A.V.C COLLEGE OF ENGINEERING, MANNAMPANDAL, MAYILADUTHURAI

Approved by AICTE, New Delhi, Affiliated to Anna University, Chennai

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Department of Electronics and Communication Engineering

(Accredited by NBA)

"LEMON NEWSLETTER"

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Message from Head of the Department

I congratulate the final year students who have been selected for Internship training in reputed companies.

I expect from the students of four department to concentrate in their studies and execute well in the forthcoming University Exams.

I look forward from the faculties to impart their fullest effort and cooperation for the upcoming ISO, NAAC and NBA visits.

Dr. CHITRAVALAVAN

HOD/ECE

"Successful Goals"

"If you want to be happy, set a goal that commands your thoughts, liberates your energy and inspires your hopes."

"All who have accomplished great things have had a great aim, have fixed their gaze on a goal which was high, one which sometimes seemed impossible."

"Success is the progressive realization of a worthy goal or ideal."

"You have to set goals that are almost out of reach. If you set a goal that is attainable without much work or thought, you are stuck with something below your true talent and potential."

"The trouble with not having a goal is that you can spend your life running up and down the field and never score."

Faculty Corner:

7G TECHNOLOGY AND BEYOND

- ***Dr.K.R.Vinothini, AP/ECE***

As wireless communication continues to evolve, the next generation 7G wireless communication promises to deliver even faster data speeds, lower latency, and higher capacity than 5G and 6G. The development of 7G networks is expected to leverage advancements in terahertz waves, massive MIMO, and artificial intelligence to provide an even more seamless and efficient wireless communication experience. This paper provides an overview of the current state of research on 7G wireless communication technology including potential areas, benefits and challenges. Furthermore, we explore the possible applications of 7G technology in various industries, such as healthcare, transportation, and entertainment.

Potential areas of impact with 7G technology Although the capabilities of 7G technology are yet to be determined, the potential areas of application have been identified .These areas provide a simplified overview of the technology's potential offerings.

Threat detection: 7G could possibly enable the development of highly advanced sensors and surveillance systems, which could detect threats such as weapons, explosives, and intruders with greater accuracy and speed.

Crime control: 7G could potentially assist law enforcement agencies in tracking and identifying criminals by leveraging advanced data analytics, machine learning, and biometric technologies.

Mind reading: This is a highly controversial and hypothetical use case of 7G technology. If such capabilities are ever developed, they could potentially allow for the monitoring of individuals' thoughts, emotions, and intentions.

Health monitoring: 7G could potentially enable the development of more advanced medical sensors and wearable devices, which could monitor vital signs and health indicators in real-time, helping to prevent and manage diseases

Facial recognition/expressions: 7G could potentially enhance the accuracy and speed of facial recognition technology, enabling it to detect and recognize individuals even in challenging conditions, such as low light or obscured faces

3D Image synthesis: 7G could potentially allow for the creation of highly detailed and realistic 3D models and simulations of objects and environments, which could have applications in areas such as virtual reality and gaming

Air quality measurements: 7G could potentially enable the development of highly sensitive sensors and monitoring systems, which could measure and analyze air quality in real-time, helping to identify and mitigate environmental risks.

Personalized medicine: 7G could potentially enable the development of highly personalized and targeted medical treatments, based on advanced genetic analysis, biomarker detection, and realtime health monitoring

Disaster preparedness: 7G could potentially assist in disaster management by providing realtime data and analytics to first responders and emergency management teams, helping them to make more informed decisions and respond more effectively.

Gas and toxicity sensing: 7G could potentially enable the development of more advanced gas and toxicity sensors, which could detect and analyze hazardous chemicals and pollutants in realtime, helping to prevent and mitigate

environmental risks [12]. IoT device management: 7G could potentially offer improved connectivity and interoperability for Internet of Things (IoT) devices, enabling more seamless and efficient management and control of smart devices and systems .

Autonomous systems: 7G could potentially enable the development of highly advanced autonomous systems, such as self-driving cars and drones, which could operate with greater speed, precision, and safety .

Agriculture and food production: 7G could potentially assist in the optimization of agriculture and food production through the use of advanced sensors, robotics, and data analytics, helping to increase yields and reduce waste.

Space exploration: 7G could potentially enable the development of more advanced space exploration technologies, such as highly sensitive telescopes and robotic probes, which could help to unlock new discoveries and insights about the universe .

Advanced manufacturing: 7G could potentially enable the development of highly advanced manufacturing systems, such as 3D printing and nanotechnology, which could revolutionize the production of goods and materials .

Manufacturing and Industry: 7G technology could have a significant impact on the manufacturing and industry sector, enabling the development of advanced systems for automation, remote operation, and predictive maintenance. With its advanced connectivity and low latency, 7G could enable real-time monitoring and control of manufacturing systems, reducing downtime, improving efficiency, and enhancing safety.

Financial systems: 7G could potentially assist in the development of more advanced financial systems and technologies, such as blockchain and crypto currency, which could provide greater security and efficiency in financial transactions.

Environmental monitoring: 7G could potentially enable the development of more advanced sensors and monitoring systems for tracking and analyzing environmental conditions, such as water quality, wildlife habitats, and climate change.

Cyber Security: 7G could potentially assist in the development of more advanced cyber security systems and technologies, such as quantum encryption and AI-powered threat detection, which could help to protect against cyber-attacks and data breaches

Public Services and Governance: 7G technology could impact public services and governance positively, by enabling the development of advanced systems for e-government, citizen engagement, and public safety. The technology's advanced connectivity and low latency could allow for real-time communication between citizens and government, improving access to public services and enhancing public safety and security.

Retail and E-commerce: 7G technology could have a significant impact on the retail and ecommerce sector by enabling the development of advanced systems for personalized marketing, inventory management, and logistics. The technology's advanced connectivity and low latency could allow for real-time tracking of consumer behavior, which would facilitate more targeted marketing and better inventory management.

Virtual and Augmented Reality: 7G networks could facilitate the creation of more immersive and interactive virtual and augmented reality experiences with ultra-low latency and high bandwidth .

Telemedicine: 7G technology could enhance telemedicine capabilities by enabling highresolution video conferencing, real-time monitoring of patient data, and more .

Smart Cities: 7G networks could enable the development of more advanced smart city applications, such as intelligent traffic management systems, advanced public safety systems, and more .

Industrial Automation: 7G networks could facilitate the development of advanced industrial automation systems with real-time communication, which can lead to more efficient and flexible manufacturing processes.

Energy Management: 7G networks could enable the creation of smart energy management systems that can better monitor and optimize energy consumption, leading to reduced energy waste and improved sustainability [21].

Gaming: With the low latency and high bandwidth of 7G networks, it could be possible to create more sophisticated and immersive online gaming experiences that take advantage of advanced technologies such as cloud gaming, virtual and augmented reality.

Education and training: 7G could potentially revolutionize education and training through the use of advanced technologies, such as virtual and augmented reality, personalized learning algorithms, and real-time feedback systems .

Significant Advancements in Wireless Communications with 7G

- ***Mrs.R.Ramya, AP/ECE***

The development of 7G networks is expected to bring significant advancements in wireless communication technology, leveraging advancements in ***terahertz waves, massive MIMO, and artificial intelligence***. These developments will enable an even more seamless and efficient wireless communication experience. Terahertz waves, which are electromagnetic waves with frequencies ranging from 0.1 to 10 terahertz (THz), are expected to play a key role in the development of 7G networks.

Massive MIMO technology is expected to play a significant role in the development of 7G networks, using a large number of antennas to increase the network capacity and improve network coverage while allowing for more efficient use of radio spectrum. Although this technology has already been used in 5G networks, 7G is expected to take it to the next level by increasing the number of antennas and using advanced beamforming techniques to enhance network performance

Artificial intelligence (AI) is also expected to be a key enabler of 7G networks.

Quantum Computing is a rapidly advancing field that is expected to have a significant impact on wireless communication technology.

Internet of Things (IoT) is a rapidly growing network of interconnected devices, sensors, and machines that are capable of communicating with each other.

Beamforming is a technique used in wireless communication networks to direct the transmission and reception of signals towards specific devices or locations.

Network Function Virtualization (NFV) is a technology that allows network functions, such as firewalls, routers, and load balancers, to be virtualized and run on commodity hardware, rather than on specialized hardware.

Cognitive Radio is a wireless communication technology that allows devices to dynamically adjust their transmission parameters based on the radio environment and available spectrum.

Wireless Power Transfer is a technology that allows for the wireless charging of devices, such as smartphones or IoT devices, over a short distance. 7G networks could enable more efficient wireless power transfer and lead to the development of new types of wireless charging technology .

Dynamic Spectrum Sharing is a technology that allows for the simultaneous use of a single spectrum band by multiple wireless communication technologies, such as 5G and Wi-Fi. This can improve network efficiency and reduce interference, and is expected to be a key feature of 7G networks.

Student Corner:

"INDIA IS ON THE MOON"

- S. ASHIKA, IV ECE

Last month, India made history when it became the first country to land a lunar mission near the Moon's south pole.

Chandrayaan-3's lander and rover – called Vikram and Pragyaan – spent about 10 days in the region, gathering data and images to be sent back to Earth for analysis.Earlier this month, scientists put them to bed as the Sun began to set on the Moon – to be able to function, the lander-rover need sunlight to charge their batteries. The country's space research agency Isro said it hoped that they would reawaken "around 22 September" when the next lunar day breaks.

Isro has provided regular updates on their movements and findings and shared images taken by them.

These updates have excited many Indians, but others have been asking about the significance of these discoveries.

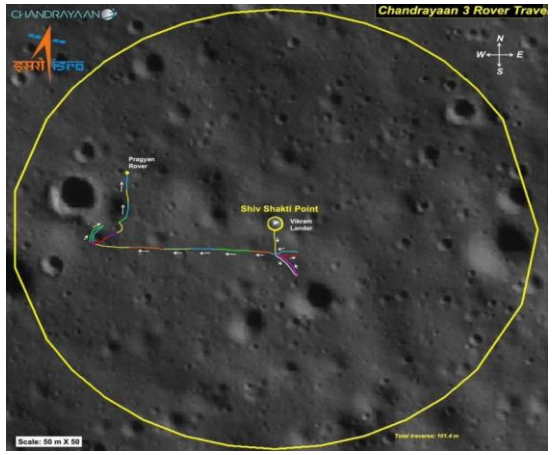
The BBC asked Mila Mitra, a former Nasa scientist and co-founder of Stem and Space, a Delhi-based space education company, to pick some of Chandrayaan-3's major findings and explain their significance.

The distance covered – and craters avoided

Hours before the rover was put to bed on 2 September, Isro said Pragyaan "has traversed over 100m [328 feet] and is continuing".That's quite a long way to travel for the six-wheeled rover, which moves at a speed of 1cm per second.

What is also significant, Ms Mitra says, is that it has been able to stay safe and avoid falling into the craters that dot the Moon's little-explored south pole region.

The rover, she says, has a special wheel mechanism – called rocker bogie – which means that all its wheels don't move together, helping it traverse up and down, but it may not be able to climb out if it falls into a deep crater. So it's important to make it go around the craters or even retrace its steps. And that, Ms Mitra adds, is done by scientists at the command centre who are "watching the Moon through the rover's eyes".



"The rover is not automated and its movements are controlled from the command centre which acts on the basis of the pictures it sends.

"There's a slight delay before they reach the command centre because of the circuitous route they take – Pragyaan sends them over to the lander which sends them on to the orbiter to pass them on to Earth."So, by the time the command reaches the rover, it's a few steps closer to the threat.But the fact that it has managed to navigate safely around two craters shows that it's able to communicate really quickly with the command centre, Ms Mitra adds.

INTRESTING FACTS

- T.Meenatchi, IV ECE

- A Day on Venus is Longer than a Year on Venus: Venus has an extremely slow rotation, taking about 243 Earth days to complete one rotation, while it only takes about 225 Earth days for Venus to orbit the Sun.
- The Eiffel Tower Can Be Taller in the Summer: Due to the expansion of iron in the heat, the Eiffel Tower can grow by up to 6 inches (15 centimetre's) during the summer.
- The Loudest Animal on Earth: The blue whale is the loudest animal on Earth. Its calls can reach up to 188 decibels, which can be heard for hundreds of miles underwater.
- The average person will spend six months of their life waiting for red lights to turn green.
- Honey never spoils. Archaeologists have found pots of honey in ancient Egyptian tombs that are over 3,000 years old and still perfectly edible.
- The shortest war in history was between Britain and Zanzibar on August 27, 1896. It lasted only 38 minutes.
- Sloths take two weeks to digest their food.
- The Apollo 11 guidance computer, which helped land humans on the moon, had only 64KB of memory.
- The modern computer mouse was invented by Douglas Engelbart in 1963 and was made of wood.
- The longest time between two twins being born is 87 days.

APTITUDE QUESTIONS

- Deepa .M , IV ECE

- 1.Today it is Thursday, after 132 days, it will be_____
  Answer: Wednesday
- 2.Find the H.C.F, if the numbers are in the ratio of 4: 5: 6 and their L.C.M. is 2400? **Answer: 20**
- 3.Find the speed of the boat in still water, if a boat covers a certain distance upstream in 2 hours, while it comes back in 1`1/2` hours. If the speed of the stream be 3 kmph? **Answer:21kmph**
- 4.The rate at which a sum becomes four times of itself in 25 years at S.I, will be _____ **Answer:12%**
- 5.A guy bought 10 pencils for Rs. 50 and sold them for Rs. 60.What is his gain in terms of percentage? **Answer:20%**

- 6.If 9th of the month falls on the day preceding Sunday, then on what day will 1st of the month fall? **Answer: Friday**
- 7.The number of oranges in three basket are in the ratio 3:4:5. In which ratio the number of oranges in first two basket must be increased so that the new ratio becomes 5:4:3? **Answer: 2:1**
- 8.Fresh fruit contains 68% water and dry fruit contains 20% water. How much dry fruit can be obtained from 100 kg of fresh fruits? **Answer: 40**
- 9.Find the odd man out? 396, 462, 572, 427, 671, 264 **Answer:437**
- 10.In a single throw of two dice, find the probability that neither a doublet nor a total of 8 will appear? **Answer:5/18**

RIDDLES

- D. Padmapriya, IV ECE

1. A man walks 1 mile south, 1 mile east, and then 1 mile north. He returns to the origin of his journey. How is this possible?

ANSWER: He started his journey at the northpole he would end at where he started. At the northpole here is no east or west only south. Once he walks a mile south he would have east and west as well as north and south. Granted north would only consist of 1 mile. Walking a mile north would put him back at the northpole which is a single point.

2. I have keys but no locks.
   I have space but no room.
   You can enter, but you can't go outside.
   What am I?

ANSWER: keyboard.

3. You have 12 pills and they all got the same weight, except for one, which hasn't got the same weight. You don't know if it is heavier or easier. You have one scale to weight the pills. You now have to find out, which pill is the right one (the one with a different weight), but you can use the scale only three times. How do you know, which one is the right one?You have 12 pills and they all got the same weight, except for one, which hasn't got the same weight. You don't know if it is heavier or easier. You have one scale to weight the pills. You now have to find out, which pill is the right one (the one with a different weight), but you can use the scale only three times. How do you know, which one is the right one?

ANSWER: E = easier in "1", H = heavier in "1". 1: Weight 4:4. If they balance go to "2", if they don't balance, go to "3". 2: Balance 1:1 of the pills you didn't weight yet. Then weight one you didn't weight and one you did weight. If they balanced in the first weighing, and balanced in the second weighing, the last pill is the right one. If they balanced in the first weighing and didn't balance in the second, the one you didn't use before is the right pill. If they didn't balance at all, it's the pill you weighed twice. If they didn't balance in the first weighing, but balanced in the second, it is the first pill. 3: Weight EHH : EHH. If they balance, weight one you already weighed, with an unweighed and go to "4". If they don't balance go to "5". 4: If they balance, the one you didn't weight at all is the right pill. If they don't balance, the one you

only weighed once is the right one. 5: Give away every pill that was once easier AND once heavier. You should only have EHH left. Weight H:H. If they balance, E is the right one. If the don't balance, the one which was only heavier the whole time, is the right pill.

4. I am a 8 Letter Word.
   I am kept Secret from Everyone.
   My 2nd, 3rd, 4th Letter Spell an Animal.
   My 4th, 5th, 6th, 7th, 8th Letter is a Weapon.
   My 1st, 2nd, 8th Letter is used for Writing an Exam.
   My 3rd, 4th Letters are the Same.
   Who am I?
   ANSWER: Password.

5. A mother has six children and five potatoes. How can she feed each an equal amount of potatoes? Do not use fractions.

   ANSWER: By making mashed potatoes.

6. I'm not a bird, but I have feathers. I'm not a tree, but I have leaves. I'm not a ship, but I have a mast. What am I?

   ANSWER: A book.

7. Three philosophers are taking a nap under a tree. While they're asleep, a small boy smears their noses with red berries. When they awake, they each begin to laugh, thinking the other two are laughing at each other. But then one philosopher stops laughing, realizing his nose is red too. How did he come to this conclusion?

   ANSWER: Lets call the philosophers A, B and C. A reasoned that B was confident his nose wasn't red. If B saw As nose wasn't red, he would be surprised that C was laughing, because C would have nothing to laugh at. But B wasn't surprised, therefore, A correctly reasoned his nose was smeared.

8. I am an odd number. Take away a letter and I become even. What number am I?
   Answer: Seven

9. I'm a technique used to transmit multiple signals simultaneously over a shared communication channel. What am I?

   Answer: Multiplexing

10. I'm a device used to measure the phase difference between two electrical signals.
    What am I?

    Answer: Oscilloscope

Editor's Desk:

10 Benefits of Green Tea that will make you rethink your morning Coffee

1. Green Tea is a Natural Stimulant.
2. Green Tea might help fight off Cancer.
3. Minimal processing leaves nutrients intact.
4. Green tea is associated with lower heart disease risk.
5. Green tea keeps bones strong.
6. Green tea balances your ratio of good and bad cholesterol.
7. Green tea is connected to Longer life.
8. It may protect your brain against Alzheimer's disease.
9. It may also provide protection against Parkinson's disease.
10. Drinking green tea keeps your mouth healthy

Green tea can help you reduce your sugar intake.

Send your suggestions to:

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1. M.Yogeshwaran, IV ECE
2. S.Ashika, IV ECE
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Department Vision

To create globally competent engineers in Electronics and Communication Engineering to meet the industrial progress for betterment of the society

Department Mission

- To create an academic ambience for quality education in the field of Electronics and Communication Engineering
- To make the best use of modern tools and software for teaching and research activities
- To promote industry-institution interaction for skill-based learning of students from rural society
- To inculcate moral and ethical values with a sense of professionalism.

PROGRAMME EDUCATIONAL OBJECTIVES (PEO's):

1. To provide the students with a strong foundation in the required sciences in order to pursue studies in Electronics and Communication Engineering.
2. To gain adequate knowledge to become good professional in electronic and communication engineering associated industries, higher education and research.
3. To develop attitude in lifelong learning, applying and adapting new ideas and technologies as their field evolve
4. To prepare students to critically analyze existing literature in an area of specialization and ethically develop innovative and research oriented methodologies to solve the problems identified.
5. To inculcate in the students a professional and ethical

attitude and an ability to visualize the engineering issues in a broader social context.

PROGRAMME OUTCOMES:

Engineering Graduates will be able to:

1. **Engineering knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
2. **Problem analysis:** Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
3. **Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
4. **Conduct investigations of complex problems:** Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
5. **Modern tool usage**: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.
6. **The engineer and society:** Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
7. **Environment and sustainability:** Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
8. **Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
9. **Individual and team work:** Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
10. **Communication:** Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
11. **Project management and finance:** Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
12. **Life-long learning:** Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

PROGRAMME SPECIFIC OUTCOMES (PSOs)

- PSO1: Design, develop and analyze electronic systems through application of relevant electronics, mathematics and engineering principles
- PSO2: Design, develop and analyze communication systems through application of fundamentals from communication principles, signal processing, and RF System Design & Electromagnetics.
- PSO3: Adapt to emerging electronics and communication technologies and develop innovative solutions for existing and newer problems