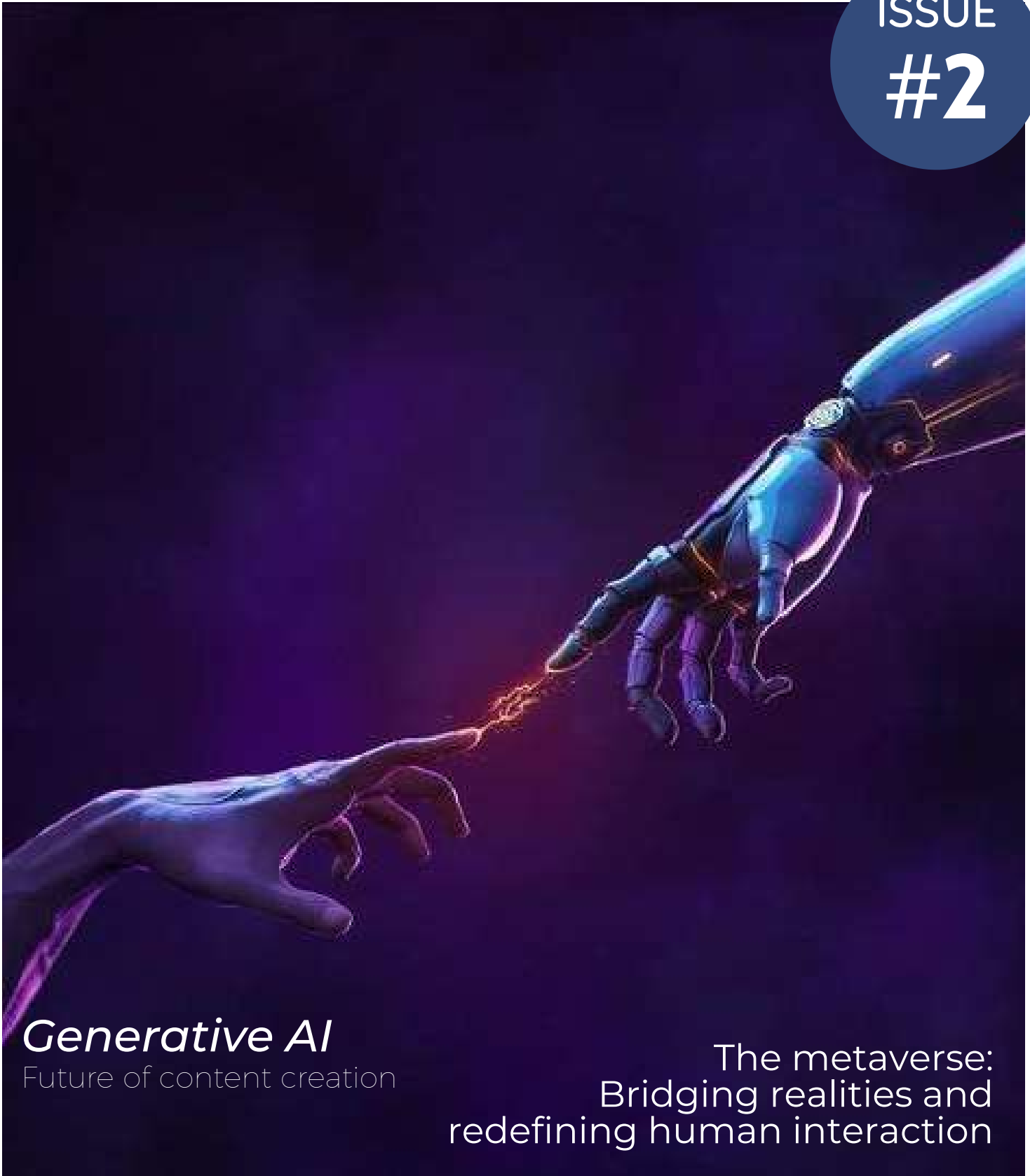


# THREADS

CSE ASSOCIATION GCEK - TECHNICAL MAGAZINE

ISSUE  
#2



***Generative AI***

Future of content creation

The metaverse:  
Bridging realities and  
redefining human interaction

MAY 2021 EDITION

# ***DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING***

## Vision

"To be a centre of excellence in the field of computer science & engineering education and research, which extends its appreciated services to the industry and the society"

## Mission

"To develop engineers with excellent analytic, design and implementation skills, who can expertise themselves as computer professionals, research engineers, entrepreneurs or as managers, while fulfilling their ethical and social responsibilities, in a globally competitive environment."

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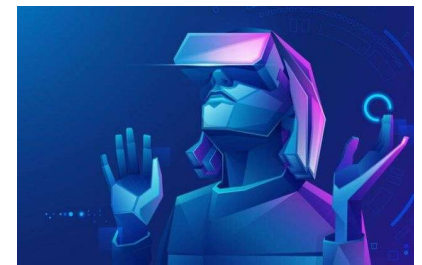
## GENERATIVE AI

*THE FUTURE OF CONTENT CREATION*



## ETHEREUM

Empowering the decentralized future



## THE METAVERSE

Bridging realities and redefining human interaction

# MESSAGE FOR THREADS

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**Dr. V O Rajini**

Principal,  
GCE Kannur

All the warm wishes for Threads, the technical magazine released by our Computer Science and Engineering department for the year 2021, It's delightful to witness the dedication students put forward to make their peers voice out their thoughts and achievements with the purpose of motivating the younger ones. May this inclusion enhance awareness of the possibilities of computer science and the emerging innovations on the horizon, such as artificial intelligence. Congratulations to the contributors and the dedicated editorial team for their unwavering efforts. Let this be a stepping stone for the next step.

**Dr. Rafeeqe P C**  
Head Of Department,  
CSE



In today's fast-paced world, it is more important than ever for students to be able to communicate their ideas effectively. This is an important opportunity for students to learn from each other and to connect with professionals in the field. Online technical magazines can also help to foster creativity in students.

I wish you all the best with the new edition. I am sure that it will be a success.

➔ **Abhinand C of S8 CSE** was honored as the best performer in HackP 21, International Hackathon organized by the Kerala Police Cyberdome.

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➔ **Anagha N of S8CSE** received the IEEE India Council 2020's Outstanding Student Volunteer Award as well as the Richard E Merwin Student Scholarship, making us extremely proud.

---



➔ **Lavanya E V of S8CSE** was honoured with the Upsilon Pi Epsilon Honour Society Award, a GHC student scholarship to attend the 2021 virtual Grace Hopper Celebration, and was also recognised as the outstanding WIE coordinator from the IEEE Malabar Subsection, making us all proud.

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➔ **Shilpa Rajeev of S8CSE** made us all proud by receiving the Carolyn Leighton Scholarship from APAC and got the opportunity to attend WITI's Annual Global Summit.

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# GENERATIVE AI: THE FUTURE OF CONTENT CREATION?

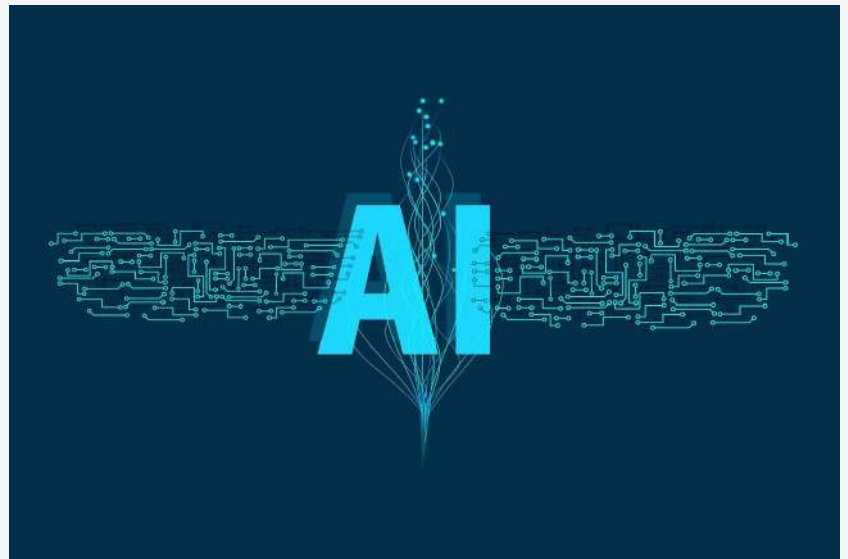
BY ANKITA N ARAVIND, S4 CSE

Generative AI is a rapidly evolving field, and there is growing excitement about the potential of this technology to revolutionize the way we create content. Generative AI can be used to create new forms of art, music, and literature, as well as to generate new products and services.

In 2022, there were some major advancements in generative AI. For example, the Imagen model was able to generate photorealistic images from text descriptions, and the Parti model was able to generate realistic and diverse 3D scenes. These new models have the potential to be used in a wide range of applications, from creating personalized marketing materials to developing new drug treatments.

## WHAT IS GENERATIVE AI?

Generative AI is a type of artificial intelligence that can create new content, such as text, images, videos, music, or code. It does this by learning to identify patterns and relationships in existing content. Once it has learned these patterns, it can use them to create new content that is similar to the content it was trained on. The core idea behind generative AI is to develop algorithms and models that can learn patterns from existing data and generate new content that resembles the original data. This field has seen remarkable progress in recent years, thanks to advancements in deep learning and neural networks.

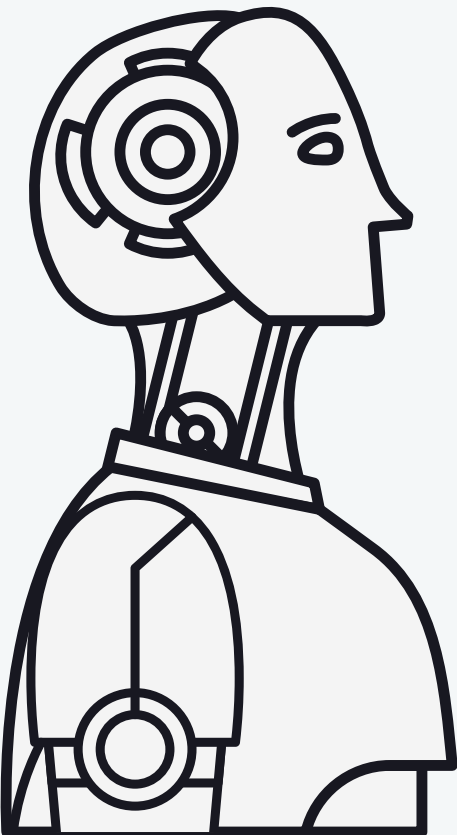


## HOW DOES GENERATIVE AI WORK?

Generative AI works by using a technique called deep learning. Deep learning is a type of machine learning that uses artificial neural networks to learn from data. Neural networks are inspired by the human brain, and they are able to learn complex patterns in data.



## APPLICATIONS OF GENERATIVE AI



There are many potential applications for generative AI. Some of the most promising applications include:

- **Art and entertainment:** Generative AI can be used to create new forms of art, music, and literature. For example, the software program DALL-E 2 can generate realistic images based on text descriptions.
- **Product development:** Generative AI can be used to generate new product ideas, and to improve the design of existing products. For example, the company Autodesk uses generative AI to design new car parts.
- **Marketing:** Generative AI can be used to create personalized marketing messages, and to generate new ad copy. For example, the company Google uses generative AI to create personalized search results.
- **Education:** Generative AI can be used to create personalized learning experiences, and to generate new educational content. For example, the company Duolingo uses generative AI to create personalized language lessons.
- **Research:** Generative AI can be used to generate new hypotheses, and to test existing hypotheses. For example, the company DeepMind uses generative AI to research new drug treatments.

## THE FUTURE OF GENERATIVE AI

The future of generative AI is very bright. As generative AI models continue to develop, we can expect to see even more amazing applications of this technology in the years to come. For example, generative AI could be used to create new forms of art and entertainment that are impossible to create with traditional methods. It could also be used to generate new products and services that are more efficient, effective, and personalized.

Generative AI is a promising new technology with the potential to change the world. However, it is important to use this technology responsibly and to be aware of the potential risks. Overall, generative AI is a powerful tool that has the potential to revolutionize the way we create content. However, it is important to use this technology responsibly and to be aware of the potential risks.

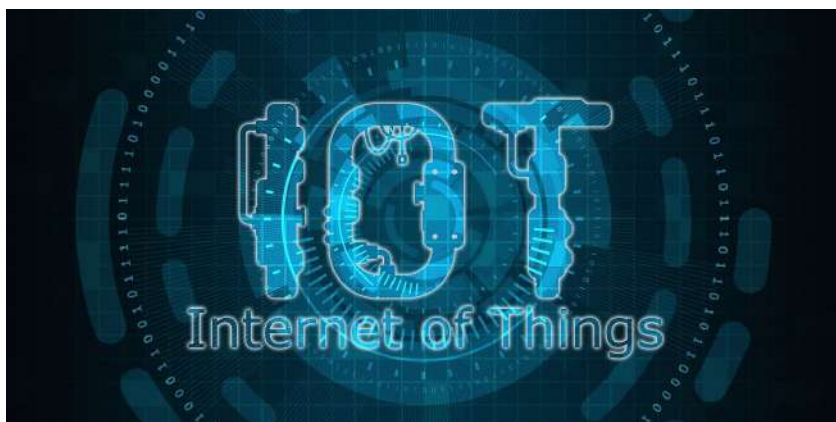


# IOT: EVEN YOUR FRIDGE NEEDS A SOCIAL LIFE

BY FIZZA ANWAR SADATH, S2 CSE

Welcome to the intriguing, utterly bizarre world of the 'Internet of Things' (IoT). You might think you know the internet, but you could be bewildered by the wonders of IoT. In this interconnected realm, the most ordinary household objects come alive with a digital personality and your refrigerator might just be leading a secret social life.

Gone are the days when the internet was confined to our computers and smartphones. With IoT, the web has transcended boundaries and infiltrated every nook of our life turning everyday objects into tech-savvy participants in a never ending digital dance. As much as it sounds fascinating, we also need to uncover some serious aspects concerning it. Questions about privacy, security and the potential consequences of a hyper connected society needs to be addressed.



At the heart of IoT lies the idea of connectivity. By connecting devices to the internet, we enable them to gather, share, and analyze data, making them smarter and more responsive. Everyday objects, from household appliances to industrial machinery, are equipped with sensors and embedded with computing power to capture and process data. This creates a vast network of "smart" devices, all interconnected, working in harmony to make our lives easier and more productive. IoT has rapidly infiltrated our homes and daily routines, transforming the way we interact with technology. Smart homes equipped with IoT devices can control lighting, temperature, security, and entertainment systems through voice commands or smartphone apps. IoT-enabled wearables like fitness trackers monitor our health, while connected kitchen appliances streamline cooking processes. Moreover, autonomous vehicles, made possible through IoT technology, are poised to revolutionize the transportation industry, making travel safer and more efficient.





The impact of IoT extends far beyond our homes, finding extensive applications in industries such as healthcare, agriculture, manufacturing, and logistics. In healthcare, IoT devices facilitate remote patient monitoring, enabling doctors to provide personalized care and improve patient outcomes. In agriculture, IoT-powered sensors can monitor soil conditions, weather patterns, and crop health, optimizing irrigation and fertilization to boost yields sustainably. In manufacturing, IoT implementation has led to the rise of "smart factories" where connected machines and robots coordinate their actions to streamline production processes, reduce downtime, and minimize waste. IoT data analytics also offers valuable insights into supply chain management, allowing businesses to optimize inventory levels, predict demand fluctuations, and enhance overall operational efficiency.

## CHALLENGES AND CONCERNS

While IoT brings numerous benefits, it also presents several challenges and concerns. Security is a significant issue, as the vast number of connected devices provides potential entry points for hackers and cybercriminals. Ensuring robust security protocols and regular updates for these devices is crucial to safeguard against data breaches and privacy violations.

Moreover, as IoT generates enormous amounts of data, concerns about data privacy and ownership have emerged. Companies must establish transparent data policies and comply with regulations to protect consumers' sensitive information and prevent misuse.

Interoperability is another challenge facing the IoT landscape. As the number of IoT devices from different manufacturers increases, ensuring seamless communication between devices and platforms becomes crucial for the technology's widespread adoption.

## FUTURE OF IOT

The future of IoT is undoubtedly promising. As technology continues to advance, IoT applications will become even more diverse and sophisticated. Integration with artificial intelligence (AI) will enable IoT devices to make autonomous decisions, creating a new level of efficiency and convenience.

The development of 5G networks will also play a vital role in the expansion of IoT. Faster and more reliable connectivity will enable real-time data exchange and unlock the full potential of connected devices.

## CONCLUSION

The Internet of Things has transformed our lives and is poised to continue shaping the future of various industries. From smart homes to healthcare and manufacturing, IoT has opened new avenues for innovation and efficiency. While challenges exist, the possibilities presented by IoT are too great to ignore. With responsible implementation, the IoT can pave the way for a more connected and intelligent world.

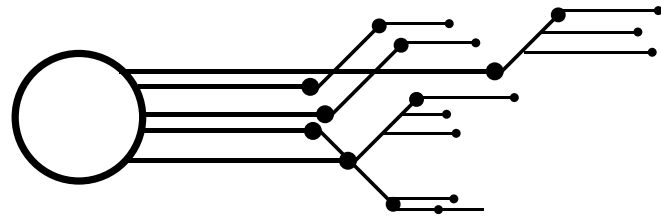
Coming to the privacy and security aspect, interconnected devices increase the potential entry points for cyberattacks which could leave the devices vulnerable to exploitation. IoT devices collect vast amount of data raising privacy risks if breached or misused leading to real world consequences.

With major advancements in technology comes greater responsibility in achieving the safest level of protection possible so that it serves the purpose for the common good.

# ETHEREUM: EMPOWERING THE DECENTRALIZED FUTURE

BY SAMANYU B G, S4 CSE

In the ever-evolving landscape of blockchain technology, Ethereum stands as a revolutionary platform that has captured the world's imagination. Created by Vitalik Buterin in 2015, Ethereum emerged as the first programmable blockchain, introducing a powerful and versatile infrastructure for decentralized applications (dApps) and smart contracts. Ethereum's ability to support smart contracts and dApps has led to its widespread adoption and continuous development. As the leading platform for decentralized applications, Ethereum has fueled the growth of blockchain technology and catalyzed innovative use cases across various industries. Despite facing scalability challenges and competition from other blockchain platforms, Ethereum remains a crucial pillar of the decentralized web, with its vibrant ecosystem and community continuously pushing the boundaries of what's possible in the world of blockchain technology.



## WHAT ACTUALLY IS ETHEREUM?

Ethereum is a decentralized blockchain platform that establishes a peer-to-peer network that securely executes and verifies application code, called smart contracts. Smart contracts allow participants to transact with each other without a trusted central authority. The platform's native cryptocurrency, Ether (ETH), serves as the fuel that powers these transactions and enables developers to deploy smart contracts.

## COMPARISON WITH BITCOIN

But one might ask if Ethereum and Bitcoin's blockchain technology is inherently same, how are they different?

The significant difference is that Bitcoin uses blockchain technology to create a global digital value system. It is specific in its functionality (that of moving money) and doesn't accommodate applications outside of transactions very well. Bitcoin functions more like an app whereas Ethereum functions like an app store. Ethereum creates a global digital cash system that allows developers to experiment with their code and create Decentralized Applications (DApps), or applications that are open-source, decentralized (not controlled by a single entity or authority, but rather by its community), and are cryptographically secure. While Bitcoin is the leading cryptocurrency in terms of performance and market cap today, thanks to the popularity of DApps, many experts in the industry predict that Ethereum may soon outperform Bitcoin.

# WHY ETHEREUM?

At the heart of Ethereum lies its revolutionary feature, smart contracts. These self-executing agreements enable the automation of complex transactions without intermediaries, eliminating the need for traditional legal processes and ensuring transparency and trust within these applications. Apart from that Decentralized Finance (DeFi) has emerged as one of the most prominent use cases on the Ethereum network. DeFi platforms offer decentralized lending, borrowing, yield farming, and trading, enabling users to have greater control over their assets and participate in a borderless financial ecosystem. Moreover, Ethereum has played a pivotal role in the rise of non-fungible tokens (NFTs), transforming digital ownership and creativity. NFTs enable the tokenization of unique digital assets, including art, music, virtual real estate, and more. This has led to a booming digital art market and innovative applications in the gaming and entertainment industries.



# CHALLENGES AND SOLUTIONS



Despite its success, Ethereum is not without its challenges. The network's scalability has been a persistent concern, leading to congestion and high transaction fees during peak times. To address this, Ethereum is transitioning from a Proof-of-Work (PoW) to a Proof-of-Stake (PoS) consensus mechanism through the Ethereum 2.0 upgrade. This upgrade aims to increase the network's capacity, reduce energy consumption, and enhance security.

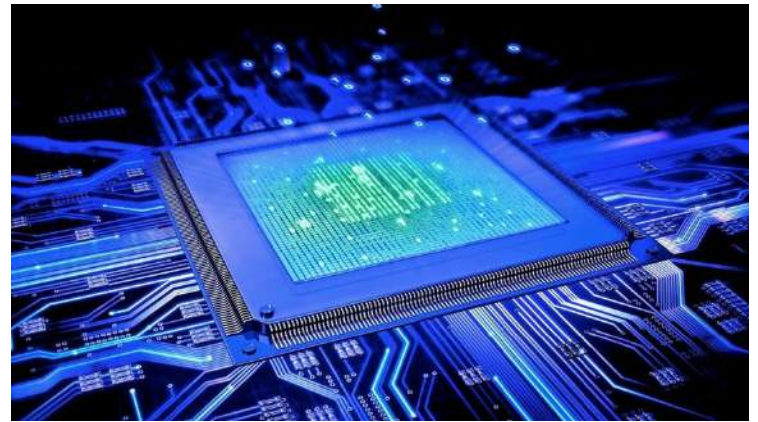
As blockchain technology continues to gain mainstream recognition, Ethereum's role as a pioneer cannot be understated. Its impact on the financial sector, supply chain management, and beyond demonstrates the transformative power of decentralized systems. With the ongoing upgrades and its passionate community, Ethereum seems poised to lead the charge into a decentralized future, where trust, transparency, and ownership prevail. Despite these challenges, the potential benefits of blockchain technology are vast. As the technology evolves, researchers, developers, and stakeholders continue to work towards overcoming these hurdles to unlock the full potential of blockchain in various industries and use cases.



# QUANTUM BITS: UNLEASHING THE POWER OF SUPERPOSITION AND ENTANGLEMENT

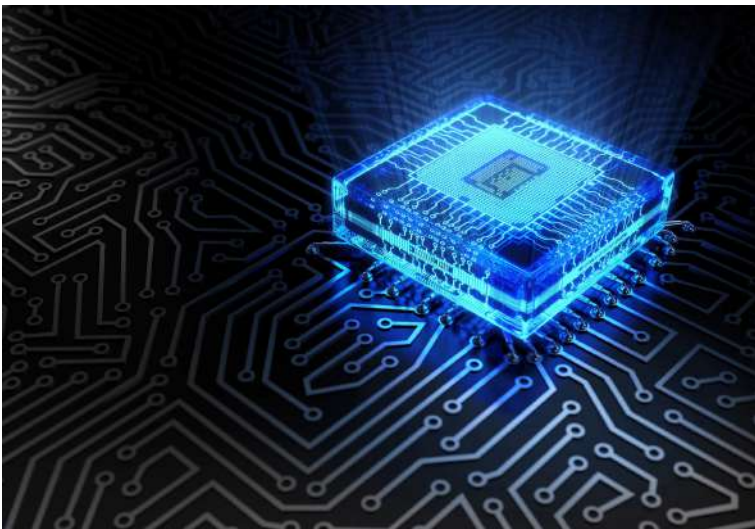
BY ASHNI CHINNU SAM, S4 CSE

In the realm of computing, quantum bits, or qubits, have emerged as the pioneers of a revolutionary technology that promises to redefine our understanding of information processing. Quantum bits harness the peculiar and enigmatic principles of quantum mechanics, allowing them to exist in multiple states simultaneously and perform computations at a staggering pace. As scientists and engineers delve deeper into the realm of quantum computing, the potential applications of qubits extend far beyond our wildest imagination. In this article, we explore the essence of quantum bits, their properties, and the groundbreaking possibilities they bring to the world of technology.



## What are Quantum Bits (Qubits)?

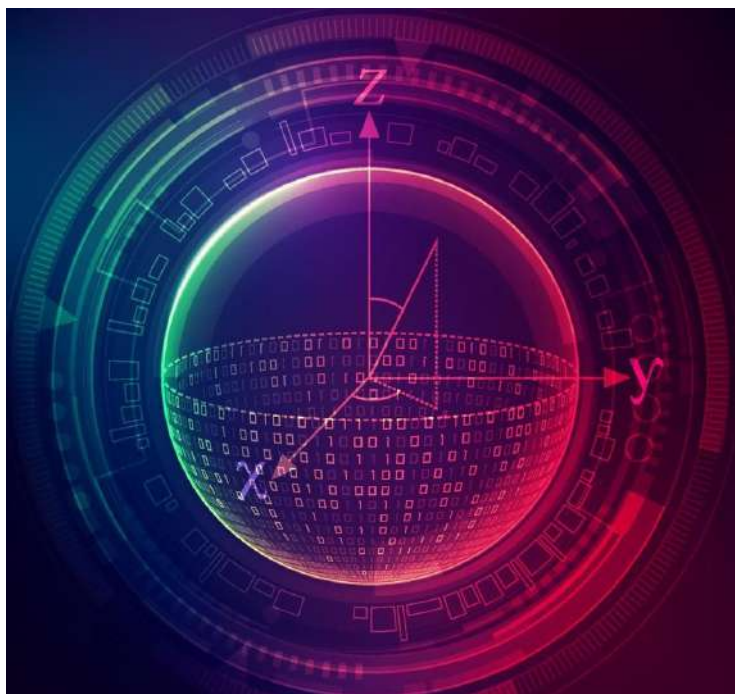
At the heart of quantum computing lies the concept of quantum bits, which differ fundamentally from classical bits. While classical bits represent either a 0 or a 1, qubits can exist in a superposition of both states. This remarkable feature enables qubits to perform multiple calculations simultaneously, exponentially increasing the computing power for certain problems. They are the quantum analogue of classical bits used in traditional computers, which can represent either a 0 or a 1. However, qubits can exist in a superposition of states, meaning they can represent both 0 and 1 simultaneously. This unique property is what gives quantum computers their immense potential for solving certain problems much faster than classical computers.





# Superposition: The Key Quantum Speed

Superposition is the cornerstone of quantum computing. When qubits are placed in superposition, they can embody both 0 and 1 states simultaneously, allowing quantum computers to explore an exponentially larger solution space than classical computers. As a result, certain computational problems, such as factoring large numbers and searching vast databases, become solvable in a fraction of the time it would take classical computers.



## Quantum Hardware Implementations

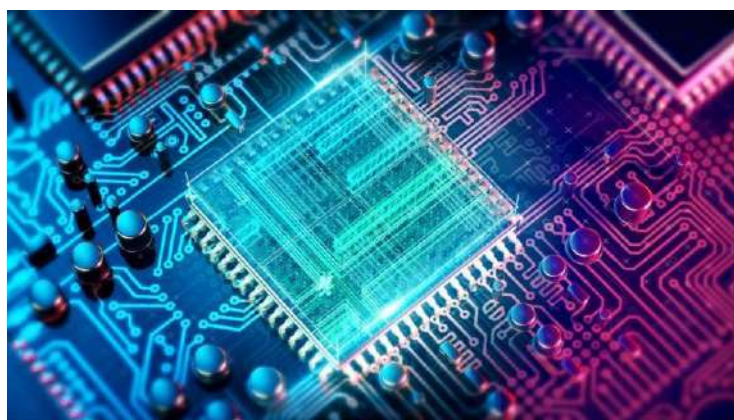
Various physical systems are used to implement qubits, each with its own advantages and drawbacks. Superconducting qubits, trapped ions, topological qubits, and other architectures are at the forefront of quantum hardware research. Companies and research institutions are competing to develop qubits that are robust, scalable, and capable of sustaining quantum coherence for extended periods.

## Quantum Entanglement: Beyond Spooky Action

Entanglement, another bewildering quantum phenomenon, allows qubits to be intrinsically linked, regardless of distance. When qubits become entangled, the state of one qubit instantly influences the state of its entangled counterpart, even if they are light-years apart. This non-locality is a powerful resource for quantum computation and communication, enabling quantum computers to outperform classical systems in specific scenarios.

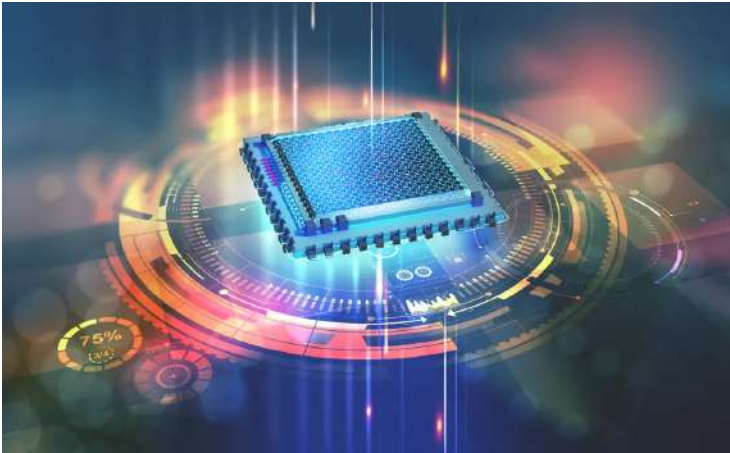
## Challenges and Solutions

While the potential of quantum computing is immense, it faces several significant challenges. Quantum bits are incredibly delicate and susceptible to decoherence, where external factors disrupt their quantum state. Researchers are actively developing quantum error correction codes and fault-tolerant quantum computing techniques to mitigate these issues and enhance qubit stability.



## Beyond the Hype: Real-World Applications

Quantum bits are more than theoretical wonders; they have practical applications that could transform industries. Quantum computing promises to revolutionize fields like cryptography, rendering current encryption methods obsolete and ensuring data security in a post-quantum era. Additionally, quantum algorithms could revolutionize optimization problems, drug discovery, and materials science, opening new avenues for scientific breakthroughs



Quantum bits have taken humanity into a realm where the laws of classical physics no longer hold sway. Their superposition and entanglement properties challenge our intuition, yet they offer unparalleled computing capabilities. As researchers continue to explore the frontiers of quantum computing, we can only begin to imagine the groundbreaking applications and innovations that quantum bits will bring to our world in the coming years.

**Cryptography and Security:** Quantum computers have the potential to break current cryptographic systems, such as RSA and ECC, which rely on the difficulty of factoring large numbers. Quantum algorithms, like Shor's algorithm, can efficiently factorize large numbers, rendering traditional encryption methods vulnerable. Quantum cryptography, on the other hand, offers a more secure way of exchanging cryptographic keys based on the principles of quantum mechanics.

**Drug Discovery and Material Science:** Quantum computers can simulate and analyze complex molecular interactions more efficiently than classical computers. This capability could revolutionize drug discovery by enabling faster and more accurate simulations of drug interactions with target molecules. It could also help design new materials with specific properties, leading to advancements in materials science and nanotechnology.

**Optimization Problems:** Many real-world problems involve finding the best solution among a vast number of possibilities. Quantum computers excel at solving optimization problems, such as supply chain management, financial portfolio optimization, and traffic routing, where the number of potential solutions is exponential in classical computing.

**Machine Learning and Artificial Intelligence:** Quantum computing holds the potential to enhance machine learning algorithms, particularly in cases where the datasets are too large or complex for classical computers to handle efficiently. Quantum machine learning algorithms can lead to more accurate predictions and more sophisticated AI applications.

**Weather Forecasting and Climate Modeling:** Weather forecasting and climate modeling require extensive simulations of complex systems with numerous variables. Quantum computers could offer faster and more accurate simulations, leading to better predictions and improved understanding of climate change.

**Financial Modeling:** Quantum computers could be employed in the financial sector to optimize portfolio management, risk assessment, and derivative pricing. Their ability to handle complex calculations simultaneously could offer significant advantages in this domain.

**Supply Chain and Logistics:** Quantum computing can optimize supply chain and logistics operations by efficiently managing inventory, routing, and distribution, leading to cost savings and improved efficiency.

# THE METAVERSE: BRIDGING REALITIES AND REDEFINING HUMAN INTERACTION

BY ADHARSH M V, S2 CSE

The METAVERSE is a hypothesized iteration of the internet as a single, universal and immersive virtual world that is facilitated by the use of virtual reality (VR) and augmented reality (AR). In the metaverse, users can interact with each other and with digital objects in a way that is more realistic and immersive than is currently possible on the internet. The metaverse is still in its early stages of development, but it has the potential to revolutionize the way we interact with the internet and with each other. It could be used for a variety of purposes, including gaming, education, social networking, and even work. As technology continues to advance, the metaverse holds the potential to reshape various aspects of our lives, providing new opportunities for social interaction, entertainment, work, and education. However, addressing the challenges and concerns associated with its development and implementation will be crucial for its successful integration into our daily experiences.

There are a few key concepts that are important to understand when it comes to the metaverse. These include:

**Spatial computing:** Spatial computing is the ability to interact with digital information in a three-dimensional space. This is made possible by the use of VR and AR technologies.

**Digital humans:** Digital humans are lifelike computer-generated avatars that can be used to represent people in the metaverse.

**Shared experiences:** The metaverse is a shared space where people can interact with each other and with digital objects. This means that everyone in the metaverse will be able to see and interact with the same things.

**Tokenized assets:** Tokenized assets are digital assets that are stored on a blockchain. These assets can be used to represent a variety of things, such as virtual land, clothing, or even skills.







# Potential Applications

The metaverse has the potential to be used for a variety of purposes. Some of the most promising applications include:

**Gaming:** The metaverse could be used to create more immersive and realistic gaming experiences. Players could explore vast virtual worlds, interact with each other in real time, and even compete in live tournaments.

**Education:** The metaverse could be used to create more engaging and interactive learning experiences. Students could explore virtual worlds, interact with digital simulations, and collaborate with other students from around the world.

**Social networking:** The metaverse could be used to create new ways for people to connect with each other. Users could hang out in virtual spaces, attend events, and even go on virtual dates.

**Work:** The metaverse could be used to create new ways for people to work together. Employees could collaborate on projects in real time, attend virtual meetings, and even train new employees in a virtual environment. These are just a few of the potential applications of the metaverse. As the technology continues to develop, we can expect to see even more innovative and groundbreaking uses for this exciting new platform. The metaverse is a rapidly evolving technology with the potential to revolutionize the way we interact with the internet and with each other. It is still in its early stages of development, but it has the potential to change the world in a profound way. We are only just beginning to explore the possibilities of the metaverse, and it will be interesting to see how it develops in the years to come. In the coming years, the metaverse will undoubtedly remain a topic of intense exploration, discussion, and experimentation. As we venture further into this virtual frontier, let us embrace its potential with cautious optimism, ensuring that this remarkable technology serves as a force for positive change, empowering individuals and communities, and bringing us closer together in the global digital tapestry of the metaverse.



# Challenges and concerns

While the metaverse holds great promise, it also raises several challenges:

1. **Privacy and Security:** As digital lives become more intertwined with physical lives, ensuring data privacy and security becomes critical.
2. **Access and Inclusivity:** Building an equitable metaverse requires addressing access barriers, such as the cost of hardware and internet connectivity, to ensure inclusivity for all.
3. **Ethical Considerations:** With the potential to influence real-world behavior, the metaverse raises ethical questions about content moderation, community guidelines, and the impact on mental health.
4. **Content Moderation:** Moderating user-generated content to prevent inappropriate or harmful behavior poses a challenge in open virtual environments.
5. **Legal and Regulatory Considerations:** The metaverse raises various legal and regulatory questions related to intellectual property rights, digital asset ownership, and cross-border interactions.



In recent years, the term "metaverse" has gained traction in the tech and gaming world, captivating the imagination of millions worldwide. Often described as a convergence of the physical and virtual realms, the metaverse represents an interconnected network of immersive virtual spaces, communities, and experiences. Think of it as a collective virtual universe that users can explore, interact with others, and build upon. The metaverse represents a groundbreaking step in the evolution of human interaction and digital experiences. As technology advances and the concept matures, it will reshape how we socialize, work, learn, and entertain ourselves. However, its success hinges on addressing the challenges it presents and ensuring that it remains a force for positive change and enrichment in our lives. In conclusion, the metaverse represents a tantalizing vision of the future—a virtual, interconnected world where our physical and digital lives converge. As technology advances, the metaverse has the potential to transform the way we live, work, socialize, and entertain ourselves. It offers a range of exciting possibilities, from immersive gaming experiences and virtual concerts to revolutionary remote work environments and innovative educational platforms.

# Memories

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# Memories

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# FROM THE EDITOR'S DESK

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We have the newest issue of "Threads" at last. Yes, the journey was successful! Our faculties came up with the idea to release the updated version of Threads when the magazine's release was abruptly stopped. Giving the outdated Threads a second chance wasn't that easy. But with amazing teamwork, we were successful.

The journey in the making of this magazine was pleasant and thrilling with our enthusiastic editorial team, working relentlessly in their attempt to compile a masterpiece. Our endeavour has been to accomplish a benchmark by getting original articles, and the chain of events happened with the support of our dear faculties. The experience was extremely humble.

Connecting with the students who can truly contribute to this magazine was also quite thrilling. For the sake that we needed "Threads" with all its good essence. I'm astonished by all the little things they've accomplished, though, after giving them all the directions I've been given. Not just our students, but also our former pupils. How gleefully they greeted us and contributed. I therefore thank our entire department for reposing their faith in us and extending their wholehearted contribution in every possible way.

Now that you can all read and understand Threads, start preparing your own articles for the upcoming editions. I'm expecting that this will be distributed throughout all upcoming batches and that all editions will be released continuously.

Signing off,  
Carolene Joy



# CONTENT TEAM

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**ASHNI CHINNU SAM**  
S4 CSE



**ANKITA N ARAVIND**  
S4 CSE



**SAMANYU B G**  
S4 CSE



**FIZZA ANWAR SADATH**  
S2 CSE



**ADHARSH M V**  
S2 CSE

# DESIGN TEAM

---



**ASHNI CHINNU SAM**  
S4 CSE



**JEFFREY SHIHO**  
S4 CSE