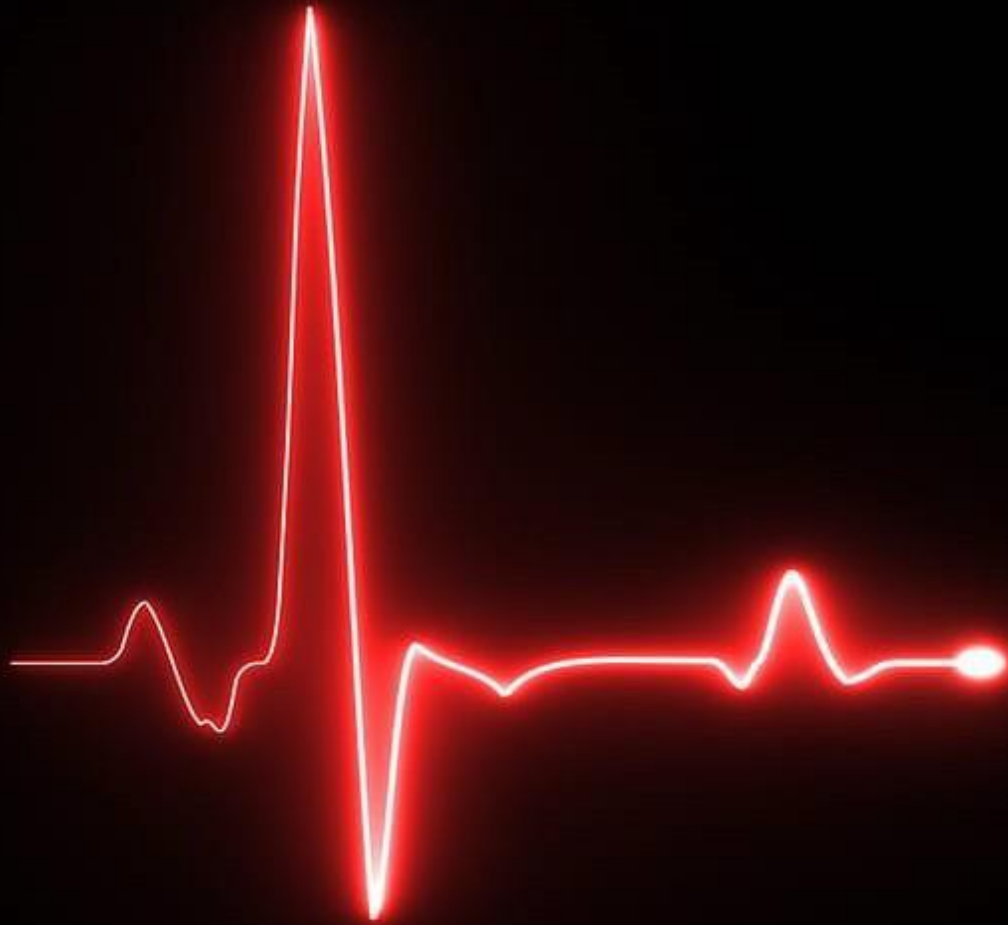


THE PULSE

NEWSLETTER
DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING



Vision

To emerge as a centre of academic excellence in the field of Electronics & Communication Engineering to address the dynamic needs of the industry upholding moral values.

Mission

- Impart in-depth knowledge in Electronics & Communication Engineering to achieve academic excellence.
- Develop an environment of research to meet the demands of evolving technology.
- Inculcate ethical values to promote team work and leadership qualities befitting societal requirements
- Provide adaptability skills for sustaining in the dynamic environment

MESSAGE FROM FACULTY

Antennas for IoT devices in complex environment

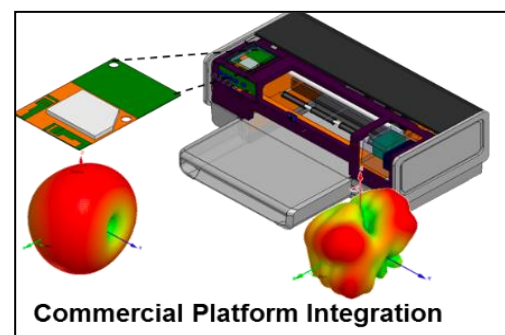
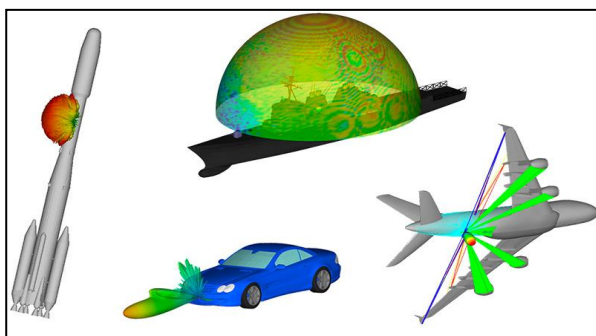
Internet of Things (IoT) projects rely on wireless to connect devices, but the best type of connection, and therefore antenna technology, depends on the application in question. Where an application requires critical wireless network performance, terminal antennas can provide the ability to achieve the highest levels of performance, especially in environments where other RF interference is present. Integrating multiple antennas into high-performance small IoT designs has become a standard requirement, posing significant challenges for IoT product developers. Smaller patch antennas are now common in portable, wearable and small IoT devices, mainly because they can provide a high level of performance in a small form factor, but also because they are widely available and inexpensive. Integration of RF electronics with the antenna, enables miniaturization and increased efficiency. It's not uncommon for IoT applications to include as many as 12 antennas in a phone-sized device. There are already commercial examples of using multiple antennas to work with 5G networks and support IoT applications.

With their optimized multi-band capabilities, the antennas are ideal for industrial IoT applications in cabinets. The low cost and tunable characteristics of an antenna make them a suitable candidate for RFID and IoT applications. The platform stability of the antenna allows it to be integrated with IoT sensors that can be used to detect environmental and process influences. To improve system performance and re-configurability in modern communication devices, grouped equivalent circuit models are sometimes used, which may require complex modeling and mathematical analysis. Instead of viewing antennas as passive products, whether external or embedded, engineers should view them as an integral part of building IoT applications.

There are many methods for designing an efficient platform compatible antenna, such as impedance analysis, the use of metamaterials (electromagnetic gap (EBG), artificial magnetic conduction (AMC)) and circuit analysis. Characteristic mode analysis (CMA) combined with characteristic mode theory (TCM) is becoming the predominant systematic tool for designing efficient terminal antennas. In this chapter, we will look at some commonly used IoT antenna technologies, their applications, and some of the key factors influencing the selection of an antenna for IoT product development. Advanced wireless technologies have had a huge impact on the evolution of IoT antenna technology and antenna designs, enabling ultra-compact antennas with high efficiency and performance. Antenna characteristics are primarily related to resonant frequency and return loss, which must be studied under bending conditions to evaluate the suitability of a real-time IoT application.

There are also many design factors to consider, including the proximity of the antennas to other components, the location of the antennas on the board, the antenna grounding requirements, and the level of interference in the environment in which the device will be used. Determining accessibility and ground floor distance if needed, efficiency requirements, device size and frequency bands will help narrow down your antenna selection and determine which type of antenna is best for your application. Keep in mind that the antenna should be located away from other "noisy" components such as batteries, motors, and metal parts that can interfere with and interfere with your wireless network.

-Dr. Naveen Kumar



EVENTS

Highlights of the Month:

- Organized an Industrial Visit to 7th Bengaluru Space Expo 2022 on 06.09.2022 for 3BTEC&3BTELCs students coordinated by Dr. Naveenkumar, Col. Jai Govind, Ms. Indu.k & Ms. Priyanka Biswas and on 07.09.2022 for 5BTEC&5BTELCs students coordinated by Dr. Sarwesh.P, Dr. S.Chidambaram, Dr. S.Sujatha & Dr. Amir. A.
- Department of ECE and ELCS students actively participated in Engineers Day Project Expo, ICETECH 2022 and secured the 1st Prize for Smart Room Light System by Shashidhar & Team, 2nd Prize for Automatic Wind Wiper by Azeem Ali & Team and Password Based Circuit Breaker by Aditi & Team, 3rd Prize for Smart Dustbin by Tejaswini & Team, held on 15.09.2022.
- Department Faculty meeting with the primary agenda on the ensuing NAAC peer team visit conducted on 12.09.2022.
- Dr. Jesuwanth Sugesh R.G has been appointed as Assistant Professor in the Department of ECE during the academic year 2022-2023 on 26.09.2022.
- Dr. Chidambaram. S participated in “Industry Powered Faculty Development Programme on Emerging Technologies” at L&T Head Quarters, Chennai held during 28.09.2022 to 29.09.2022.
- Patent granted for the work “Conjugate of Estradiol and applications thereof” submitted by Dr. Iven Jose & Dr. Vinay Jha Pillai with the Patent No. 407786, granted on 27.09.2022.
- Dr. Suganthi.S & Prof. Shahikumar.D published an article “Experimental Verification of Gain and Bandwidth Enhancement of Fractal Contoured Metamaterial Inspired Antenna” in Advanced Electromagnetics Journal, Sep 2022.
- Dr. Praghash. K published an article “Development of an Efficient and Secured E-Voting Mobile Application Using Android” in Mobile Information Systems Journal, Sep 2022.
- Prof. Sushanth. G presented a paper “Experimental Investigations on Turbine-Generator Shaft under Sub synchronous Resonance” in International Conference On Communication, Computing And Electronic Systems (ICCCES 2022), held on 15.09.2022.

STUDENT CONNECT

AI vs Human: survival of the fittest?

Be it a task close to impossible or something as small as simple calculations, we now depend on the largely growing Artificial Intelligence industry. It has come a long way from watching it as a sci-fi animation on the screen to reality. It has become part of our subconscious routine and therefore fearfully strikes a debate on AI vs Human Intelligence. While AI constantly grows in ideas and research, at one point we stop to think if “AI is sufficient in itself?”. How justified is thinking whether AI will replace humans? AI is an interdisciplinary science that connects concepts and tools from multiple fields like computer science, cognitive science psychology, neuroscience, and mathematics whereas human Intelligence refers to humans’ intellectual capability that allows us to think, learn from different experiences, understand complex concepts, apply logic and reason, solve mathematical problems, recognize patterns, make inferences and decisions, retain information, and communicate with fellow human beings. What makes it unique is the valued addition of emotions and self-awareness that can help human intelligence to mold itself to the complexity and scrutiny of the problem.

One of the earliest authors to express serious concern that highly advanced machines might pose existential risks to humanity was the novelist Samuel Butler, who wrote the following in his 1863 essay “Darwin among the machines”: ‘The upshot is simply a question of time, but that the time will come when the machines will hold the real supremacy over the world and its inhabitants is what no person of a truly philosophic mind can for a moment question.’

AI systems can be challenging to align, and misaligned systems can malfunction or cause harm. It can be difficult for AI designers to specify the full range of desired and undesired behaviors. Therefore, they use easy-to-specify goals that omit some desired constraints. However, AI systems exploit the resulting loopholes. As a result, they accomplish their proxy goals efficiently but in unintended, sometimes harmful ways (reward hacking). Are many scholars concerned about the AI existential risk believe that the best approach is to conduct substantial research into solving the difficult "control problem" to answer the question: what types of safeguards, algorithms, or architectures programmers can implement to maximize the probability that their recursively improving AI would continue to behave in a friendly, rather than destructive, manner after it reaches superintelligence? This thinking would create a balance between human and artificial intelligence which largely affects the right development of the world.

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**Kindly share your thoughts and research experiences via e-mail to our team,
and be featured in next month's issue!**