NANDHA ENGINEERING COLLEGE

AFFILIATED TO ANNA UNIVERSITY, CHENNAI.
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DEPARTMENT OF
ELECTRONICS AND COMMUNICATION ENGINEERING
(e-ZEALOTS)

TECHNICAL MAGAZINE '24

ISSUE NO : 02

NANDHA ENGINEERING COLLEGE
(AUTONOMOUS)

VISION

To be an Institute of excellence providing quality Engineering, Technology and Management education to meet the ever changing needs of the society.

MISSION

- To provide quality education to produce ethical and competent professionals with social responsibility.

- To excel in the thrust areas of Engineering, Technology and Entrepreneurship by solving real- world challenges.

- To create a learner centric environment and improve continually to meet the changing global needs.

DEPARTMENT OF
ELECTRONICS AND COMMUNICATION ENGINEERING

VISION

To foster academic excellence imparting knowledge in Electronics, Communication and allied disciplines to meet the ever growing needs of the society.

MISSION

- To impart quality education and develop an aptitude for professional career and continuous learning with ethics and social responsibility.

- To provide a framework for research and innovation to meet the emerging problems through regular interaction with industry.

- To be a learner centric environment by upgrading knowledge and skills to cater the needs and challenges of the society

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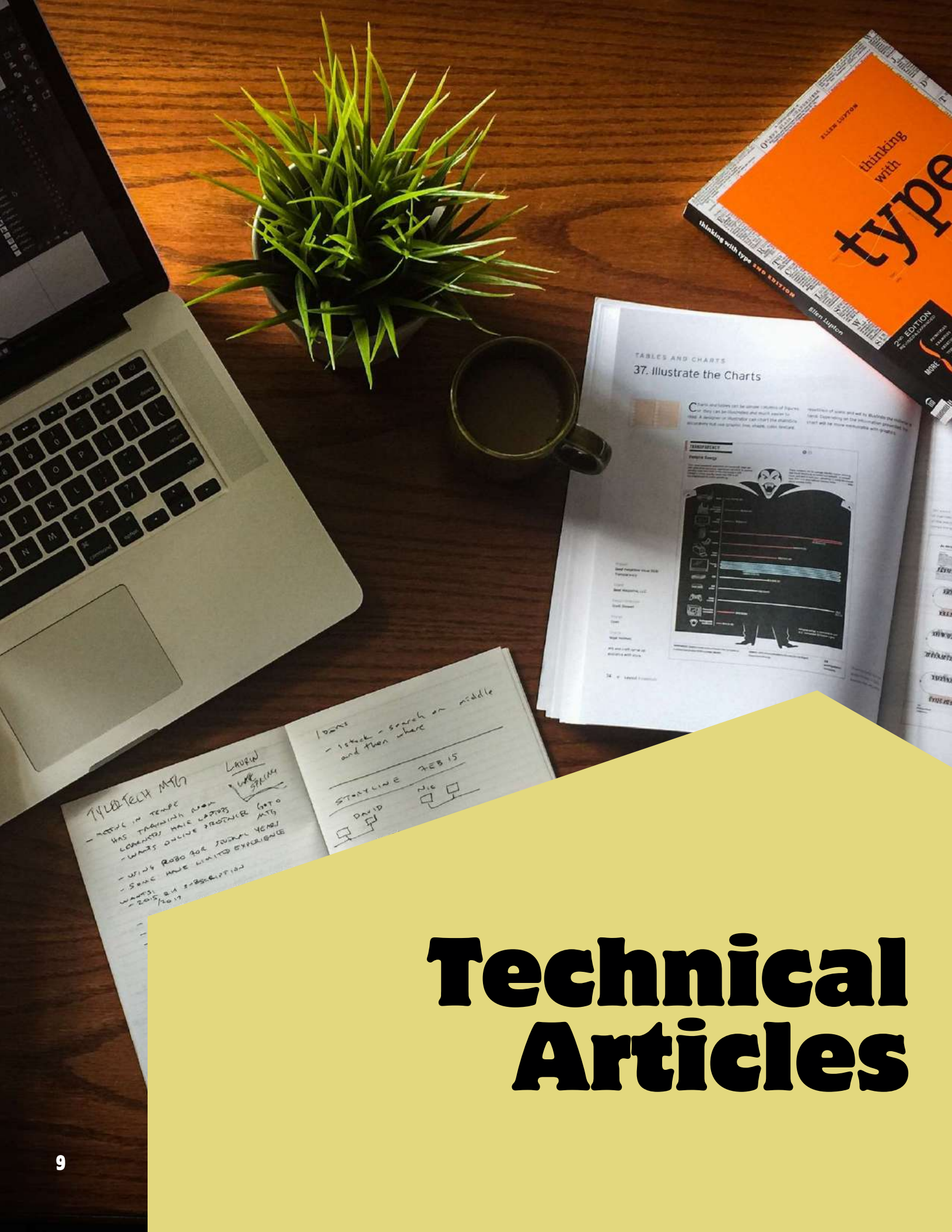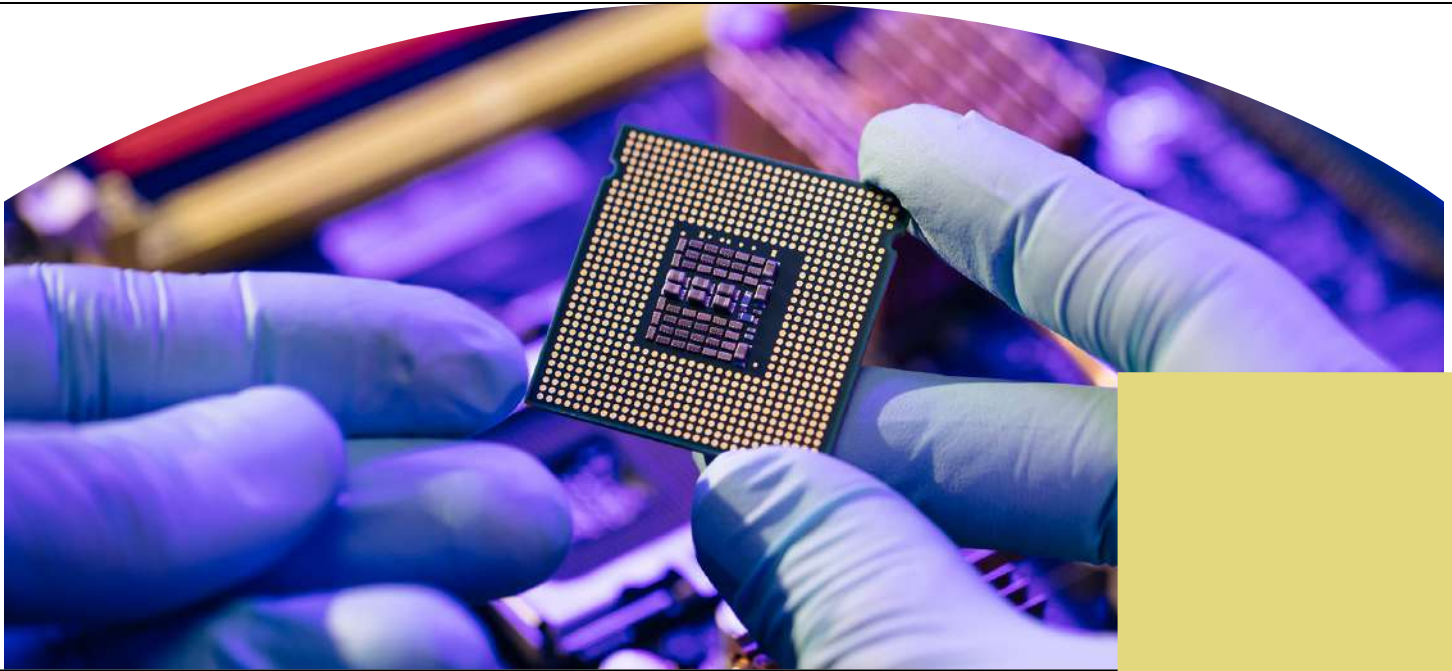I YEAR

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Technical Articles

Unveiling the Future: The Evolution of Semiconductor Technology

By
DINESH S
I YEAR

The future of semiconductors holds the key to unprecedented innovations. As we navigate the intricate landscape of electronic components, the trajectory of semiconductors charts a course toward efficiency, speed, and miniaturization.

1. Quantum Leap in Processing Power:

Semiconductor technology is on the brink of a paradigm shift with the integration of quantum computing. As traditional silicon-based chips approach their physical limits. quantum processors promise exponential leaps in processing power. Quantum bits, or qubits can exist in multiple states simultaneously, revolutionizing the capacity to solve complex problems can exist in multiple states simultaneously, revolutionizing the capacity to solve complex problems.

2. Rise of Neuromorphic Computing:

Inspired by the human brain, neuromorphic computing is a groundbreaking approach to semiconductor design. Mimicking the brain's neural architecture, these chips can perform tasks like pattern recognition and machine learning with unparalleled efficiency. The future holds the promise of more intelligent, energy-efficient devices powered by neuromorphic processors.

3. Beyond Moore's Law:

   The semiconductor industry has long adhered to Moore's Law, which posits that the number of transistors on a chip doubles approximately every two years. However, as the physical limitations of miniaturization become apparent, the industry is exploring alternative materials and innovative architectures. The era beyond Moore's Law heralds novel approaches, including 3D stacking and advanced materials like gallium nitride and silicon carbide.
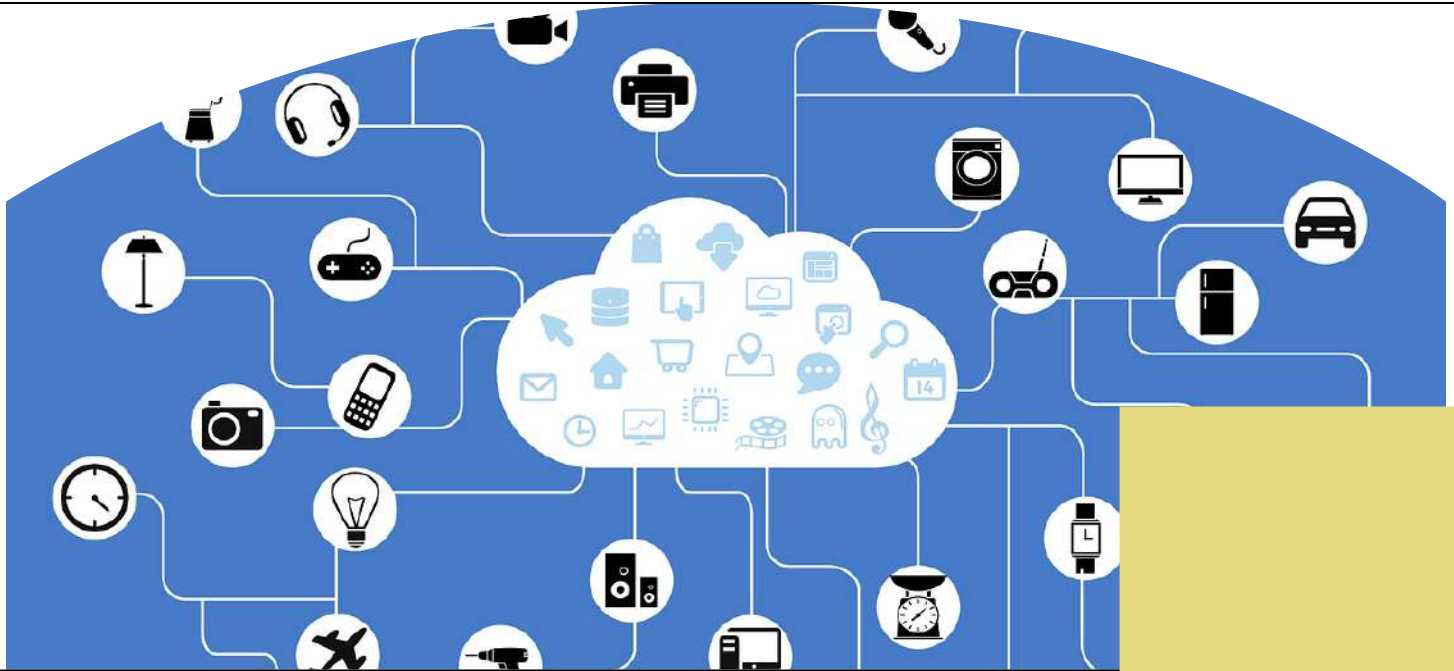
4. Internet of Things (IoT):

   Semiconductors form the backbone of the Internet of Things, connecting everyday devices to create a seamlessly integrated world. Future advancements in semiconductor technology will facilitate the proliferation of lot. enabling smart cities, autonomous vehicles, and interconnected ecosystems that redefine the way we live and interact.

**5. Environmental Considerations:**

   As the world grapples with environmental challenges, the semiconductor industry is actively pursuing sustainable practices. From the development of energy-efficient chips to eco-friendly manufacturing processes, the future of semiconductors includes a commitment to reducing the environmental impact of technology.

   In conclusion, the future of semiconductor technology is a tapestry woven with quantum leaps, neuromorphic marvels, and sustainable innovations. As we stand at the cusp of a new era, the evolution of semiconductors promises a world where the boundaries of possibility are continually pushed, giving rise to a future shaped by the relentless pursuit technology.

Machine Learning
&
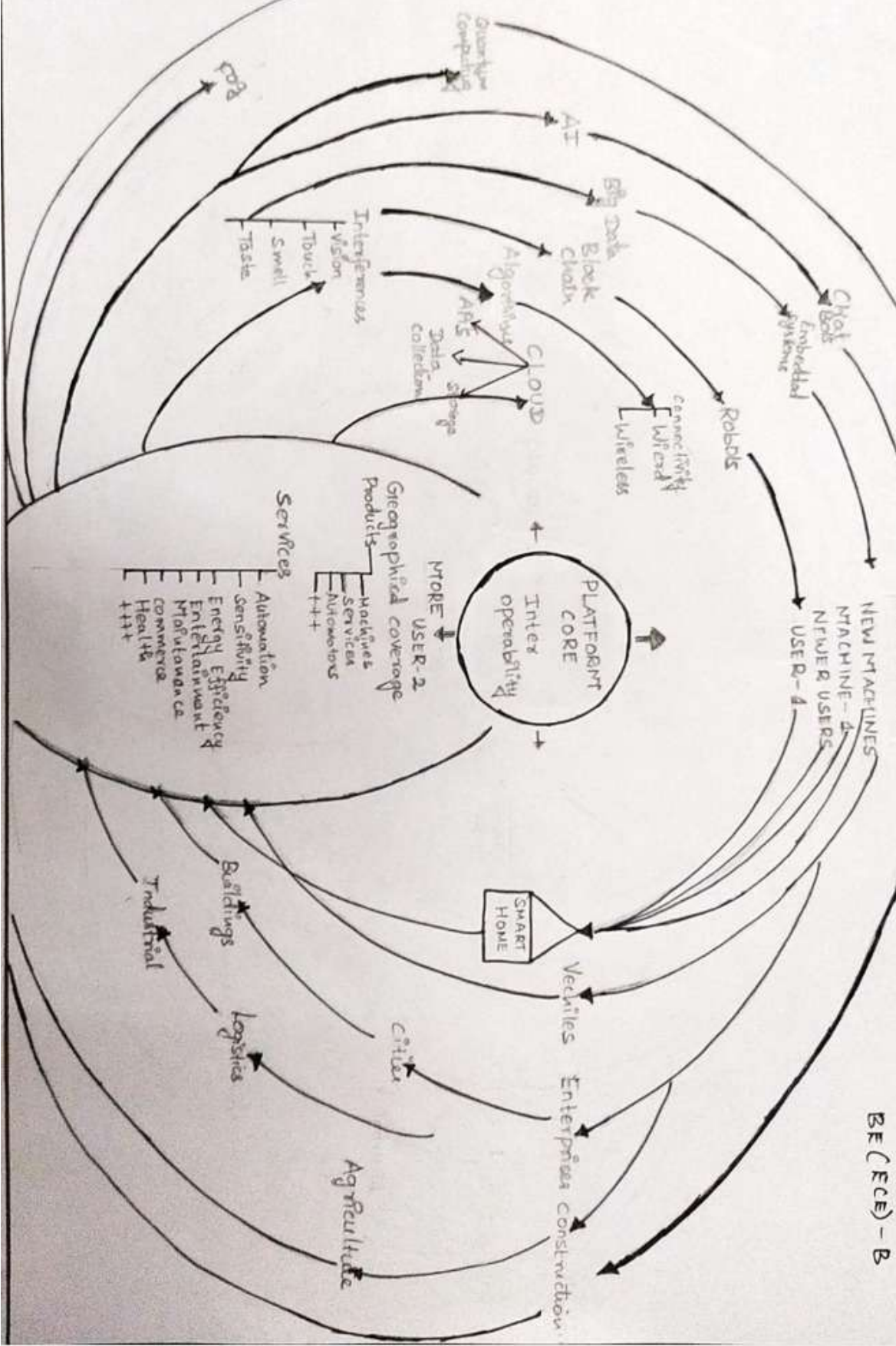# Internet of Things

By
NAVINA K S
I YEAR
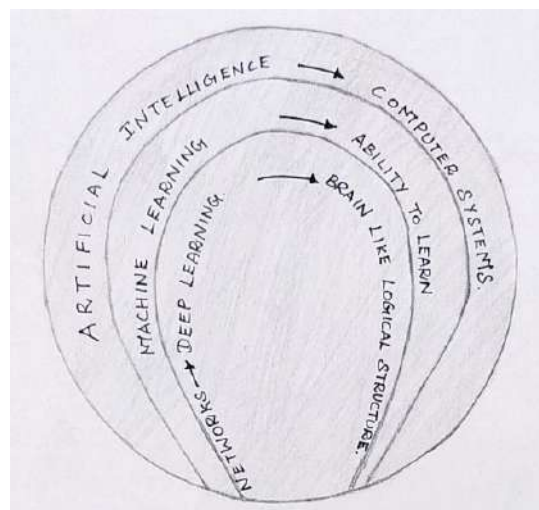
      Machine learning is a dynamic field at intersection of Computer Science and statistics, empowering computers to learn patterns from data and wake intelligent decision without explicit programming. It is used in diverse area like image recognition and predictive analytics, promising transformative impacts on industries and automation.

      Machine learning is a branch of artificial intelligence that focuses on developing algorithms and models, allowing computer to learn patterns from data.
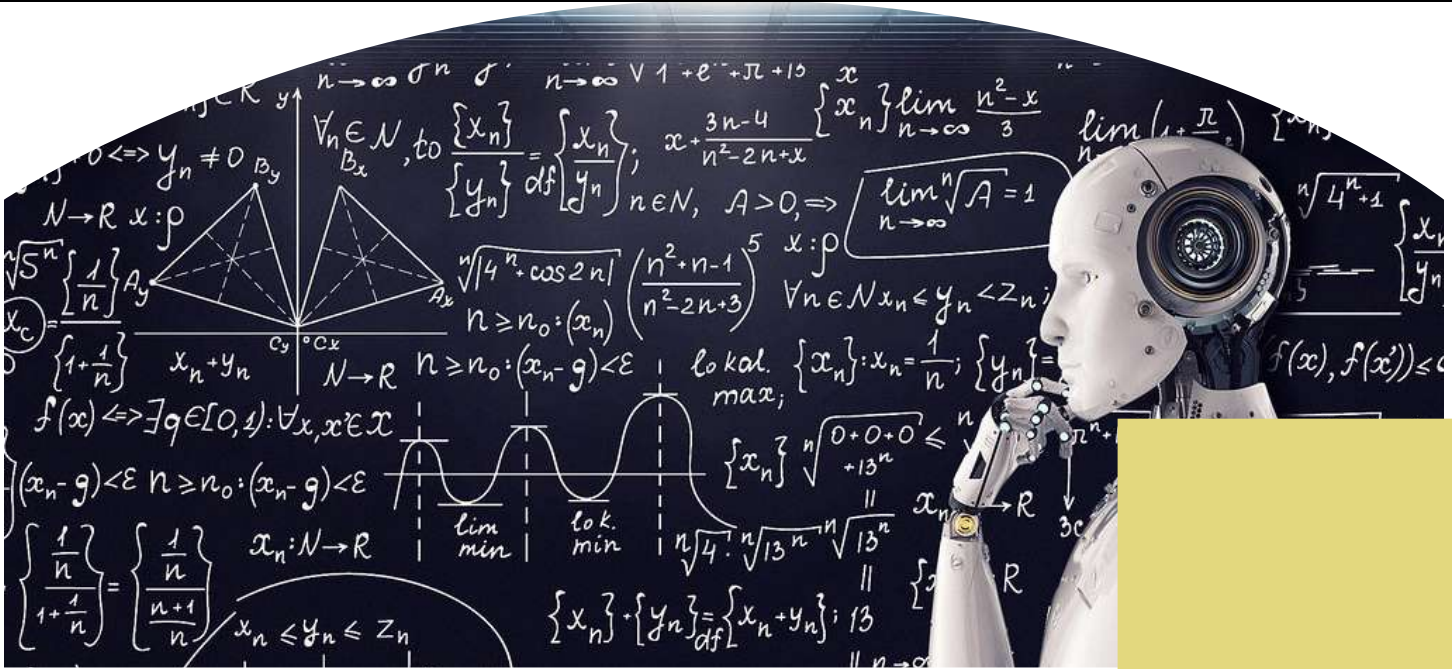
INTERNET OF THINGS

MORE DEMAND

PREPARED BY
K.S. NAVINA (1st yr)
BE (ECE) - B

PLATFORM CORE
Inter operability

MORE USER-2

SMART HOME

NEW MACHINES
MACHINE - 4
NEWER USERS
USER - 4

Quantum computing
Fog
AI
Big Data
Block chain
Chat Bots
Embedded systems
Robots
connectivity
Wired
Wireless
Cloud
Algorithms
AIS
Data storage
Data collection
Interference
Vision
Touch
Smell
Taste

Services
Products
Geographical coverage
Machines
Services
Automators
+++
Automation
Sensitivity
Energy Efficiency
Entertainment
Maintenance
Health
commerce
+++

Vehicles
Cities
Buildings
Logistics
Industrial
Enterprise construction
Agriculture

Machine Learning In Robotics

By
DEVADHARSHINI K
II YEAR

Abstract:

Robots have perpetually captivated us with remarkable autonomy in, task execution. the progression of technology, the machine learning CNL) and Robotics realm of uncharted possibilities. the Through convergence of has unleashed N2 algorithms equip robots with the ability to acquire knowledge through experience, swiftly adopt to evolving environments, and make astute Judgements. Here, realm we will delve into the enthralling of Machine Learning in robotics, encompassing. Its applications, advantages, hurdles and the promising prospects It holds for the future.

Introduction:

The Machine learning is Instrumental in the capabilities of Robots. Through the utilization of NTL algorithms, robots can effectively handle extensive data; comprehend their surroundings, and acquire knowledge from interactions, thereby enhancing their performance. This empowers robots to execute Intricate tasks, manoeuvre through dynamic environments and collaborate seamlessly with humans.

Benefits of machine learning in Robotics : The Integration of machine learning (ML) into brings in the capabilities and in Various range of benefits, enhancing performance of robots styles, some key benefits of using ML robotics are,

Adaptability : ML enables robots to adapt to changing environments and handle unforeseen circumstances. They can learn from experience, detect patterns, and performance make adjustments to optimize

Efficiency: ML algorithms empower robots to acquire efficient, strategies for task execution, enabling them to wastage, optimize energy utilization, reduce and enhance overall operational efficiency.

Safety : ML enhances robot them to detect and avoid potential risks, and to ensure Itself. the Safety by enabling Obstacles, predict make real time decisions safety of humans and the robot

precision: ML algorithms enable robots to perform tasks with high precession and accuracy. They can learn from data, improve their motion Skills and execute delicate operations.

Challenges of Machine learning in Robotics :

The Integration of Machine Learning (ML) into brings a range of benefits, enhancing performance of robots , robotics the capabilities and various ways. Some key benefits of using ML in Robotics are,

Data Limitations : ML algorithms require large amounts acquiring watery data to learn effectively. of high-quality and Labelling such data for robotic applications can be challenging and time-consuming.

Generalization : ML models trained in specific environment may struggle to generalize to new situations. Robots need to learn from diverse datasets and adapt to various scenarios to ensure robust performance.

Real time Decision-Making: Robots often operate in dynamic environments where real-time decision making is crucial. ML algorithms need to be efficient and capable of making quick decision safe and effective robot behaviour to ensure.

Applications of Machine learning in Robotics:

The application of machine learning in robotics has revolutionized the capabilities and functionalities of robots across various domains. Some notable applications in robotics includes are ,

Industrial Automation : ML enabled robots are revolutionizing the manufacturing industry. They can optimize production processes tasks with person and adopt to Production line. ML to detect anomalies. algorithms perform repetitive various operations in enable robots , predict maintenance needs, and enhance overall productivity.

Healthcare robotics: ML is transforming the health care sector by enabling robots to assist in surgeries Support Robots track patient vitals and deliver can analyze medical and assist doctors in making informed decisions. ML algorithm enables robots to learn from patient data improve diagnostic accuracy and optimize treatment Plans.

Service robotics : ML service robots is driving advancements in that in various tasks, such as household chores, eldercare, and customer service. These robots can understand natural language recognize Objects and faces, and adopt to preferences.

The Future of machine learning in robotics:

The incorporation of ML in Robotics presents vast possibilities. With the progression of technology robots will evolve into more intelligent entities adapt at learning from limited data and adjusting to novel circumstances. The realization of collaborative robotics where humans and robots seamlessly collaborative will become flexible . ML will empower robots to comprehend human intentions, anticipate requirements and offer customized assistance .

Conclusion:

In conclusion, Machine learning is transforming robotics and opening up new frontiers in automation. ML algorithms enable robots to learn adapt and perform complex tasks with precession. The application of ML in robots span various industries form manufacturing to healthcare and autonomous vehicles. While challenges exist , continued research and development will overcome these hurdles and the way for a future where intelligent robots work alongside humans, improving efficiency safe and overall quality of life .

WIRELESS SENSING NETWORK

By
DIVYADHARSHINI V
I YEAR

ABSTRACT :

A wireless sensing network is basically an IOT , a wireless sensor in a network is like a special messenger that can send and receive messages without using wires . It's like a tiny computer , let's see about the topologies and applications of a particular wireless sensing network like pacemaker.

TOPOLOGIES OF WSN :

Wireless sensor network can have different network topologies based on how the sensors are organized and connected . Here are some common topologies

- Star topology
- Tree topology
- Cluster topology
- Mesh topology
- Hybrid topology
- Ad Hoc topology

- All sensor talk to a central hub and the hub manages and process all the information.

- Sensors can talk to nearby Sensors forming a network like friends chatting group if one friend has new they tell the others and the news is spreads.

- sensors are organized like a family tree. Information starts at the one point and branches out, kind of like how a family tree has a central ancestor and then different generations.

- It's like mixing and matching .You can use different ways of connecting sensors based on what works best for the situation.

- Imagine a school where each class has a class representative , the class representative gather every information and then share it to the principal.

- this is like a bunch of friends talking in a circle. They can all speak to each other directly without needing a leader , but they still get the message across .

PACEMAKER

A pacemaker is considered as a part of Internet of Things in the sense that it is a connected medical device that communication and shares data wirelessly , often with a centralized system or a healthcare provide . It can be a wireless communication and can be remote monitored that enhances patient care that is integrated with healthcare system.
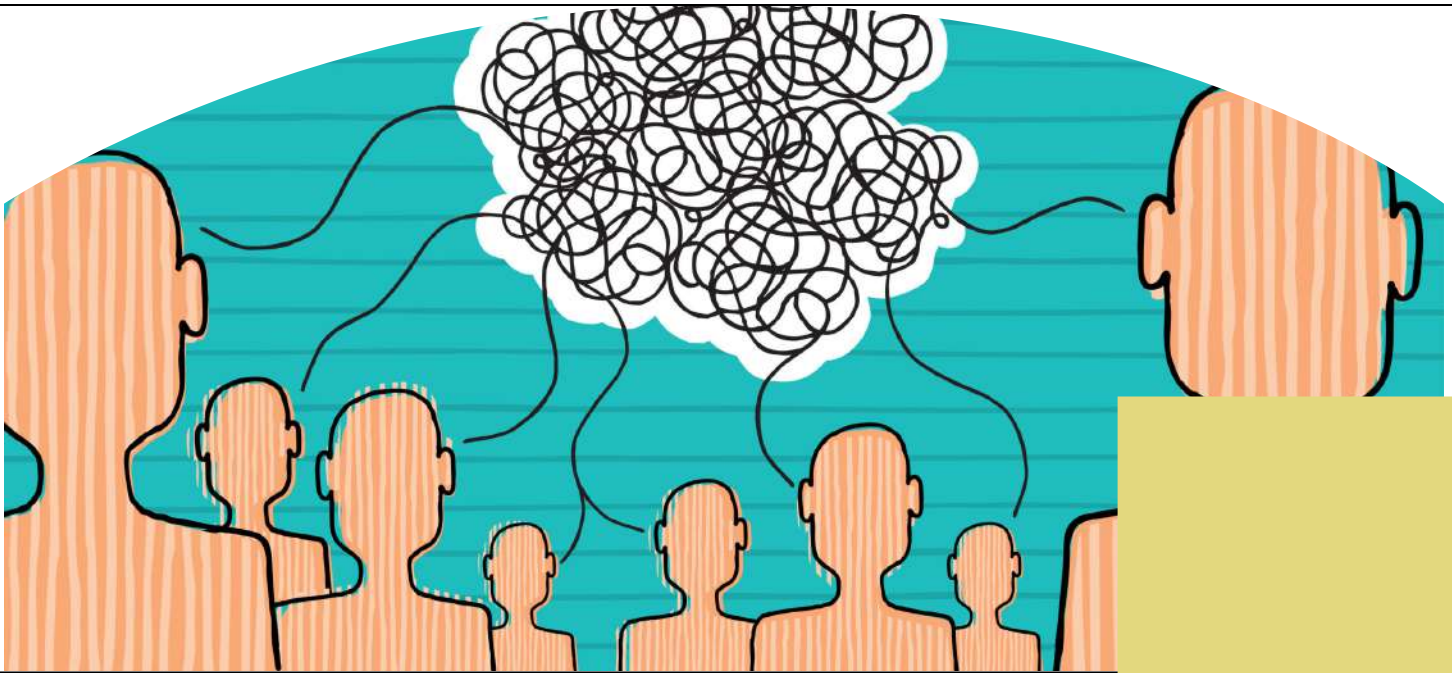
COMMUNICATION AND LEARNING

By
SOWBARNICA A V
I YEAR
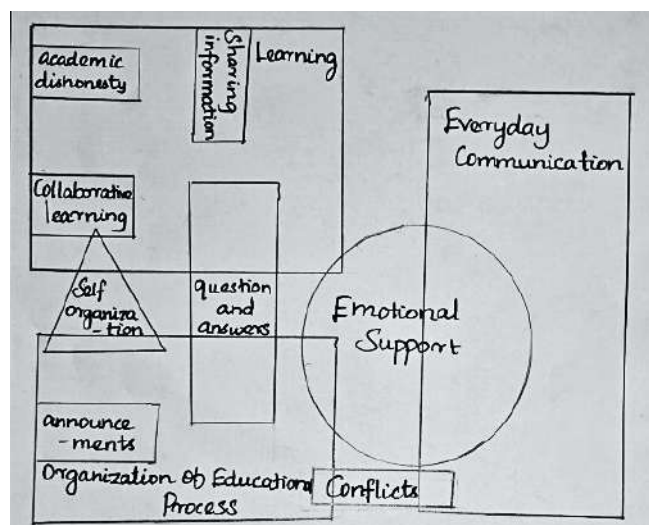
Communication and learning are intricately connected aspects of human interaction-effective Communication Serves as the foundation for acquiring knowledge and Skills Through Verbal and nonverbal exchanges, individuals Share ideas Convey information and engage in Collaborative learning experience. The process of learning in turn refines Communication Skill by expanding Vocabulary, fostering Critical thinking, and enhancing the ability to articulate throughts Coherently whether in traditional classroom Or virtual environments, Communication remains the Conduit through which knowledge is transmitted and understanding is Cultivated.

5G - WIRELESS COMMUNICATION

By
DURGA S
I YEAR

ABSTRACT :

5G Technology stands for 5th generation mobile technology 5G denote the next major phase of mobile telecommunication standards beyond the upcoming 4G standards 5G technology will change the way most high bandwidth.

INTRODUCTION :

5G Technology aims to connect devices , machines and people who uses them through high speed and low latency data connection company : T mobile VS
Faster data speeds and higher bandwidth.

RESULT OF 5G TECHNOLOGY :

Significantly faster than 4G , delivering up-to 20 Gigabyte per second peak data rates and 100+ megabits per second (Mbps) average data rates. It provide seamless coverage in remote areas across the country.

5G size CAGR of 76.29:
- High resolution for crazy cell phone and more attractive 25 maps connectivity speed .
- Better & faster solution and more effective.
- Uploading & downloading speed of 5G touching the peak.

VIRTUAL REALITY

By
DHANALAKSHMI M
I YEAR

ABSTRACT:

Virtual Reality (VR) is a computer generated environment with scenes and objects that appear to be real, making the user feel they are immersed in their surroundings. Many people are still unfamiliar with the concept of VR.

INTRODUCTION:

This environment is perceived through a device known as a virtual reality headset or helmet. VR allows us to immerse ourselves in video games as If we were one of the characters, learn how to perform heart surgery. The invention dates back as far as the mid 1950s.

INNOVATIVE USES FOR VR:

The Spanish National Research council has succeeded of reducing the effects of Parkinson's in several patients by applying a treatment that uses VR. Users can enter a scene in a video game or Practice extreme sports without moving from their Sofa.

FUTURE OF VIRTUAL REALITY:

The big technology companies are already working to develop headsets that do not need cables and that allow Images to be seen in HD. VR headsets in 8k and with Much more powerful processors. The latest 15 standard can also provide Very interesting scenarios for the evolution of virtual environment.

VR TECHNOLOGY WORK:

The VR process combines hardware and Software to create immersive experiences that "fool" the eye and brain. Hardware supports sensory stimulation & simulation Buch as Bounds, Touch, Smell or heat intensity while software creates the rendered virtual environment.

CONCLUSION:

All this means that VR is no longer science fiction. It is integrated into our present &, in the coming years, it will lead to advances that will shape the future.

QUANTUM COMPUTING

By
ARAVIND M
III YEAR

WHAT IS QUANTUM COMPUTING?

Quantum computing refers to a computational technology that uses the principles of quantum mechanics such as entanglement, superposition, and interference to process, store and manipulate large amounts of data and perform complex calculations for conventional computing systems and supercomputers to fathom.

Now that the uncertainty phenomenon was visible, technologists needed a tool to undertake calculations while managing the uncertainty. Thus, 'quantum computing was born. It is based on physical laws that govern the subatomic world, where elementary particles can simultaneously be in several states and places. The technology observes the behavioral pattern of matter and energy at the quantum level and exploits it in a quantum computing model.

HOW DOES QUANTUM COMPUTING WORK?

Quantum computing operates on the principles of quantum mechanics, utilizing quantum bits or qubits to process information. Unlike classical bits, which can exist in a state of either 0 or 1, qubits can exist in a superposition of both 0 and 1 simultaneously. This unique property exponentially increases the computational capacity of quantum. computers.

KEY PRINCIPLES:

Superposition:

Qubits can exist in multiple states at once. This allows quantum computers to perform many calculations simultaneously, offering a parallelism not achievable with classical bits.

Entanglement:

When qubits become entangled, the state of one qubit is directly linked to the state of another, regardless of the distance between them. This phenomenon enables the creation of quantum gates that operate collectively, enhancing computational efficiency.

Quantum Gates:

Similar to classical logic gates, quantum gates perform operations on qubits. Quantum gates take advantage of superposition and entanglement to perform complex computations more efficiently than classical counterparts.

Quantum Measurement:

When a quantum system is measured, it collapses from a superposition of states to a specific state. This process is probabilistic, introducing an element of quantum computing.
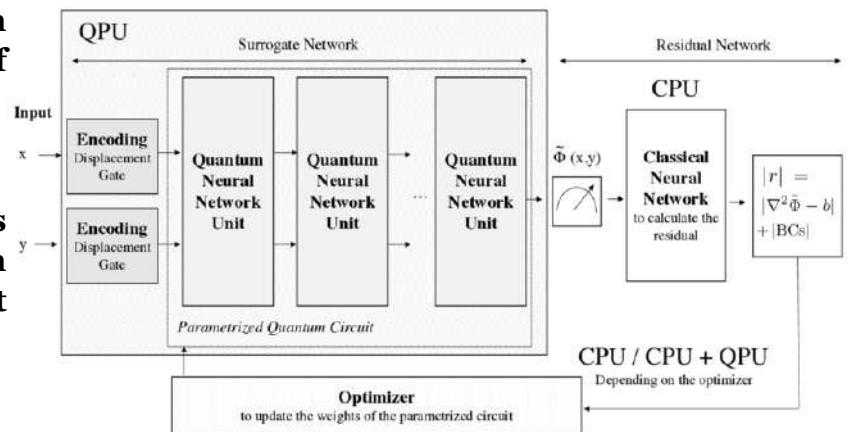
QUANTUM COMPUTING PROCESS:

Initialization:
Qubits are prepared in a known state, often initialized to a state of superposition.

Gate Operations:
Quantum gates perform operations on qubits, leveraging superposition and entanglement to carry out parallel computations.

Entanglement:
Qubits become entangled, allowing for collective operations that exploit the interconnectedness of quantum states.

Measurement:
The quantum system is measured, collapsing the superposition of states into a specific outcome.

Result:
The measured outcome provides the result of the computation, which may involve multiple possibilities due to the probabilistic nature of quantum measurement.

APPLICATIONS ACROSS INDUSTRIES

The potential applications of quantum computing span various industries. In finance, quantum algorithms could optimize portfolio management and solve complex risk assessments. Drug discovery and material science may benefit from. simulating molecular structures with unprecedented accuracy. Additionally, machine learning models stand to gain from quantum computing's ability to process vast datasets more efficiently

CHALLENGES:

Decoherence:
Quantum systems are sensitive to external factors, leading to decoherence-loss of quantum information. Maintaining qubit stability is a critical challenge.

Error Correction:
Quantum computers are susceptible to errors caused by environmental factors. Developing effective error- correction methods is crucial for the reliability of quantum computations.

Scalability:
The Building large-scale, fault-tolerant quantum computers is a significant challenge. Researchers are exploring various qubit implementations to address scalability issues.

In conclusion, the quantum computing represents a paradigm shift with the potential to reshape the technological landscape. As researchers continue to unravel the mysteries of quantum mechanics, the journey towards practical and impactful quantum. computing applications is poised to redefine the boundaries of what is computationally possible. The interplay between theory and experimentation will undoubtedly pave the way for a future where quantum computers unlock solutions. to some of humanity's most complex problems.

Things   Communication Networks
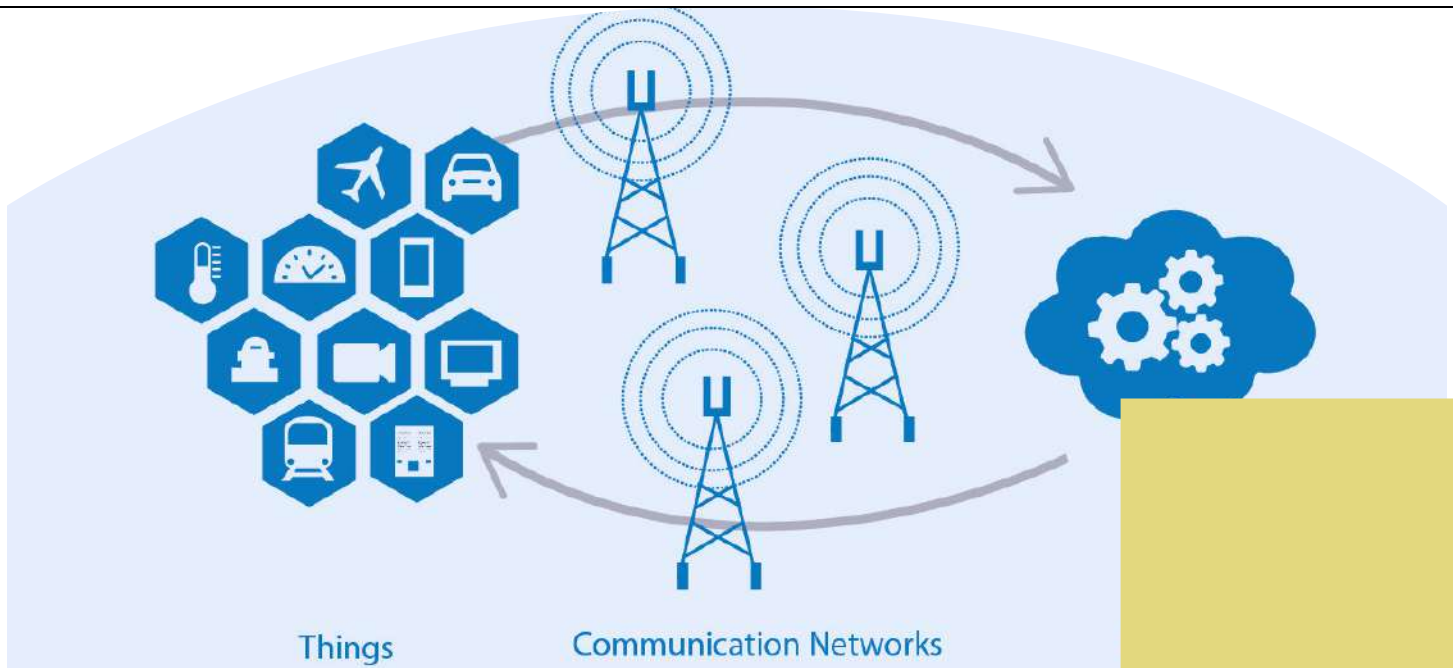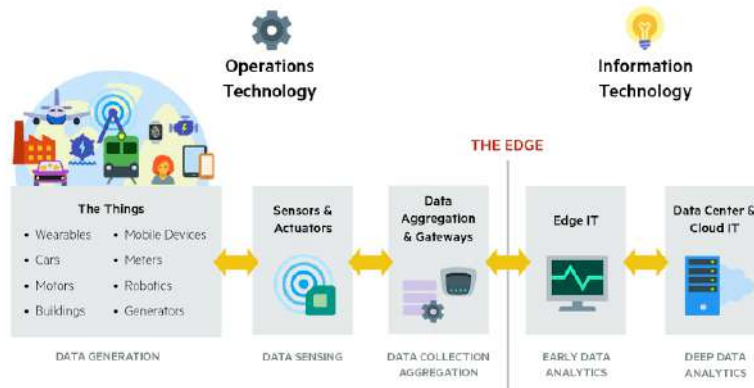
EDGE COMPUTING

By
AFSAR FARUK J
III YEAR

What is EDGE Computing?

Edge computing is a distributed computing framework that brings enterprise applications closer to data sources such as loT devices or local servers. This proximity to data at its source can deliver strong business benefits, including faster insights, improved response times and better bandwidth availability.

Why EDGE Computing?

Indeed, the adoption of edge computing represents a transformative shift in the way businesses leverage technology. Here are some key aspects that make edge computing exciting for businesses across various industries.

1. Fast and Instant Decisions : Edge computing makes computers work really fast, making quick decisions without needing to connect to faraway networks. This is super important in places like hospitals and factories.

Operations Technology | **Information Technology**

THE EDGE

The Things
- Wearables
- Cars
- Motors
- Buildings
- Mobile Devices
- Meters
- Robotics
- Generators

Sensors & Actuators | Data Aggregation & Gateways | Edge IT | Data Center & Cloud IT

DATA GENERATION | DATA SENSING | DATA COLLECTION AGGREGATION | EARLY DATA ANALYTICS | DEEP DATA ANALYTICS

2. Always Reliable: It helps important systems keep running even if the internet is down, ensuring things work all the time, especially in critical places like hospitals or financial institutions.

3. Keep Secrets Safe: Edge computing keeps private information safe by handling it locally, reducing the chances of it being hacked or misused.

4. Reacting Quickly: Businesses can respond quickly to changes because edge computing processes information right away, making things happen in real-time.

5. Better Shopping and Services: In stores, it brings cool digital stuff to make shopping better, like personalized ads and faster checkout. It's like bringing the online world into physical stores.

6. Smart Learning and Safety: It helps workers learn from machines and creates smart environments that look out for people's safety and comfort.

7. Make New Stuff Faster: Companies can come up with new ideas and products more quickly, leading to more opportunities to make money.

8. Easy to Adjust and Grow: Edge computing lets companies easily change and expand their computer systems based on what they need, making it flexible and scalable.

Conclusion:

Edge computing is like having a smart helper right where you need it most. Instead of sending all your questions or tasks far away to a big computer (like asking a friend far away for help), edge computing does the job closer to you. This means things can happen faster, like getting instant answers or making devices work quicker. It's like having a mini-computer right beside you to handle tasks quickly and make everything more efficient.
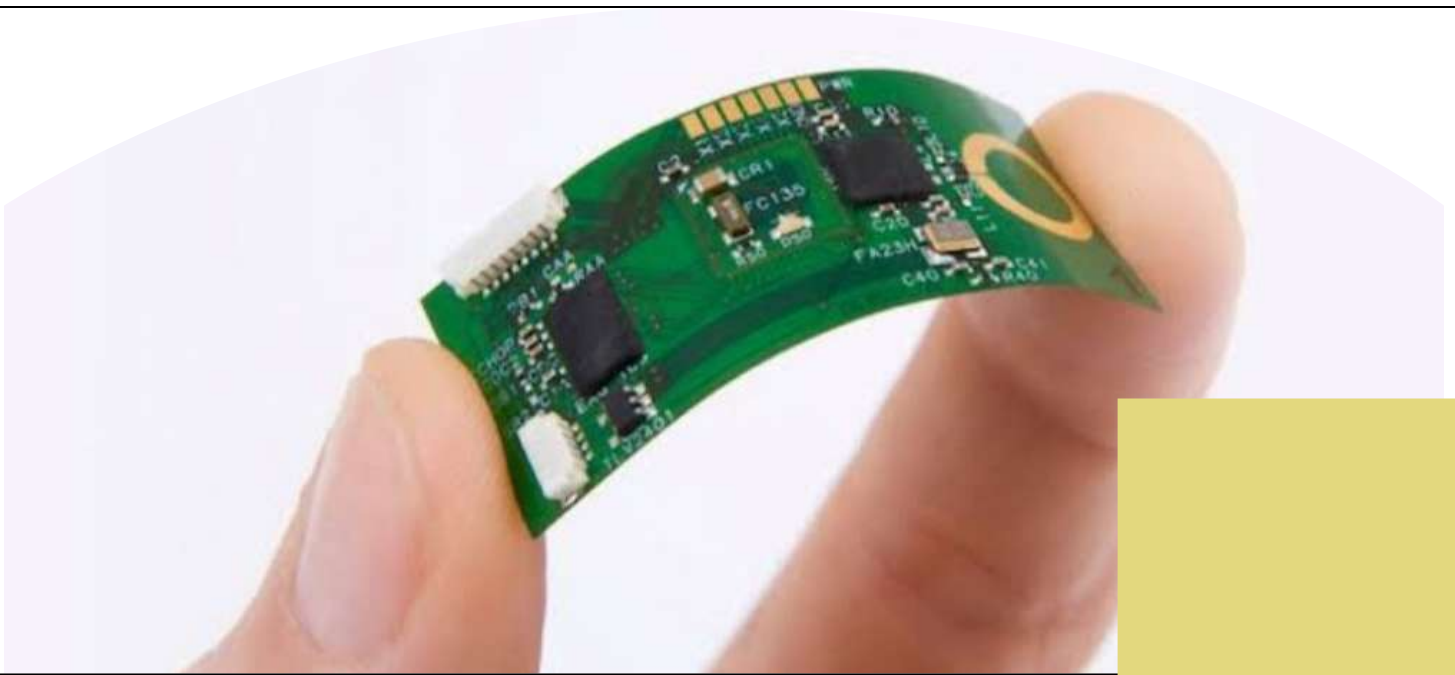
FLEXIBLE TECHNOLOGY AND WEARABLE TECHNOLOGY

By
HEMALATHA A
I YEAR

ABSTRACT :

This article explore the dynamic landscape of flexible electronic and wearable technology. Showcase the transformative impact of the innovation on our daily lives. From the materials Enabling flexibility to the intersection of fashion and technology. The piece navigate through the latest developments in the health monitoring, energy harvesting and augmented reality. It addresses challenges such as durability and privacy concerns. While envisioning a future where technology seemlessly integrates into the fabric of our lives. Join us on a journey through the evolving realm of a flexibility, electronics and witnesses the uniform possibility that redefine the boundary of personal technology.

INTRODUCTION :

The convergence of flexible electronics and wearable technology is reshaping our daily lives. Offering unprecedent possibility in terms of comfort ,functionality and connectivity. In this article we will dive into the cutting edge developments and transformative potential of these innovation.

1. The Rise of Flexibility : Explore the Materials and Engineering breakthroughs that enable the flexibility of electronic components. From the flexible displays to bendable circuitry. Discover how these advancements are redefined the design and form factor of the electronic devices

2.Wearable Health Tech Revolution : Examine the role of wearable devices in the revolution in health case. Discuss how flexible electronics enable the creation of comfortable unobtrusive health monitoring solutions, providing real-time data for improved diagnosis and patient care.

3. Energy Harvesting For Wearable : Uncover the latest developments in energy harvesting technologies that power wearable devices. From kinetic energy to solar power ,explore how these solutions contributes to longer battery life and sustainability in the wearable tech ecosystem.

4. Challenges And Solutions : Address the challenges faced in the development of flexible electronics and wearable. Such as durability, scalability and integration. Highlights the collaborative efforts offsets of researchers and industry leaders to overcome these obstacles.

5. The Future Landscape : A Paint of a picture of the future landscape of flexible electronics and wearable technology. Discussed the upcoming trends , potential, breakthroughs and the role these innovation might play in the border tech ecosystem.

Conclusion :

In conclusion, the fusion of flexible electronics and wearable technology is reshaping our world from health monitoring to stylish smart clothing. These innovations are breaking boundaries and enhancing our daily lives. Embrace the flexibility, embrace the future.

WEBSITE DEVELOPMENT

By
KEERTHANA K
I YEAR

ABSTRACT :

     Creating a website involves designing ,coding and structing web pages to deliver content or services to users. It includes frontend development and Backend development operations , databases. The abstract process planning. Wireframing , coding , testing and launching , ensuring a user friendly. Responsive and Secure digital platform.

REQUIREMENTS :

Hardware:
    processor : CORE i3
    Main memory : 4GB RAM
    HDD/SDD : 256GB
Software :
    Operating System : Windows 7 and above
    IDE : Visual Studio Code
    Server : XAMPP
    Database : My Sql

EXISTING SYSTEM :

There are numerous mobile shopping Website exist. Some of them are

- **Poorvika mobiles : Poorvika mobiles private limited India's Leading mobile retailer with its wings wide spread in south India and their reputation extends across the nation.**
- **Supreme mobiles : Supreme mobiles is a leading multi brand retail chain that deals in mobile phones.**

DISADVANTAGES IN EXISTING SYSTEM :

- **Limited to specific brand's products.**
- **Lack direct e-commerce functionality.**
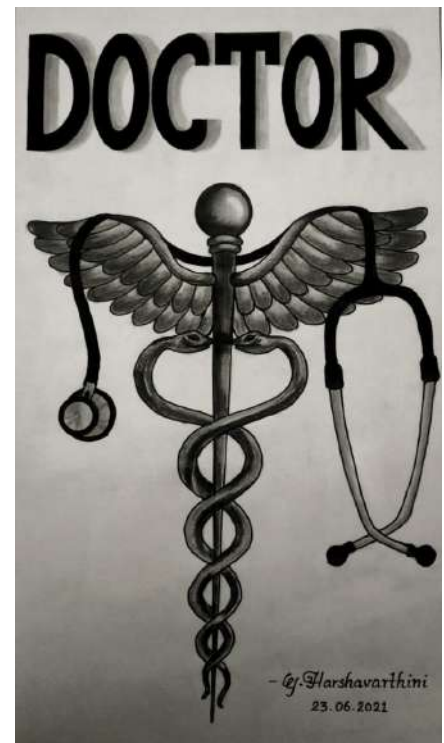- **Limited by geographical reach and store hours.**

PROPOSED SYSTEM :

The website for mobile store project aims to address the limitations of these existing systems by providing a dedicated user friendly and secure platform for mobile device shopping, combing extensive product information , user reviews and e-commerce functionality. This projects seeks to create a streamlined and comprehensive solution for both consumers and mobile device retailers. Enhancing the overall mobile shopping experience.
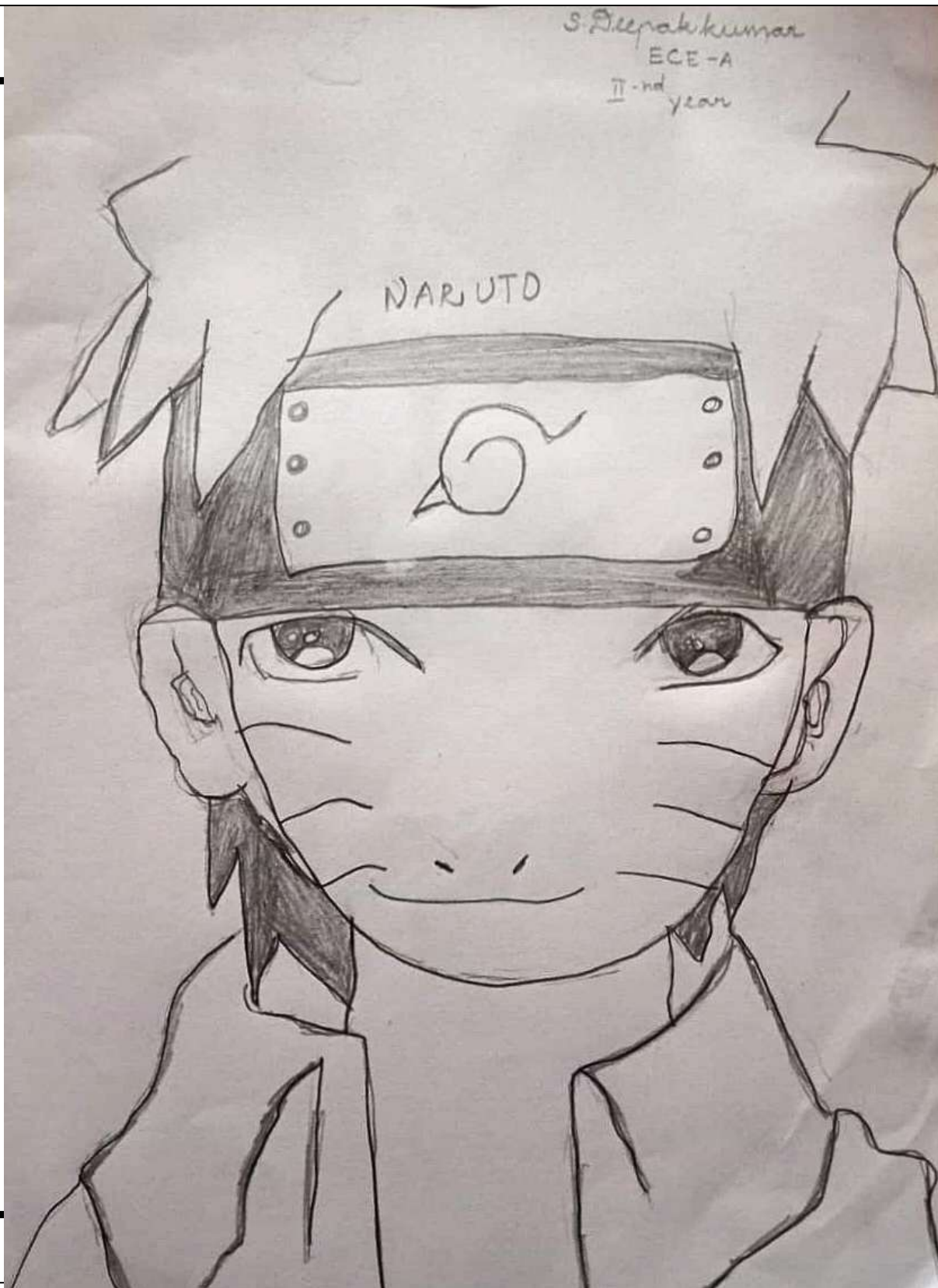
Art

Achhu
14-01-2023

- Achhu
14-01-2023

- G.Harshavarthini
22.06.2021

DOCTOR

- G.Harshavarthini
23.06.2021

**HARSHAVARTHINI G
III YEAR**

Poems/
கவிதைகள்

MY DAD

I know just what my
father was to me
And is unto this day;
And so unto my boy would
I am truly be
And in the selfsame way,
Lord, make me something
like my dad;
Give me a little of his will,
That good old Stubbornness he had
That helped him up the hardest hill,
My Father is a man like no other
he gave me life, nurture me.
Taught me , dressed me,
held me, shouted at me,
Kissed me , but most importantly
loved me unconditionally.
There are not enough words
I can say to describe,
Just how importance my father is to me
and what a powerful influence he continuous to be,
I LOVE YOU, DAD.
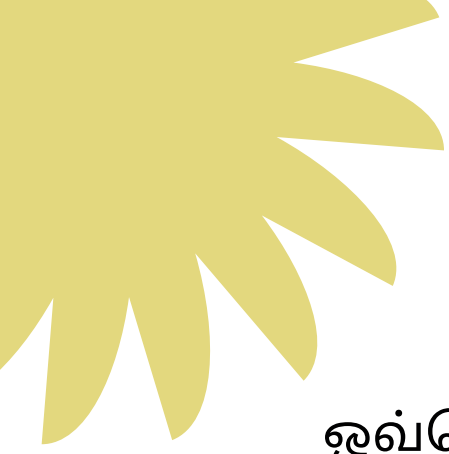
- DEEPAK KUMAR S
II YEAR

என் அம்மா

எங்கே பார்த்தாலும் காதலர்கள்,
என்னை தான்
காதல் செய்ய யாரும் இல்லை என்று
வீடு திரும்பினேன்...
காத்திருந்தால் எனக்காக என் அம்மா !

நான் வளரும் ஒவ்வொரு நொடியும்
உனக்கு பாரம் தான்,
தெரிந்தும் சுமக்கிறாய் பத்து மாதம்
வரை அல்ல... உன் ஆயுள் காலம் வரை !

இறைவன் எனக்கு கொடுத்த
முதல் முகவரி
உன் முகம் தான் அம்மா...!

பத்து மாதம் சுமந்தாய் வயிற்றில்,
பல வருடங்கள் சுமந்தாய் வாழ்வில்,
இனி என்றுமே சுமக்க நினைக்கிறன்.
உன்னை என் நெஞ்சில் அம்மா ... !

வயது வித்தியாசம் பார்ப்பதில்லை,
அம்மாவின் கொஞ்சலில் மட்டும்
இன்னும் குழந்தையாக!

ஒவ்வொரு நாளும்
கவலை படுவாள் ஆனால்
ஒரு நாளும் தன்னை பற்றி
கவலை பட மாட்டாள் அம்மா...

என் முகம் பார்க்கும் முன்பே !
என் குரல் கேட்கும் முன்பே!
என் குணம் அறியும் முன்பே !
என்னை நேசித்த ஓர் இதயம்!
என் அம்மா மட்டுமே !

-சீ.தீபக்குமார்
இரண்டாம் ஆண்டு

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erode, Tamil Nadu 638052, India
Lat 11.285502°

Vailkaalmedu, Tamil Nadu, India
7JMC+MC5, Vailkaalmedu, Tamil Nadu 638052, India
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Long 77.621288°
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Vailkaalmedu, Tamil Nadu, In
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நந்தா பொறியியல் கல்லூரி

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Conference Hall, Nandha Squar
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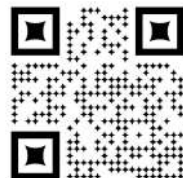## ELECTRONICS AND COMMUNICATION ENGINEERING

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