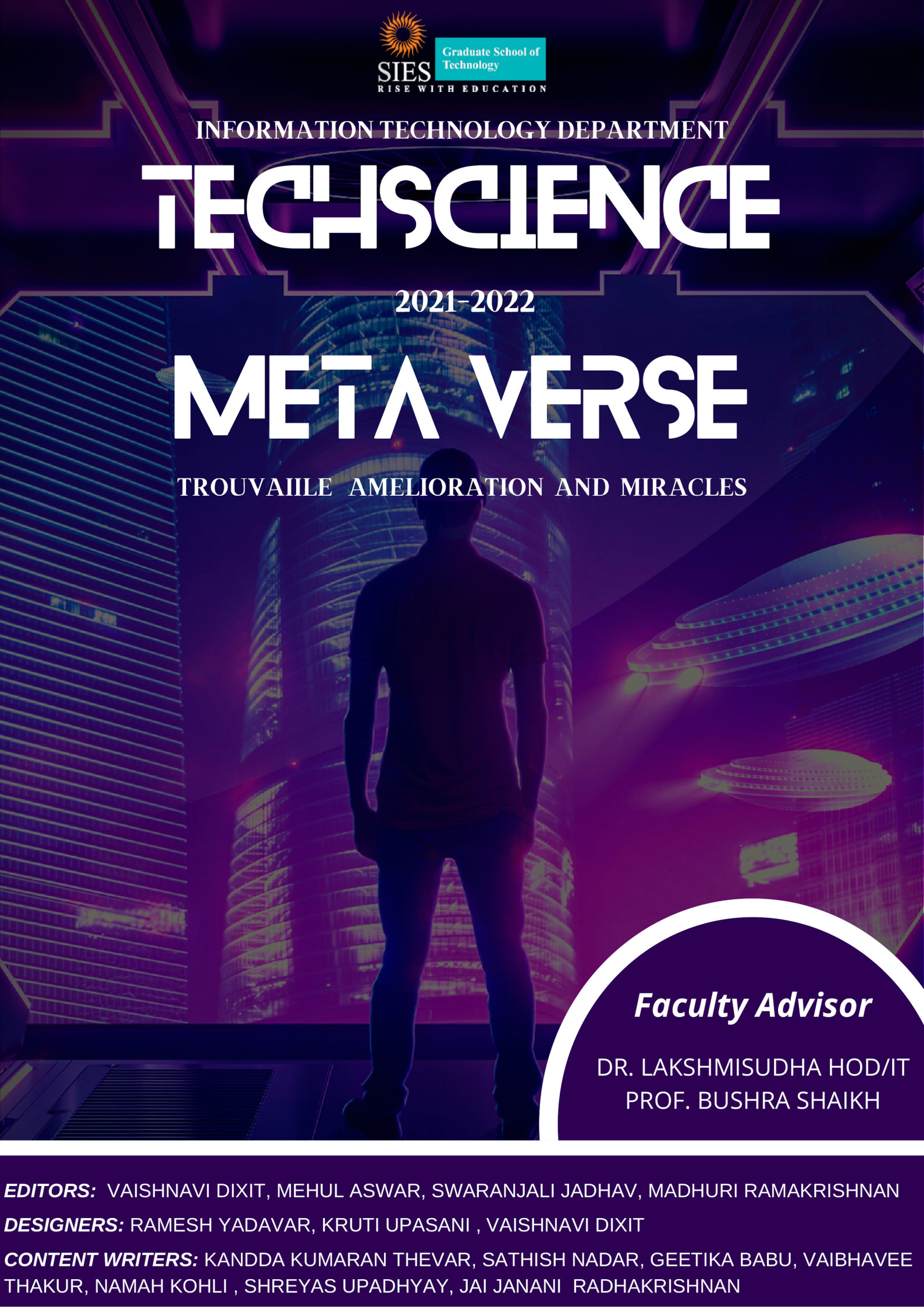
INFORMATION TECHNOLOGY DEPARTMENT

TECHSCIENCE

2021-2022

META VERSE

TROUVAIILE AMELIORATION AND MIRACLES



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Department of Information Technology

Vision

To develop IT professionals for accomplishment of industrial & societal needs through quality education.

Mission

- *To impart advanced knowledge and develop skills in Information Technology and allied fields.*
- *To enhance professional competence by inculcating values and ethics. To upgrade technical skills and also encourage research culture.*
- *To extend industry and alumni association for knowledge enhancement.*
- *To nurture entrepreneurial talent and contribute towards socio-economic growth.*

Program Educational Objectives :

Graduates will be able to:

- Compete in professional career with social and ethical responsibilities.
- Pursue higher studies/ research in Engineering & Management. Become Entrepreneurs or software professionals to satisfy the latest industrial requirements.

Program Specific Outcomes:

- *Students should be able to analyze, design and develop technological solution for a given scenario.*
- *Students should be able to involve themselves in life-long learning and cultivate skills for successful career, entrepreneurship and higher stud*

Welcome to the fifth issue of TECHSCIENCE. This term's theme is METAVERSE. Prepare yourself for a perfect fusion of literature, science, and technology.

NOTE TO READERS

Acknowledgement

Hello! Welcome to the 2021-2022 Edition of the TechScience Magazine.
Tech Science is aimed at providing you with news and info related to amazing things happening in our world related to Technology and Science It is an initiative taken by the IT Department of SIES Graduate School of Technology, Nerul, Navi Mumbai. This edition, is an effort of the faculty and students from TE and BE IT!
We're grateful to our HOD, Dr. Lakshmisudha for providing us with the opportunity and initiative and Prof. Bushra Shaikh, for being a constant mentor and guiding us in every step.
We hope you enjoy this edition and feel free to get back to us for any queries, suggestions, feedback, etc.

- Team TechScience

A NOTE BY HOD-IT

It gives me immense pleasure to inform you that the department of Information Technology is bringing out a new version of the Department Magazine TECHSCIENCE. This magazine is a perfect blend of articles related to advanced technologies. I am very happy to convey my congratulations to the team members in bringing out this wonderful magazine.

TECH SCIENCE
AN INITIATIVE BY SIES GST'S IT DEPARTMENT

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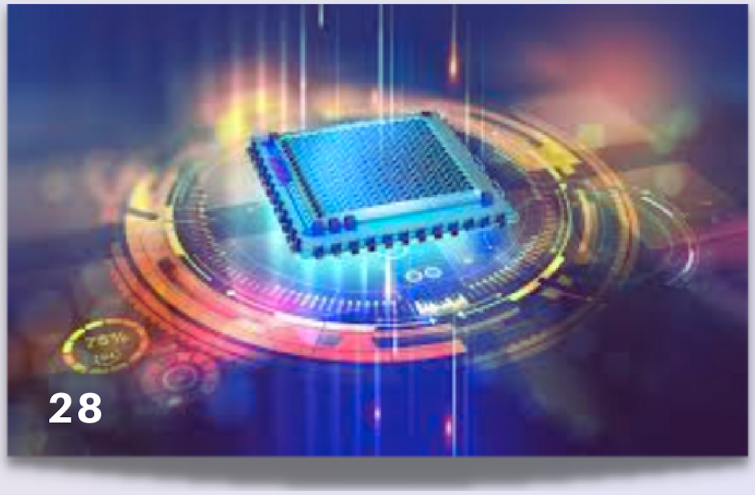
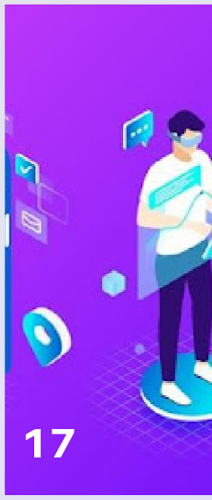




INTRODUCTION TO METAVERSE

Computer Science innovations play a serious role in standard of living as they modify and enrich human interaction, communication and social transactions. From the stance of finish users, 3 major technological innovation waves are recorded focused round the introduction of non-public computers, the web and mobile devices, severally. Currently, the fourth wave of computing innovation is evolution around spatial , immersive technologies like video game (VR) and increased Reality (AR). This wave is anticipated to make consecutive omnipresent computing paradigm that has the potential to rework (online) education, business, remote work and diversion. This new paradigm is that the Metaverse. The word Metaverse may be a closed compound word with 2 components: Meta (Greek prefix which means post, when or beyond) and universe. In different words, the Metaverse may be a post-reality universe, a perpetual and protracted multiuser surroundings merging physical reality with digital virtuality. relating to on-line distance education, Metaverse has the potential to remedy the elemental limitations of web-based second e-learning tools.

Education is one crucial field for society and economy wherever core implementation ways stay unchanged and orbiting around content transmission, school rooms and textbooks despite varied technological innovation. Currently, there's associate degree intense race to construct the infrastructure, protocols and standards which will govern the Metaverse. giant companies ar effort to construct their closed, proprietary hardware and package ecosystems thus on attract users and become the actual Metaverse destination. totally different general approaches and radiating ways collide around ideas like openness and privacy. the end result of this race can verify the extent of users' privacy rights similarly as whether or not the Metaverse are inclusive to students and college pupils. each problems have vital implications for education as they're going to verify if the Metaverse will become thought in e-learning. thus on formulate a unified vision for meta-education, Metaverse-powered on-line distance education.

A metaverse may be a network of 3D virtual worlds targeted on social association. In futurism and phantasy, it's usually delineated as a theoretic iteration of the web as one, the universal virtual world that's expedited by the utilization of virtual and increased reality headsets.

The term "metaverse" has its origins within the 1992 phantasy novel Snow Crash as a portmanteau of "meta" and "universe." numerous metaverses are developed for in-style use like virtual world platforms like Second Life. Some metaverse iterations involve integration between virtual and physical areas and virtual economies. Demand for enlarged immersion suggests that metaverse development is commonly joined to advancing video game technology.

The term has been used as meaninglessness to exaggerate the development progress of varied connected technologies and comes for packaging functions. data privacy, user addiction, and user safety are considerations among metaverses, stemming from challenges facing the social media and game industries as an entire.

The Metaverse isn't a replacement conception. However, within the context of mister, it will bridge the property of social media with the distinctive affordances of VR and AR immersive technologies. If the interaction among them is unleashed creatively, it guarantees to rework several trade sectors, among them distance online education. New models of Meta-education, Metaverse-powered online distance education, will emerge to permit wealthy, hybrid formal and informal learning experiences in online 3D virtual campuses. online learning within the Metaverse is able to break the ultimate frontier of social association and informal learning. Physical presence in an exceeding schoolroom can stop being privileged academic expertise.

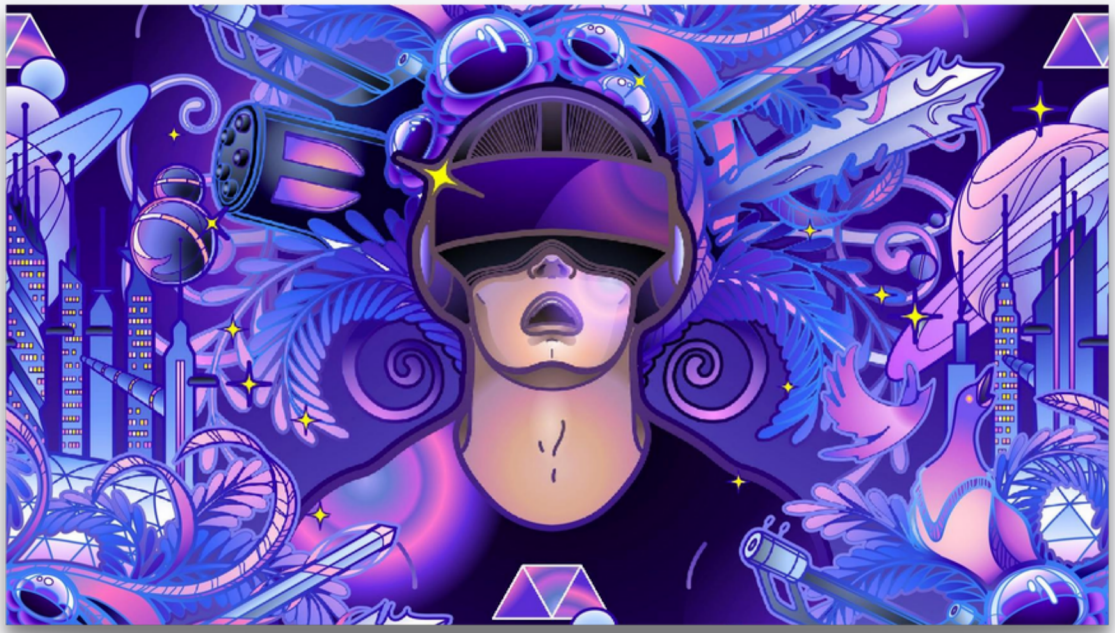
A lot significantly, it will become a democratizing consider education, sanctionative worldwide participation on equal footing, unbound by geographical restrictions.

The term Metaverse was coined by Neal Stephenson in an exceeding phantasy novel - Snow Crash -- nearly thirty years agone, within which he pictured lifelike avatars WHO met in realistic 3D buildings and different video game environments In recent years, Metaverse has come back to represent a utopian convergence of digital experiences fuelled by Moore's Law - associate degree aspiration to change wealthy, real-time, globally-interconnected virtual- and augmented-reality environments which will change billions of individuals to figure, play, collaborate and socialize in entirely new ways in which, IANS said.

The metaverse may be a logical next step from the web. From the early days once you might solely read existing info to the age of social media and creators' economy to the immersion of the virtual world into our own world. The direction of the web and data age is evident, we are going to see virtual worlds stoning up and users diving into these worlds.

The development of metaverses remains in its infancy however with fast developments, billions being endowed into this area and an enormous push thanks to COVID it'll be before long an even bigger half in our life. Even Bill Gates estimates that in precisely a handful of years, most of the work and conferences are going to be worn out the metaverse rather than physical meeting rooms and business journeys.

We can see what reasonably metaverse will take the plenty and position itself to form the a lot of required network impact. The market is all regarding “the winner takes it all” and also the metaverse may be the largest example of a digital system.



While there aren't any examples of a giant metaverse, big companies at some point claims that they have developed a metaverse. Example are as follows

1. Second live Metaverse: Second Live is that the 3D virtual world wherever users could learn, socialize, and do business by dominant avatars. A NFT marketplace for commerce collectibles is additionally a part of the concept. The second live Metaverse is believed to own hosted a finance sensible chain’s harvest competition in September 2020. The virtual aggregation allowed users to look at and move with several comes which will be found within the BSC scheme.

2.Minecraft: Minecraft, a Lego-like vice universe, has over one hundred forty million players who play it on a day to day. The firm was purchased from Microsoft, and it permits gamers to style their own persona, moreover as construct endless virtual worlds on their own, complete with digital assets and alternative options.

3. Roblox: Roblox began as a vice platform wherever users may develop their own games and share them with others. Following the event of the commerce, the Roblox are currently putting additional effort into developing their Metaverse. unitedly with labels like as Vans and Gucci, they currently give special assents to buy for your own virtual use.

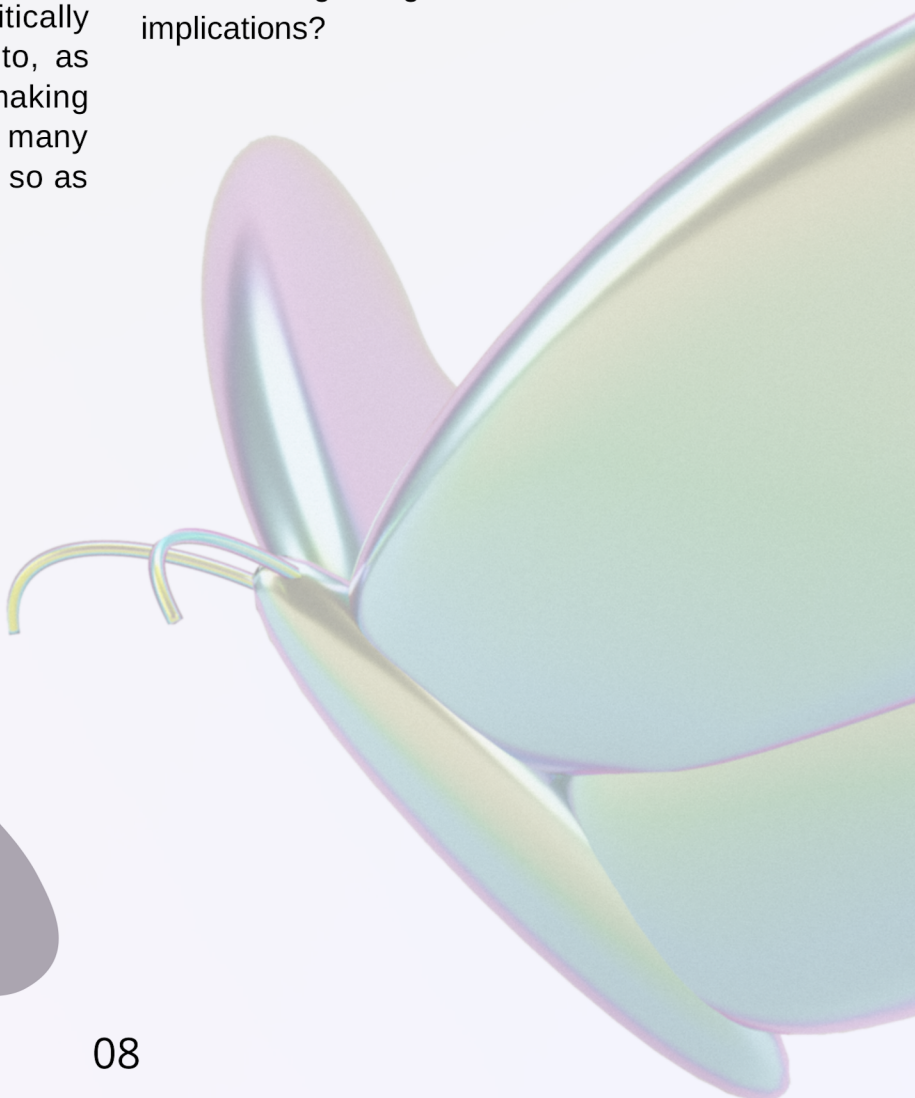
4. Microsoft Mesh Platform: Microsoft metaverse is additionally creating advances within the realms of mixed and augmented reality (XR). As a result, they conceive to introduce mixed-reality parts to groups in 2022. the key advantage with this advance is that it'll permit avatars and holograms to attend conferences, events, and maybe retail experiences and games within the future.

5. Meta Horizon Worlds metaverse: The most effective example of this kind of Metaverse could be a virtual meeting area that Facebook launched that's accessible through the corporate-owned optic. The virtual meeting area may be accessed through the horizon worlds. the key advantage of this Metaverse is that it permits you to move with peers in virtual meeting rooms victimizing your personalized avatar.

Everything sounds probably like some overhyped fantasy and there are several voices out there who see it a lot of critically and signifies that we have a tendency to, as humans, don't seem to be prepared for making such virtual worlds. The metaverse has many severe issues that require to be resolved so as to become a secure place.

Privacy, use of knowledge, psychological state issues and conjointly real-world social implications are some samples of the numerous concern areas. simply imagine if somebody features a higher life on-line than in real world, why would he wish to measure within the universe, date in universe, have youngsters, get a real-life job etc. – There are already some series and films addressing these problems that the virtual world would possibly become a lot more fascinating than the real world.

Another issue conjointly involves the “winner takes it all” result and therefore the power it may provides a single company. this suggests that virtually one corporation may have the facility to form a virtual world with its own laws, with associate degree own economic system, with own identities and evading universe rules and governance. however ought to such a corporation be treated? What regarding taxes? What regarding real-world economic implications?



WHAT'S NEXT?

Over the next few decades, the metaverse is expected to manifest itself primarily through virtual reality – an alternative, digital world that can be used for a variety of personal and enterprise purposes. Recent high-profile announcements by Meta Platforms (formerly Facebook), Microsoft, and Sony, all suggest that headsets like Meta Quest or Sony PSVR will be the consumer choices to navigate interactive and social 3D environments.

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AUGMENTED REALITY

an Ingenious, Interactive, Real-World Experience

Pokémon Go was a huge viral hit video game, at its peak, it had about 46 million users. At some point, it was everywhere, people searched far and wide for Pokemon.

What was involved in this Pokémon Go?

Augmented Reality!

Pokémon Go wasn't the first nor the last of AR applications. The start of AR technology dates back to 1968 when it was first developed at Harvard.

So, what is this Augmented Reality?

AR permits virtual objects to be overlaid in real-world environments in real time. Augmented Reality is outlined because of the technology and ways that enable overlaying of real-world objects and environments with 3D virtual objects using an AR device, and permit the virtual to act with the real-world objects to form meant meanings.

Is this Augmented Reality and Virtual Reality the same?

Unlike virtual reality which tries to recreate and replace a complete real-life environment with a virtual one, augmented reality is concerned with enriching a picture of the important world with computer-generated pictures and digital data. It seeks to vary perception by adding video, infographics, images, sound, and alternative details.

Is there a way using which AR creates such interactive real-world experiences?

Yes! Inside a tool that makes AR content; virtual 3D pictures are overlaid on real-world objects supported by their geometrical relationship. The device should be able to calculate the position and orientation of objects regarding others. For example, it is very easy to style, improve and create a dream home for any person using IKEA AR app.

On the opposite aspect, there are devices worn by the user to permit the viewing of AR content by a user. Not like virtual reality headsets that fully immerse users into simulated worlds, AR glasses don't. The glasses enable adding and overlaying a virtual object onto the real-world object, for example, inserting AR markers on machines to mark repair areas.

Will AR have any significant impact on the Healthcare sector?

Elsewhere, augmented reality's edges may be the health care sector, wherever it may play a significantly larger role. One technique would be through apps that modify users to check extremely elaborate, 3D pictures of various body systems once they hover their mobile device over a target image. As an example, augmented reality can be a robust learning tool for medical professionals throughout their training. Some specialists have long speculated that wearable devices can be a breakthrough for increased reality. Whereas smartphones and tablets show a little portion of the user's landscape, sensible eyewear, as an example, could give an additional complete link between real and virtual realms if it develops enough to become thought.

Augmented reality is employed to reinforce natural environments or things and provide perceptually enriched experiences. Augmented Reality is any artificial expertise that adds to the existing reality. This combines the advantages of each augmented reality technology and heads-up show technology.

WHAT'S NEXT?

In a few decades, there can be an increase in the use of augmented reality in improving people's standard of living. It can also be embraced for different applications in education. This often deals with the tendency of people to teach and learn easily. For elementary school students, any subject — even physical education — may be assisted by the rising enhancements in augmented reality.

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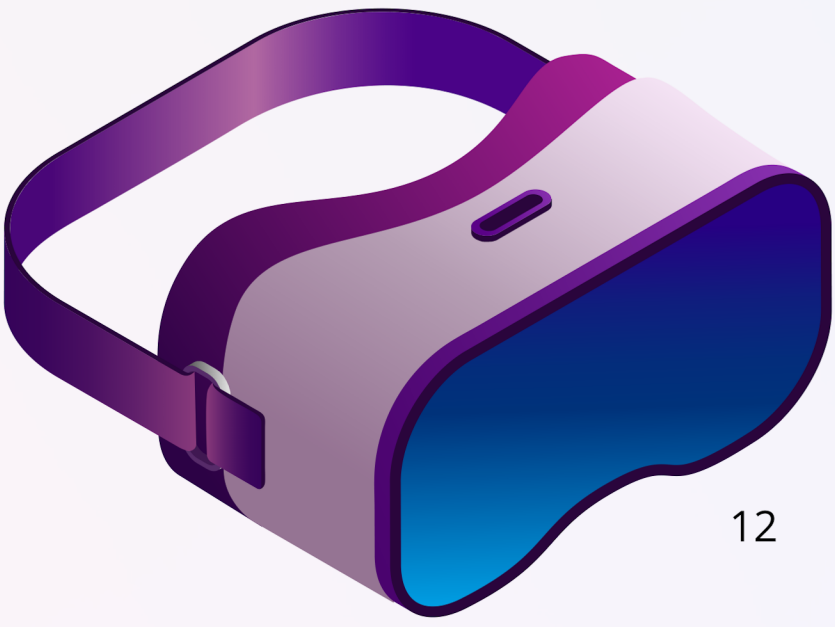
VIRTUAL REALITY

& It's application in real life

The definition of virtual reality originates from the definitions of both ‘virtual’ and ‘reality’. "Virtual’ implies close to and reality implies the conditions seasoned by people at large. hence the term ‘virtual reality’ primarily implies ‘near-reality’.

Virtual Reality (VR) is the employment of engineering to develop an artificial atmosphere. virtual reality situates the user among associate expertise, contrary to traditional user interfaces. instead of simply glimpsing a screen before them, the users are engaged and allowed to converse with 3D worlds. By replicating most of the senses like vision, touch, smell, and hearing, the pc is formed to function as a threshold into an artificial world.

Virtual reality technology permits the creation of virtual expertise to replicate real-life eventualities or develop a virtual world consisting of non-realistic components like in games providing participation in numerous things with riskless decisions.



The expense of executing this example in world isn't advantageous in comparison with the anticipated ROI however with the help of virtual reality (VR) and augmented Reality (AR) technologies, all the augmented applications will prevent the expense of augmented these things for various functions like coaching of workers, merchandise path, examining of locations, projects trial and numerous alternative functions, which may be accomplished through the personalised use of those technologies.

Alongside AR and VR applications that are benefitting numerous business fields, some samples of VR image instrumentality that may be accustomed expertise video game are Google Cardboard, Samsung Gear VR / VR further as sensory receptor Rift

Applications of Virtual Reality (VR) is from the military to sports, to mental health, to our daily lives, Virtual Reality is seeping its way through every sector.

Both the military from the united kingdom as well as the U.S. have utilized virtual reality in their coaching because it permits them to require up a large vary of imitations.

Virtual reality is used for all departments of service starting from the navy, the army, the air force, and marines to the coast guard. virtual reality will effectively transport a novice into a spread of variable situations, locations as well as environments to facilitate training. VR is utilized for military functions like simulations of flights, vehicles, and therefore the battleground, medic training, to form a virtual camp, and so on. It aids the scholars in conversing along, within the section of a 3D environment. the scholars also can be carried on virtual field journeys like to museums, embarking on tours of the solar system further as traveling back in time to varied eras. the computer game will persuade be specifically advantageous for college students having special desires. analysis has discovered that VR may persuade be a noteworthy platform to securely train youngsters and teach them social skills as well as youngsters having syndrome disorders.

For instance, the technology company, Floreo, executed virtual reality situations that enable youngsters to soak up and train themselves with skills like creating eye contact, and inform further developing social connections. virtual reality has been steadily shifting the sports industry for all its participants. This technology will be utilized by coaches further as players for training effectively across numerous sports, with them having the ability to look at further expertise explicit scenarios repeatedly and enhancing their performance every time. VR technology isn't solely aiding in enhancing the standard of medical training however conjointly holds the potential to optimize expenses.

The top of applications is simply one or two instances of how virtual reality technology is being adopted. The capability controlled by technology is unlimited and unflawed. aboard these applications, the technology is additionally being executed in mass communication fields like Cinema and entertainment, Research, Health & Safety, Heritage & archeology, etc.

Gaming

This is one space wherever VR has been used since the 1990's. However, 2016 is pegged because the year when VR gaming may truly kick off. There are such a lot of games already offered for various VR platforms. variety of developers as well as Valve and Sony have declared support for VR and are set to announce dedicated games. enhancements to smartphone displays and process have additionally spread out the approach for smartphone connected VR headsets for gaming.

Virtual tourism

Since VR shows a 360-degree view, using it for virtual tourism could be a no-brainer. VR demos of monuments, museums and fashionable popular destinations seemingly variety within the thousands. you'll be able to start with the foremost basic Google Cardboard (or similar headsets) and your smartphone. simply seek for VR within the app store and you'll notice what you wish. can it have an effect on real tourism? perhaps — however a minimum of it's plenty more affordable than truly move the world!

Crime Scene Reconstructions

VR has the power to place you in a very completely different place and time. will be} good for crime scenes as a result of it can facilitate notice and analyze one thing that was lost earlier. Scenes can be photographed in 360 with advanced cameras and a series of events is reconstructed at a later stage. The investigator are going to be ready to placed on an easy set of VR glasses and appearance around to find additional clues. this is often even additional necessary once a criminal offense scene's integrity won't last — like on a busy street or inside.

Movies

When you placed on a VR headset, it blocks all the ambient light and distractions in order that your experience isn't ruined. This makes VR an excellent choice for watching videos and films — it will truly cause you to feel as if you're sitting in a very movie theatre, complete with seats and a screen. Netflix already encompasses a VR app, compatible with Samsung's Gear VR headset. It shows content in 720p HD resolution.

Advanced healthcare

CT scans will pinpoint anomalies with nice accuracy. the matter is, doctors have to be compelled to view these scans on flat screens and prints. With VR, doctors will see scans in abundant larger detail and manipulate them in 3D area at will. this can mean a quicker and better diagnosis. alternative applications in drugs medicine remote surgical tools, safe coaching of health care professionals and in some cases, even treatment of patients

Military training

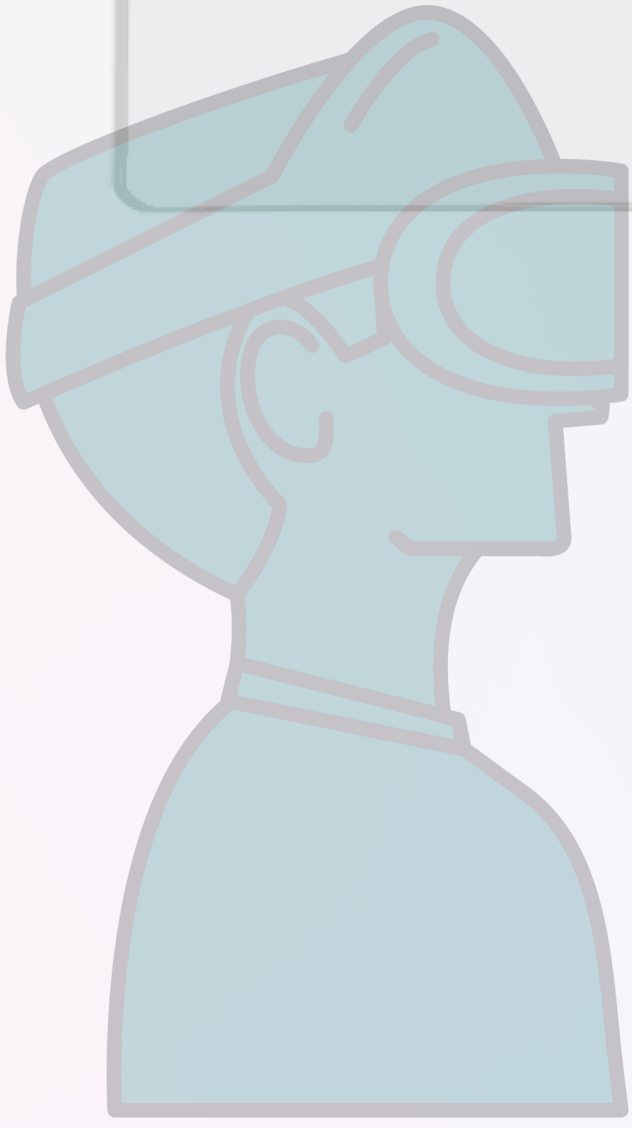
What makes the perfect soldier? It's training — the maximum amount as potential. VR will supplement the particular training, putting troopers in a very safe atmosphere whereas simulating all potential things and enemies. this is often presently being through with flight simulation and battlefield simulation. Advanced moving VR rigs can even place troopers on moving platforms for higher simulation.

Drone management

Drones are hot property and despite the anomaly around their use in many parts of the world, numbers are solely increasing. VR provides some way to regulate a drone even after you can’t see it. it's currently potential to send a drone on a reconnaissance mission – it'll send a live feed from its cameras to your VR headset in order that you'll be able to remotely manage it. companies like FLYBi, Ghost Drone and CloudLightFPV have consumer-ready products go into this area.

What's Next

Over the next few years, in VR, as altogether fields of technology, we’re progressing to see things that create what's cutting-edge nowadays appear as if space Invaders. And though the games are wonderful, the results of this transformation are so much broader, pertaining to our work, education, and social lives.



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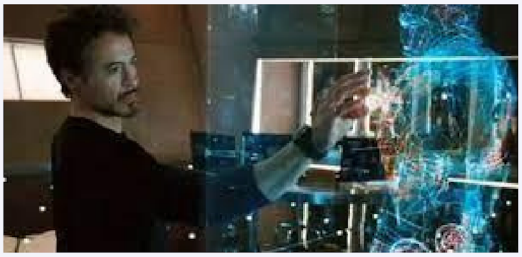
VIRTUALITY EXTENDS TO REALITY IN THE NEAR FUTURE?

Ever played or even heard of Saints & Sinners?? - a game unlike any other in The Walking Dead universe. I'm sure each one of us visualizes ourselves with a headgear on, fighting the undead, scavenging through the flooded ruins of New Orleans, and facing gut-wrenching choices, as if we were in an entirely different realm – a "NOT REAL" world, a Virtual World that cuts our auditory & optical senses off the real world. This is VIRTUAL REALITY!

Furthermore, a great deal of people follow Marvel. Tony Stark (a.k.a. Iron man), one of Marvel's most beloved superheroes, is a technological wizard. The concept of AUGMENTED REALITY comes courtesy of Iron Man's Heads Up Display (HUD), which is first introduced with Tony Stark's first flight in the Mark II suit. From a storytelling standpoint, the HUD serves as a unique point-of-view for the audience, but it also gives us a tantalizing look at how augmented reality headsets and smart glasses will eventually assist users in the real world.

We find many more instances of AR in Marvel's Avengers sequel, wherein, direct or indirect view of a real-world environment's elements are augmented (or supplemented). Another very popular example of AR is Pokemon Go.

Now reminiscing about Tony Stark explaining to the MIT audience (Captain America: Civil War), the fictional technology reads the subject's memories and, with a combination of light projectors and a pair of glasses, renders a more pleasant version of events into the physical space as a means of psychotherapy, where, Virtual and Real World "coexist" and the "virtuality" brings about a change in the real world. This is a MIXED REALITY!



A cut above, Extended Reality (XR) is an umbrella term encapsulating Augmented Reality (AR), Virtual Reality (VR), Mixed Reality (MR), and everything in between. Imagine you are shopping for a new home anywhere in the world as if you were actually on-site or head to lunch in some faraway land.

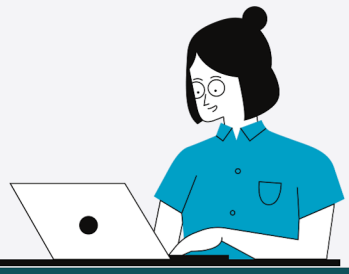
This tremendous growth could mean the realities of our 2030 lives are beyond our imagination's ability to grasp. Some of the sectors which might experience metamorphosis due to XR – Retail (giving customers the ability to try before they buy), Training (Especially in life-and-death circumstances), Marketing (engaging with prospective customers and consumers), Real Estate (finding buyers or tenants might be easier if individuals can "walk through" spaces), Product Design and Development and Entertainment (may be some Marvel movie, because Marvel has always been ahead in using different and new technologies, leaving the viewers in awe.)

What's Next?

Achieving the vision of sleek, comfortable, and fashionable XR glasses that are immersive, intelligent, and always connected is extremely challenging. There are various technical problems that need to be solved for XR to reach mainstream adoption.

- XR needs a disruptive revolution in display technology to show richer visual content, and to switch seamlessly between real and virtual worlds.
- Making virtual objects in augmented worlds indistinguishable from real objects is a tremendous challenge, especially under diverse lighting conditions.

- Meeting the always-on, compute-intensive workloads of XR within the power and thermal constraints of sleek XR glasses is very challenging.
- Seamless and ubiquitous connectivity to the internet and cloud services is required for XR to reach its full potential.
- Intelligent on-device tracking of our head, hands, and eyes is required to interact intuitively with our XR glasses and create immersion.



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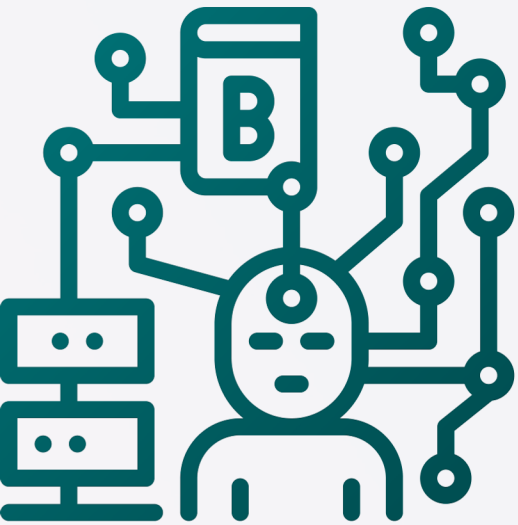
BURSTING MYTHS

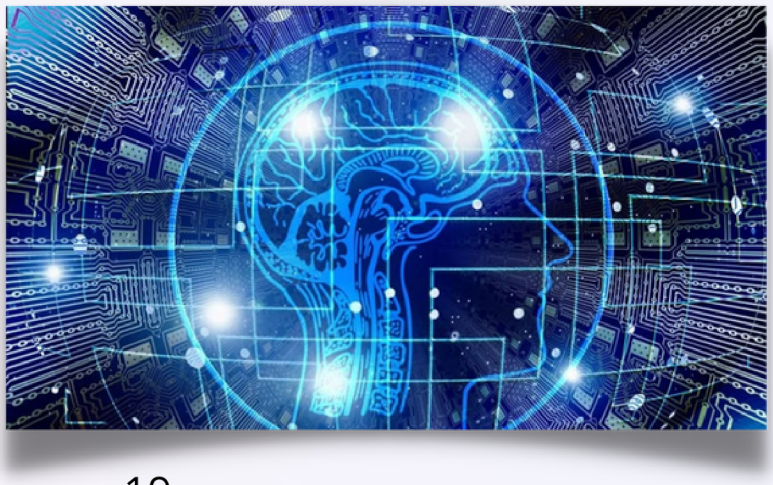
AI, ML & DS ARE ONE AND THE SAME



You might have heard these words Machine Learning, Data Sciences, Artificial intelligence and what not which generates computer-based information that permits recognized music streaming platforms to prescribe artisans and melodies to clients or OTTs to comprehend what shows you would like to see straight away. As we see nowadays, we can even hangout with our friends virtually where our avatars interact with each other. Or you can buy or sell things in a virtual world. Isn't that quite fascinating??

What is Ai?

Well as we all know Artificial Intelligence the ability of a digital computer or computer-controlled robot to perform tasks similar to that of human intelligence. The majority of tasks related to human intelligence is the ability to reason, discover meaning, generalize, or learn from past experiences. Since the development of the digital computer has begun it has been demonstrated that computers can be programmed to carry out very complex tasks with great proficiency. As we believe we have advanced in the means of computer speed and memory capacity, there are still no programs which can match the human's flexibility over wider domain or in tasks which require human knowledge.But as we all know if we complete a task with complete dedication we can attain the performance levels of human experts and professionals in performing certain specific tasks, hence we can state that artificial intelligence in this limited sense is found in applications as diverse as medical diagnosis, computer search engines, and voice or handwriting recognition.



What is DS?

Data science basically is the domain of study that deals with vast volumes of data using modern tools and techniques to find unseen patterns, derive meaningful information, and make business decisions. Data science uses complex machine learning algorithms to build predictive models which analyze the data. The data used for analysis can be extracted from many different sources and is presented forth in various formats.

Studies have revealed that 90% of the entirety of the world's data has been created within the previous two years. Whatt??? 90% in just two years?? Yes, we've collected and processed 9x the amount of information than the previous 92,000 years of humankind combined. And it isn't slowing down. It's projected we've already created 2.7 zettabytes of data, and by 2020, that number has reached an astonishing amount of 44 zettabytes. The field is growing so rapidly, and revolutionizing so many industries, that it has been difficult to fence in its capabilities with a formal definition, but generally data science is devoted to the extraction and analysis of clean information from raw data for the formulation of actionable insights. Data has incalculable benefits in business, research and our everyday lives. Anything and everything that we do like our route to work, our most recent Google search for the nearest coffee shop, our Instagram post and even the health data from your fitness tracker are all important to different data scientists in numerous ways. Sifting across massive lakes of data, looking for connections and patterns, data science is responsible for bringing us new products, delivering breakthrough insights and making our lives more convenient.

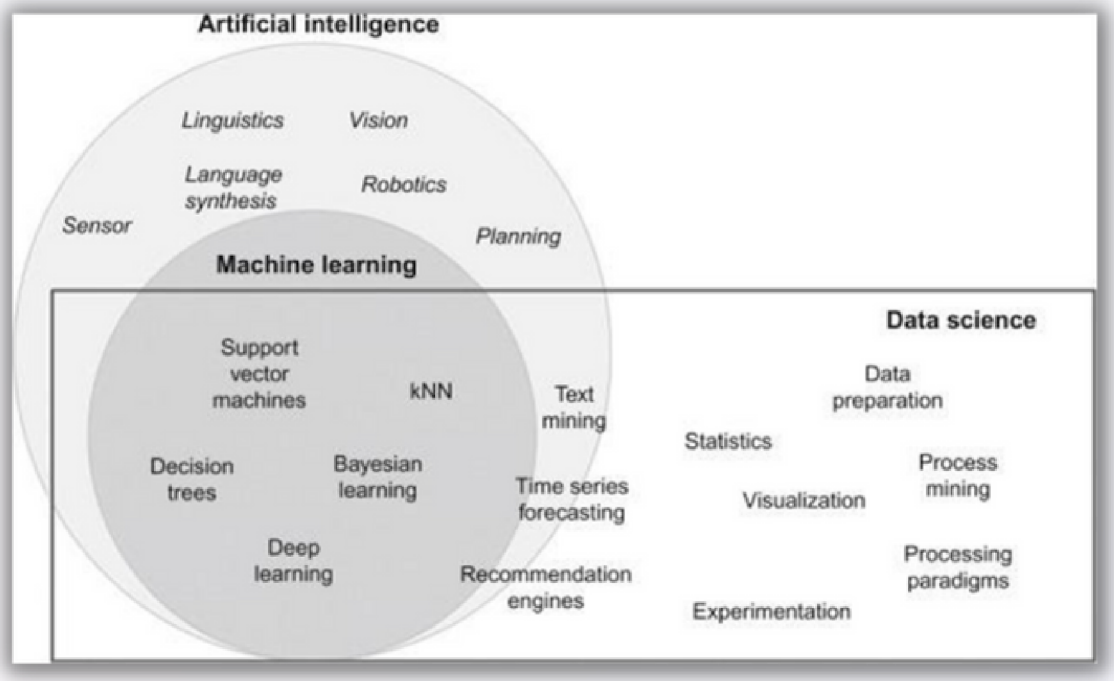
What is ML?

Machine learning (ML) is said to be a type of artificial intelligence (AI) that allows software applications to become more accurate at predicting outcomes without being explicitly programmed to do so. Machine learning algorithms use historical data as input to predict new output values as we stated that these fields help us explore by giving recommendations of similar content that we usually tend to watch. Recommendation engines are a common use case for machine learning. Other popular uses include fraud detection, spam filtering, malware threat detection, business process automation (BPA) and Predictive maintenance and many more things yet to discuss.

How are they related?

Well when we talk about Machine learning and Artificial Intelligence it is said that ML in the wider perspective is the subset of AI and a greater chunk of AI is not machine learning. Machine learning uses algorithms which help us perform AI related tasks. AI is a technology that has a goal of creating intelligent systems that can simulate human intelligence while Machine Learning is one of these ways systems can be made to acquire a particular form of human intelligence. Artificial Intelligence Machine Learning are Overarching fields while the aim is still to simulate human intelligence to solve complex problems.

The goal is to learn from data and be able to predict results when new data is presented or just figure out the hidden patterns in unlabeled data which actually attempts to find the optimal solution. Moving forward when we combine more than just AI and ML i.e with DS we figure out these words which are interchangeably used having quite a few things in common rather than being similar. The image displays that neither AI nor ML is a subset of DS or vice versa. While there is a lot more in the field of data science than in AL or ML collectively. It is said that there are certain AI concepts which may not happen to be ML techniques but are employed in the field of Data Science. For example, Text mining is an AI technology that uses Natural Language Processing to transform the raw and unstructured text in documents and databases into normalized, structured data suitable for analysis or to drive Machine Learning algorithms.



WHAT'S NEXT?

This field of Data Science, Artificial Intelligence and Machine learning will flourish more and more as companies become increasingly data-centric and slowly become aware of data's true importance and potential. Data scientists can contribute to massive developments in products and services, only increasing their importance more and hence there will be a massive amount of data scientists in future. There might be an instance where there will be more jobs for data scientists than the amount of people. This is possible as we are looking into a world with advancements like Natural Language processing and Augmented reality which promote interactions between machines and devices. These advancements in technology have made life easier for human beings.

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PROPHESIED ARTIFICIAL INTELLIGENCE!

"Man has long feared the rise of the machine – his own creation becoming smarter and more intelligent than he."

Status Quo of AI:

Whether it's teaching new languages in a very personalized method or translating speech and text in time periods, a lot of economical forms, providing symptom checking and quick access to physicians and further to patients, or making Art, AI has changed the workforce.

There is a genuine, evidence-based phase shift from artificial intelligence as a "cherry-on-top" curiosity to a "key ingredient" at leading organizations. Adoption is significant on a per-organization basis, with 53% of those polled spending more than $20 million on AI tech and talent.

Trustworthy AI?

As more companies adopt AI, leaders have to "trust" its development, deployment, and use. While AI can deliver exponential benefits to companies that successfully leverage its power, if implemented without ethical safeguards, it can also damage a company's reputation and future performance.

Let's talk about AI:

Code-driven systems have unfolded data and property to over close to half of the world's inhabitants, providing antecedently undreamt opportunities and unexampled threats. As rising algorithm-driven computing (AI) continues to unfold, can individuals be happier than they're today?

AI is not new. AI was a term 1st coined at Dartmouth College in 1956. So, what specifically has changed, and why are we talking so much about it right now?
AI has forever looked as if it would be a catch-all term for "whatever computers can't do", however, we focus on the face of its boost and the list of a myriad of tasks that AI will do these days. It seems as if this list of "can do's" has reached a crucial mass, shifting AI to the forefront of executives' decision-making and strategic growth designing. AIs move up-the-worth chain as they elevate from reactive order-takers to proactive change-makers. The promise of "*always-on, always-connected*" has gone from R&D speculation to marketing. The ever-present immersion has materially changed our minds in technological support.

Guardrails to guide the future of AI:

Despite our optimistic projections of these artificial intelligence future possibilities, it's important to acknowledge that there are many milestones still needing to be met—and many roadblocks to be overcome;

1. Who is accountable for making sure that AI is developed and enforced in an exceedingly honest, safe, and moral way?
2. Will AI pose a threat to our privacy and security?
3. Does AI threaten people's livelihoods?
4. Who will be trusted to regulate and incentivize?

What's Next?

AI inside us:

There's no getting around it: The idea of chips in our brains is jarring. Talking to a computer might be faster than typing on one, but both pale compared to the prospect of "thought control." Today, for example, research teams are working with paraplegics to use nascent neuromuscular implants to help them regain the use of their limbs, as well as with the blind and deaf to help them approximate sensations of sight and sound. We can only speculate as to the increased nuance and intensity of the debate as we evolve from muscular augmentation to cognitive augmentation.

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NEGATIVE EFFECTS OF AI

Every coin has two sides, mostly its positive or negative but this complexity changes drastically when we apply it to technology and specially when we talk about technology so advanced that even we who invented it are still trying to find the extent of it. Artificial Intelligence or as we commonly know it as AI is the ability of a computer or computer-controlled robot to perform tasks commonly associated with intelligent beings. The term is frequently applied to the project of developing systems endowed with the intellectual processes characteristic of humans, such as the ability to reason, discover meaning, generalize, or learn from past experience.

The foundation of AI is algorithms and these algorithms are designed by us humans. The organization who creates these algorithms may intentionally create a biased algorithm which will benefit the organization or specific people. But this is not the only case, algorithms which are used for AI are very complex and therefore an Biased algorithm might occur unintentionally. Biased algorithm once implemented can affect all the decisions which are taken by the AI.

We have seen a real life example of this bias in October 2019 when researchers found that an algorithm used on more than 200 million people in US hospitals to predict which patients would likely need extra medical care heavily flavored white patients over black patients. For various reasons, black patients incurred lower health care costs than white patients with the same conditions on average.

Even if we overcome the problem of AI bias there is another immediate problem waiting for us and that is the shift in human experience. If AI takes over menial tasks and allows humans to significantly reduce the amount of time they need to spend at a job. This extra freedom might seem like a blessing at first glance but in order to live a normal life humans need purpose and they need to achieve this purpose on their own. Humans will need to channel their free time into something productive and this is very important not only for the physical but also mental health. We all personally went through this during the lockdown. As we all were working & studying from the comfort of our homes it bought devastating effects on our health. According to the WHO 2022 report in the two years of pandemic the heaths index of the world had fallen by 10 points which is lowest since the peak of industrial revolution. But the pandemic ended and we had time to recover but the AI taking over the jobs will be permanent.

Even if we implement AI technology successfully we need to make new laws and regulations to keep the usage of AI in check. It might sound very easy and straightforward but this is going to be a hectic and difficult task. As we still don't know the extent of this technology there might be many loopholes in the initial draft of the law. We might need to constantly upgrade this law and it might be a never ending process but if we truly want AI to be implemented then we need to take up this massive task. There have been multiple instances where the AI has broken law due to the data it was fed. It ranges from Military using them to attack high risk target, chat bots debating existential dilemmas

With new laws there will also come new criminals. There may be new AI enabled form of terrorism to deal with the expansion of Autonomous drones, robotic swarms to attack or the delivery of disease through nano robots. Not long ago the Islamic State of Iraq and the Levant (ISIL) carried out its first successful drone attack in combat, with rapid increase in sophisticated AI technologies more and more non-state armed groups around the world are gearing themself up for a battle with the government.

Till now we just touched upon the issues which are going to affect the world at large but AI will also have a very deep impact on our personal life. Today's world is very deeply connected, especially with companies collecting vast amounts of data which allows them to access consolidated data. With the help of this data they can accurately replay anybody's day-to-day life in terms of activities, interactions and explicitly stated or implicitly identified interests. With this much information these companies can easily manipulate anybody to buy products the don't need, push them towards wrong agendas, feed them wrong manipulative information which will in turn brainwash them and to do all this they don't need any specialized personal this all can be done with the help of a single AI and this will not affect one or two people but the entire planet.

WHAT'S NEXT??

From Stream Engine to Bullet trains, from Wright brother's airplane to modern Jet planes, from 1 house powers car to Super cars all human inventions were very raw in the beginning but we always found a way to make it efficient, powerful, useful and more than anything safe. AI is a long way from being fully developed and when it reaches there we would be ready for it..

Our world will take time and extensive reasoning, hard work & understanding to implement AI technologies in our daily life but we all know that this is the future. AI will help us solve the biggest and impossible problems like neurological & hereditary diseases, poverty, economic failures, global warming, interstellar travels, etc. There will be negative impacts but we will make sure that positive impacts always outweigh them. So let's gear up, we have a long way to go.

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INTRODUCTION TO QUANTUM COMPUTING AND ITS TYPES

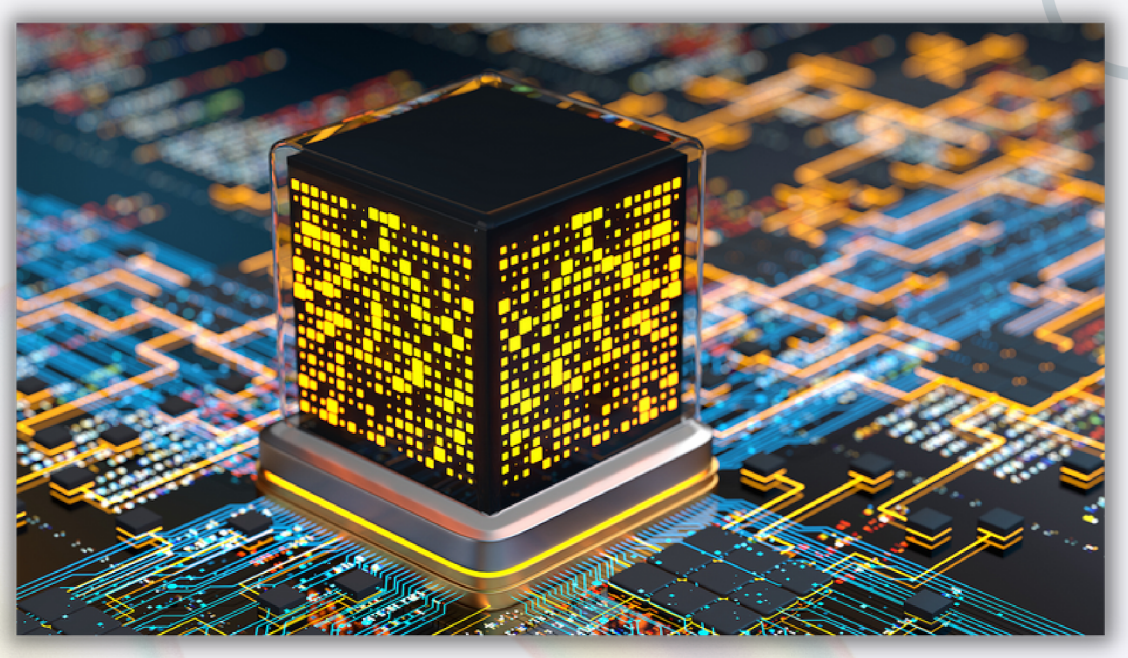
Talking about Quantum Computing, we basically start by understanding what it is based on. Not just a contemporary computing technique, it is a fusion of a lot of mind boggling and interesting concepts such as quantum mechanics, various forms of algebra in mathematics, the use of gates, and many such related concepts of information technology. What quantum computing does is control a lot of microscopic particles such as protons, neutrons, atoms, electrons, etc and create computers that are way faster than what we currently use, also saving huge amounts of energy at the same time. Still very low in number across the globe, as of 2021, India has the lowest percentage of work going on on a very vast and advanced subject of quantum computing, while countries like the USA and Canada are way ahead as of now. Various papers have been published by various authors all over the world about quantum computing which is a very complex topic and further studies are bringing in more interesting versions of just a basic idea.

The more we study an intriguing subject like QC the more we want our questions to be answered. It is no less than a universe (which obviously keeps expanding every single second, even as I write this). To understand more about it, let's dive deeper into its types and know more about its working. First, speaking about the quantum circuit model, it is derived from what we know as binary bits 1 or 0 but in more of a state that's quantum and is known as qubits. Sometimes while measuring it can also be 0 and 1. The Quantum circuit model is the most widely used QC model.

Another type of QC model is a quantum turing machine. As we know a turing machine is a powerful computational automata type that can perform any algorithm, and solve any mathematical problem that is provable and true. It can solve any given condition that can be solved by a normal computer. In turing machine we came across a thesis known as the Church-Turing Thesis. This sometimes makes the quantum computers of this type solve so many problems a lot faster so many times.

One more type of quantum computing model is the one-way quantum computing model.it performs single qubit measurements on it and is known as one way as the resources provided are exhausted or destroyed while taking measurements.

Studying about Quantum Computing will not just lead us to better solutions to so many complex problems but will also provide answers and at the same time promise many many more benefits of it.



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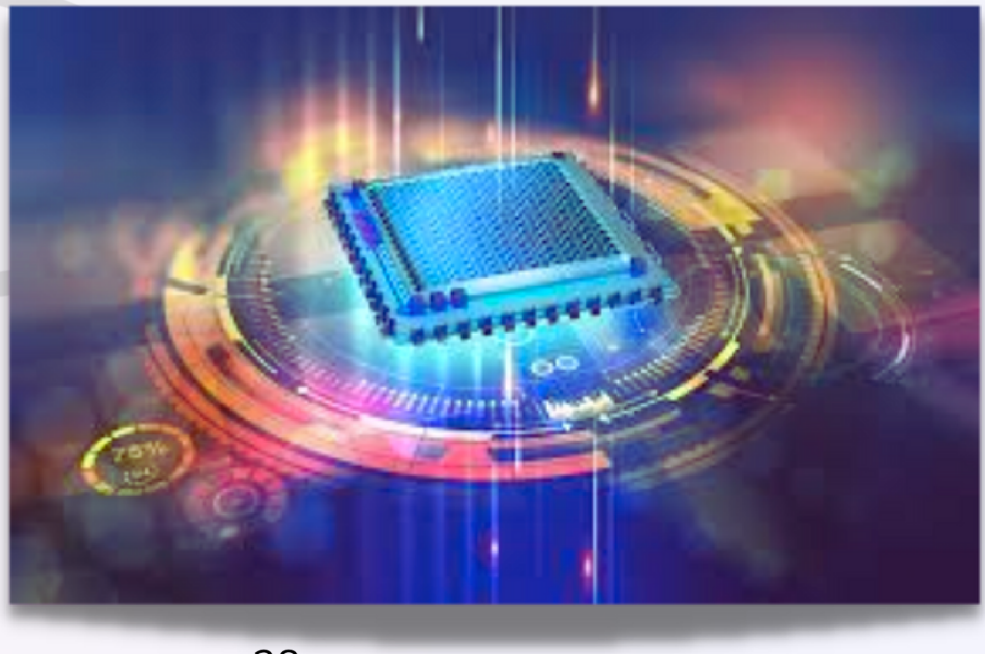
QUANTUM COMPUTERS

Origin and early developments in QC

Quantum Computing or more commonly known as QC may be under development but its initial origin traces back to 1959. Richard Feynman stated the possibility of Quantum effects in the field of computing. It is not surprising that many of the technologies which are already invented in the early part of the 20th century.

Recognizing the very people and organizations who, over several decades, cumulatively laid the foundations of quantum computing is key to understanding the wider potential of this area. Among these, Quantum Computing is one of them. Quantum mechanics was advanced between 1900 and 1925 and became a foundation that started with chemistry, condensed matter physics, and rested at an end in technologies ranging from computer chips to LED lighting. This new idea is very innovative and useful for several areas, but some of the simplest systems could not make scientists able to model with quantum mechanics. A simulating system of even a few dozen interacting particles involves more computing power than any conventional computer will take over thousands of years. Quantum computing is possibly the technology needing the greatest typical example on the part of developers. Quantum computers were proposed in the 1980s by Richard Feynman and Yuri Manin. It is also claimed that Quantum computing began in 1980 by physicist Paul Benioff proposed a quantum mechanical model of the Turing machine. But there was no headway found.



Timeline of early developments of Quantum Computing

1959 — Richard Feynman states the possibility of using quantum effects for computation

1981 — Feynman urged the world to build a quantum computer. "Nature isn't classical...and if you want to make a simulation of nature, you'd better make it quantum mechanical…"

1993 — an international group of six scientists showed that perfect quantum teleportation is possible

1994 — Peter Shor discovered a quantum algorithm, which allows a quantum computer to factor large integers exponentially much faster than the best-known classical algorithm. Shor's can theoretically break many of the Public-key cryptography systems in use today

2009 — Yale created the first solid-state quantum processor, a 2-qubit superconducting chip

2011 — scientists from Australia and Japan made a breakthrough in quantum teleportation, successfully transferring quantum data with full transmission integrity

2011 — D-Wave announced the first commercial quantum annealer

2012 — the first quantum teleportation from one macroscopic object to another was reported by scientists at the University of Science and Technology of China

2013 — Google announced that it was launching the Quantum AI Lab

2014 — Edward Snowden showed the NSA is running a $79.7 million research program titled "Penetrating Hard Targets", to develop a quantum computer capable of breaking vulnerable encryption

2015 — NASA publicly displayed the world's first fully operational quantum computer, D-Wave Systems

2016 — IBM Research announced that for the first time ever it is making quantum computing available to members of the public via the cloud

Mar 2017 — IBM announced an industry-first initiative, called IBM Q, to build commercially available universal quantum computing systems

Oct 2017 — IBM Research scientists successfully "broke the 49-qubit simulation barrier"

Early 2018 — IBM, Intel, and Google each reported testing quantum processors containing 50, 49, and 72 qubits

Jun 2018 — Intel began testing a silicon-based spin-qubit processor

Dec 2018 — IonQ reported that its machine could be built as large as 160 qubits

Oct 2019 — Google announced it had achieved quantum supremacy - marking a huge milestone in the advancement of practical quantum computing

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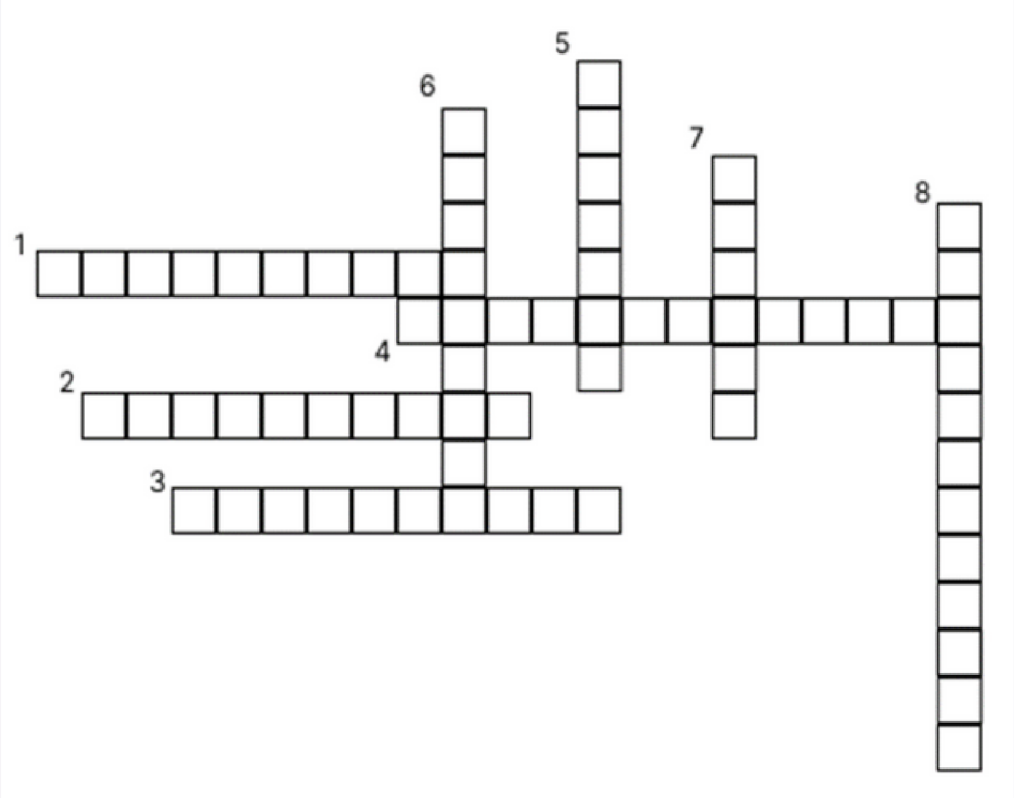
CROSSWORD



1. **The notional environment in which communication over a computer network occurs.**
2. **A system of recording information in a way that makes it difficult or impossible to change, hack, or cheat the system.**
3. **It is a hypothetical group of multiple universes.**
4. **It is a philosophical and intellectual movement which advocates for the enhancement of the human condition by developing and making widely available sophisticated technologies that can greatly enhance longevity and cognition.**
5. **A collection of series of digital audio files that are made available for downloading or listening via the internet.**
6. **It is a purported existence in which the essential part of an individual's identity or their stream of consciousness continues to live after the death of their physical body.**
7. **It is another name for the universe.**
8. **It is adding game mechanics into nongame environments, like websites, online communities, learning management systems or business' intranet to increase participation.**

Answers:

Cyberspace Blockchain Multiverse Transhumanism Podcast Afterlife Cosmos Gamification

BOOKS ON METAVERSE:

1. Snow Crash by Neal Stephenson

2. The Metaverse: And How It Will Revolutionize everything by Matthew Ball

3. The Metaverse: Prepare Now for the Next Big Thing! by Terry Winters

4. Neuromancer by William Gibson

5. A Frayed New World by Damini Rana

6. Charlie Fink’s Metaverse

7. Marching Toward the Metaverse by Timonthy C. Cunningham

8. Learning in Metaverses: Co-Existing in Real Virtuality by Eliane Schlemmer

9. The Metaverse by William J. Batts

10. What is the Metaverse?: The Virtual Future In A Guide and the Best Cryptocurrencies To Invest in 2022 by Peter Zakin

11. Ready Player One by Ernest Cline

12. Daemon by Daniel Suarez