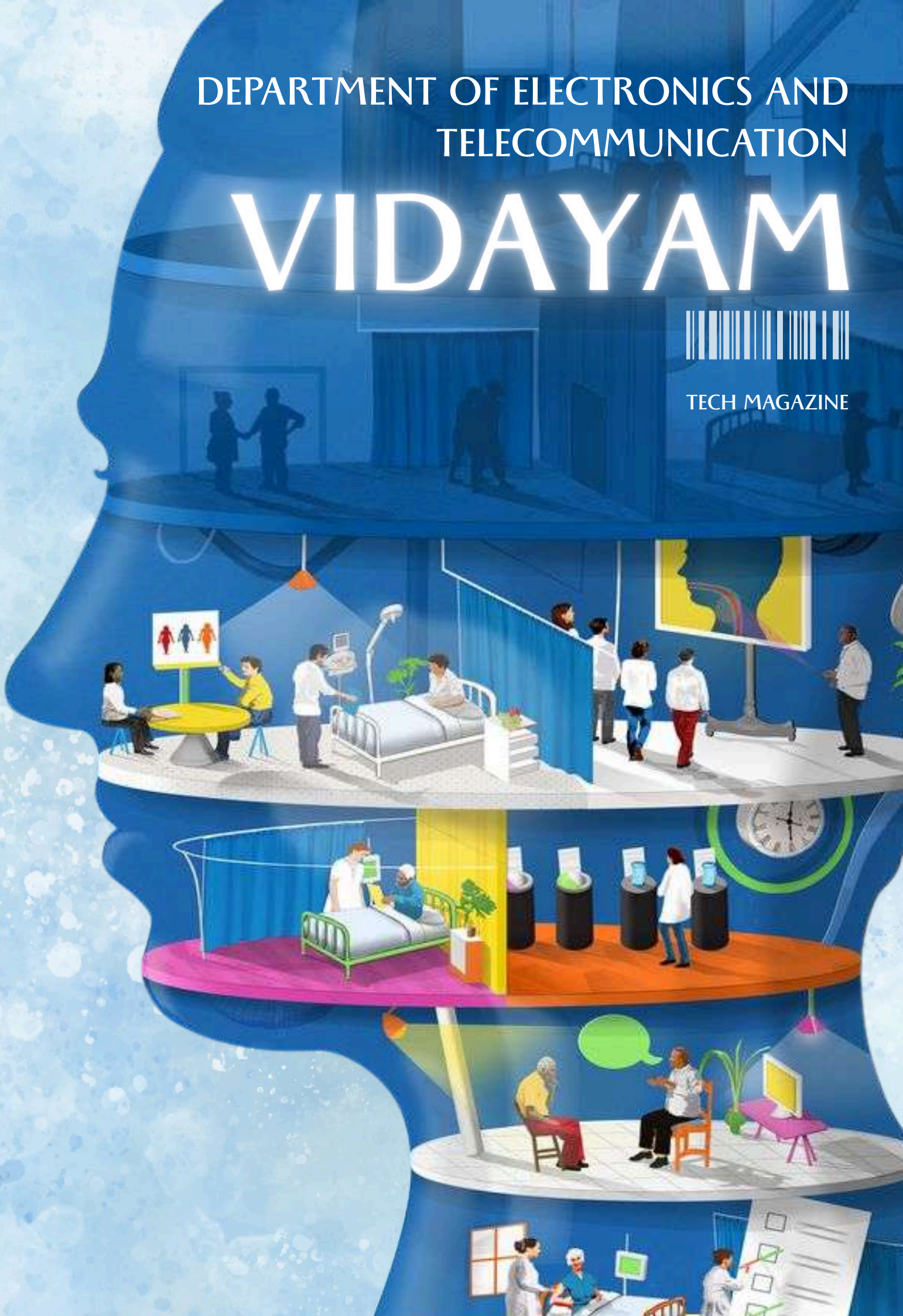
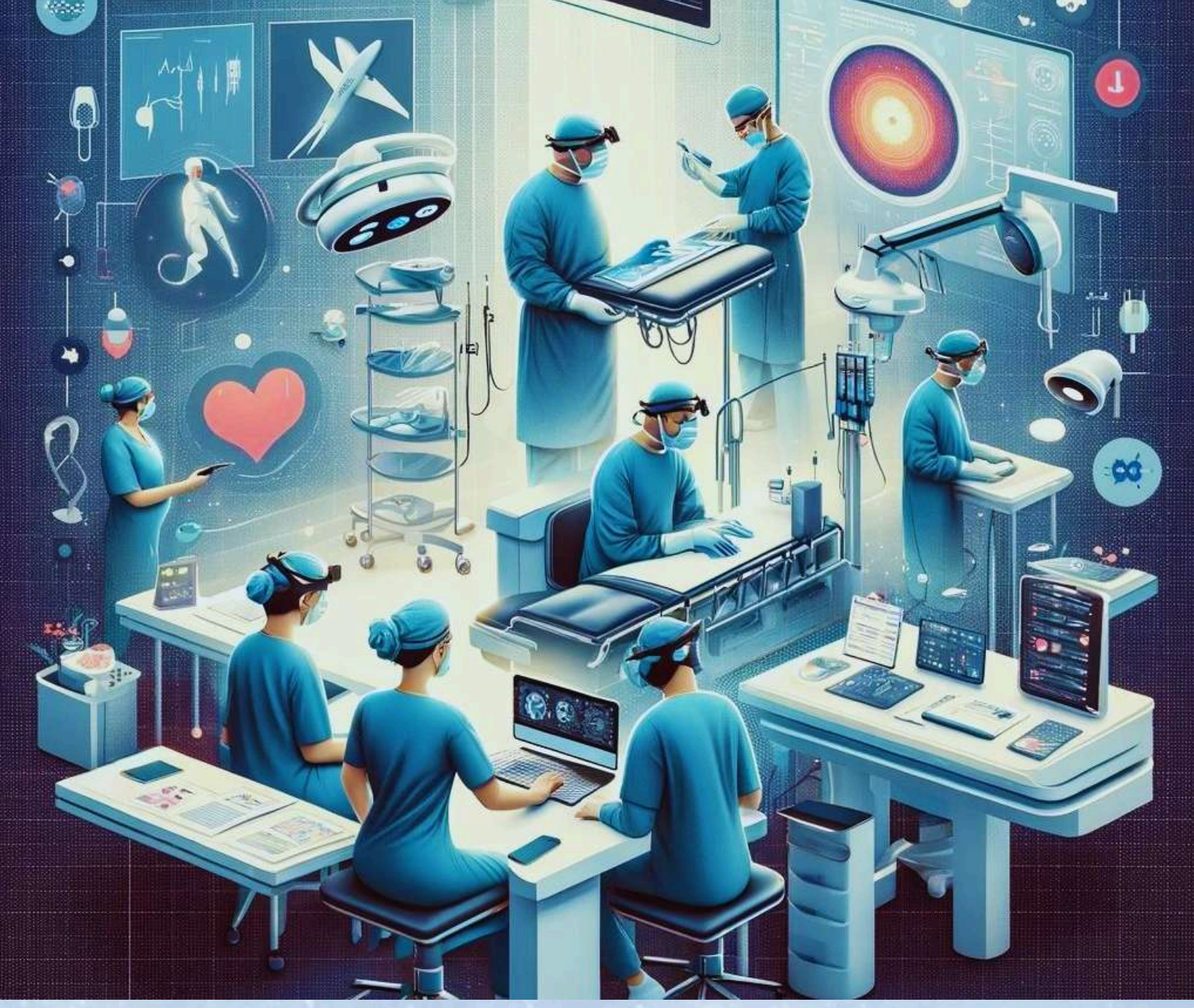
DEPARTMENT OF ELECTRONICS AND TELECOMMUNICATION

# VIDAYAM

TECH MAGAZINE





# TABLE OF CONTENTS

# Vision and Mission of the Department

## Department Vision

To emerge as a leading source for Electronics and Telecommunication Engineering, fostering globally proficient engineers to meet the demands of evolving industry and society.

## Department Mission

- Foster collaboration with industry to facilitate the acquisition of cutting-edge technologies and contribute to the generation of up-to-date knowledge, enhancing employability and sustainability.
- Encourage innovation, research, and development, creating an environment conducive to higher education, entrepreneurship, and lifelong learning
- Cultivate leadership qualities infused with social and ethical values, providing a platform for their development.

# FOREWORD

## MY STUDENTS, MY REFLECTION

It is my great fortune that I have chosen such a noble profession. There is great praise for teachers in the scriptures. In one of the Sanskrit hymns, the teacher has been compared with Brahma, Vishnu and Maheshwara. Therefore, I should never forget that I'm doing great service in moulding the lives and the character of thousands of students within the four walls of the classroom. Students come to me with great expectations that they will get something from me. My duty is not only to teach them the syllabus but also to help them build character. Students coming out of the educational institute with character and integrity alone can build this great nation. If I can humbly do that, I will be doing immense service to my nation and to the youth.

"Whatever a great man does, another person does the very same thing; whichever benchmark he sets, the world follows it!" I think my life itself will be a great source of inspiration for students. Teaching without practising will not produce any positive results. As modern students are very intelligent, they will watch our lives and character. If they don't find those things in practice, they will not care for our world. If we sincerely love our students and are really interested in their welfare, they will certainly follow our footsteps. We must develop infinite patience and forbearance.

I never condemn my students for their shortcomings and mistakes, but rather highlight their good qualities and successes. If we speak kind words to students and encourage them, they are bound to improve in time. If we can give them positive ideas, they will grow up to be men and learn to stand on their own feet.

In language and Literature, in poetry and art, in everything, we must point out not the mistakes that people make in their thoughts and actions but the way in which they will gradually be able to do things better. We should be able to enter the hearts of our students. They should find in us –their friend, guide and philosopher. Then only they will open their hearts and will express their problems. Our approach to their problems should be positive, and we should try our utmost to help in solving their problem if it is within our reach. This intimacy and mutual affection will strengthen our relationship between the teacher and the student.

Once we put them on the right track, they will grow up as real men and women of real character and integrity. They will remain grateful to us throughout their lives for our great service rendered to them; on the other hand, we will get job satisfaction, which will result in peace and happiness.

-DR MANGAL SINGH

## Dear Reader,

For over a century, we have listened to the body's electrical secrets, turning invisible rhythms into life-saving data. That conversation changed forever in 1958 with the first implantable pacemaker—the dawn of a **true symbiosis** between human and machine. For the first time, an electronic device was sealed within the body to actively sustain life. Yet, it was still a one-way street.

Until now.
Today, that conversation is becoming a true dialogue. We are beginning to speak back, not with simple pulses, but in a rich language of data, sensors, and intelligent feedback.
Welcome to the frontier where the living cell and the silicon chip don't just communicate—they converge. The promise is to shift medicine from being reactive to predictive, offering care as unique as the individual it serves.

Inside, we explore the technology and the pioneers building this new reality. This is the next chapter in human health, and it's happening now. We invite you to join us.

**Sincerely,**
**The Editors**

# ARTICLES

~ MANTAVYA ANAND, SY

# BIOMEDICAL SIGNAL PROCESSING: THE BRIDGE BETWEEN MEDICINE AND ENGINEERING

Biomedical Signal Processing is the science of acquiring, analysis and cognitive interpretation of signals generated by the living beings. These signals, like the electrical activity of the heart, Brain or muscles i.e. ECG, EEG and EMG respectively, carry pivot information about physiological states and potential diseases. With the ascent of digital health, wearable devices and AI, Biomedical signal processing has become one of the most electrifying and game changing realms in the fields of modern medicine.

## What are Biomedical Signals?

Biomedical Signals are time-varying measurements from living organisms. They are further classified into 4 major types i.e. mechanical (heart and blood pressure), electrical (EEG and EGC), chemical (blood sugar levels) and optical. Due to their intermittently weak, cluttered, and complex nature, they need tech heavy processing to decipher meaningful information.

## Signal Classification and Interpretation

With features in hand, the next challenge is interpretation. This often involves classification—determining if a signal pattern indicates normal or abnormal physiology. Machine learning and AI have revolutionized this step. Models can be trained to Identify patters of arrhythmias in ECG, epileptic seizures in EEG, or muscle fatigue in EMG.

Popular classification techniques include:

- Support Vector Machines
- Decision Trees
- Artificial Neural Networks
- Deep Learning

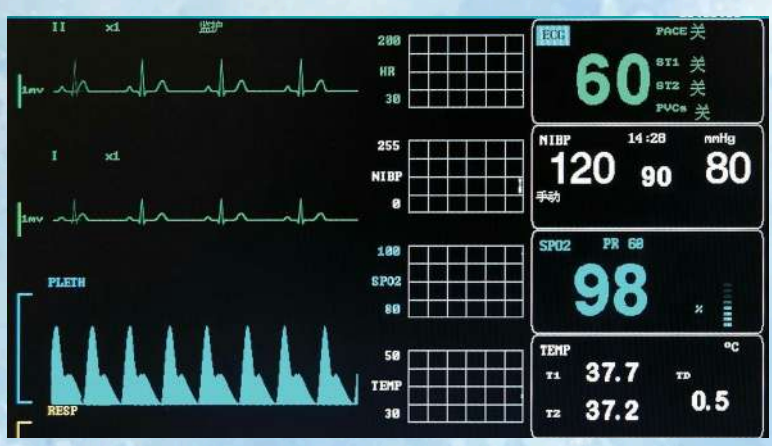
These methods can outperform traditional rule-based systems, especially with large datasets.

## Acquisition and Preprocessing

First and the foremost is signal acquisition, this is done using sensors and electrodes. For example, ECG electrodes on the chest acquests the signal sent by the heart. However, raw signals are rarely clean. They're contaminated by noise from muscle movement, power lines, or even the environment. Preprocessing involves filtering out this noise. Common techniques include:

- Low-pass filters to eliminate the high frequency noise
- High-pass filters to bypass the slow drifts
- Notch filters to remove power line interference (usually at 50 or 60 Hz)

Preprocessing makes it positive that the signal is ready for further scrutiny.



## Applications in Medicine

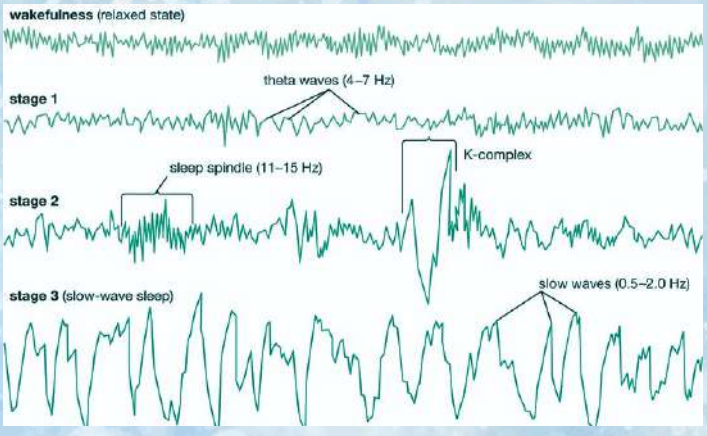
The uses of biomedical signal processing are spread across various domains:

- In cardiology it is used to recognize arrhythmias and heart attacks and to monitor pacemakers via the ECG.
- In neurology it can assist in the diagnosis of epilepsy and sleep disorders and in the evaluation of brain injuries through the EEG.
- In critical care it involves the continuous observation of vital signs in ICUs to provide early warning of vital sign deterioration.
- In telemedicine it has become crucial for remote monitoring and diagnosis during pandemics.

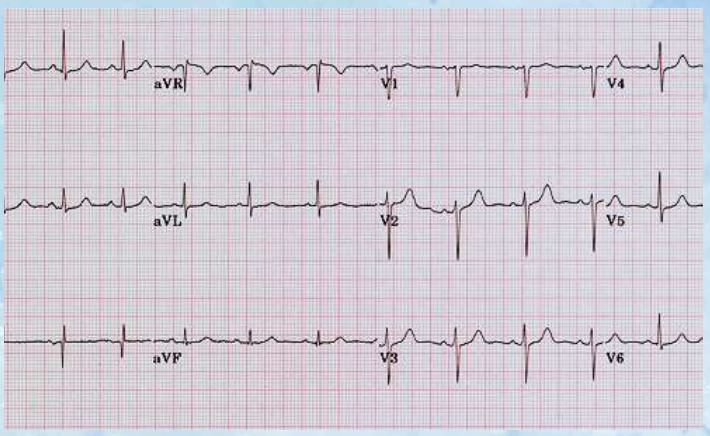
Everyday healthcare wearables like smartwatches and fitness trackers uses the inputs and insights concluded using signal processing systems to assess heart rate, blood oxygen levels, and physical activity. Even when this is very highly regarded in the industry, biomedical signal processing still has its own share of struggles that needs to be addressed

- Noise and Artifacts. Motion, poor electrode contact, and environmental interference can cause an error in measurement.
- Interpersonal Differences. Universal customized algorithms are difficult to design and implement because of variation in signals received from different individuals.
- Data Security. The management of sensitive health information is always an issue.

The future indeed seems optimistic. Enhanced AI, cloud technology, and sensors are the foundational stones of real-time, personalized, health monitoring technology. Picture a smartwatch that does not only count your steps, but also predicts your heart attack, and monitors the early signs of disabling neurological diseases.




EEG (electroencephalogram) - study of brain activity




ECG (electrocardiogram) - study of abnormalities of heart

## Conclusion

Biomedical signal processing is the invisible engine that makes modern healthcare technology work. It converts the raw signals from the body and the noise around the body. It communicates with healthcare providers and patients in real-time. Technology is making healthcare increasingly personalized, faster, and smarter. The art and science of biomedical signal processing powers the journey from a simple, yet vital, heartbeat to a life-saving diagnosis.

# WEARABLE HEALTH TECHNOLOGY

~ KOVIDA PUNJ, FY

## Wearable Tech

In the era of rising technology, industries and tech markets are trying their best to come up with products that not only benefit people but also indirectly revolutionize other industries. The healthcare industry has seen the biggest turnover. Gone are the days when traditional methods were used to diagnose people and detect symptoms, requiring visits to clinics and medical centers, covering distances, and spending money on check-ups that often returned normal results.

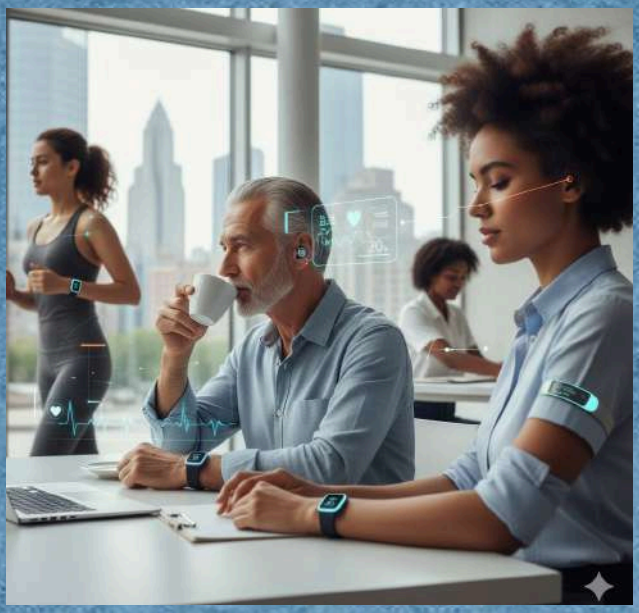
Nowadays, wearable technology dominates the healthcare market. These devices are compact, easy to use, portable, and sold at reasonable prices, prompting users to purchase and try them. So far, reviews have been positive as people feel benefited from them. They are slowly becoming part of everyday life.

These wearables are packed with a variety of features. Let's take the Apple Watch as an example:

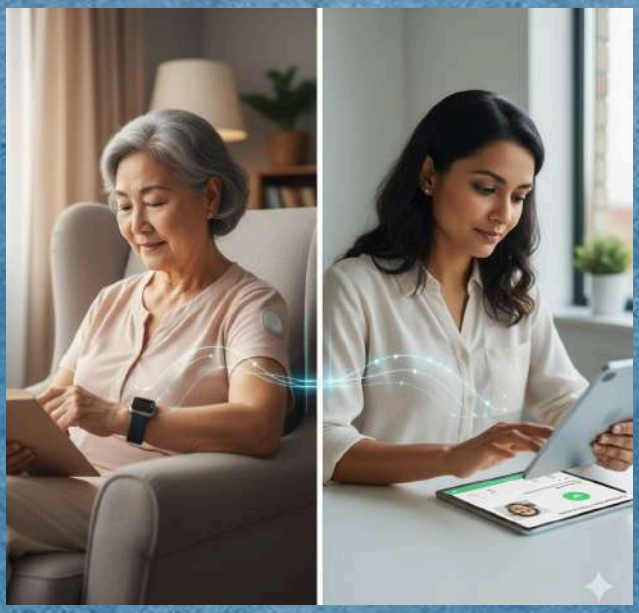
1. **Heart Rate Monitoring** – The back of the Apple Watch shines green LEDs (and sometimes infrared) into your skin. Blood absorbs light differently depending on blood flow. By measuring these tiny changes in reflected light, the watch calculates pulse rate. Continuous tracking allows it to notice irregularities like AFib. The sensor responsible for this is called a PPG sensor.
2. **ECG (Electrocardiogram)** – The watch uses electrodes built into the digital crown and back crystal. When you place your finger on the crown, a closed electrical circuit is formed across your arms and chest. This allows the watch to measure the electrical signals of your heart. The waveform is then analysed for abnormalities.
3. **Sleep Tracking** – Uses three sensors to detect motion, heart rate, and breathing patterns, based on which it compiles results. Machine learning is used to analyse patterns according to your daily sleep routine.
4. **Mindfulness and Mental Well-being** – Uses guided breathing exercises and heart rate variability (HRV), which is the variation in time between heartbeats, to track stress levels.
5. **Fitness and Activity Tracking** – Steps, direction, and speed of movement are detected by the accelerometer and gyroscope. Distance and elevation gain are tracked by GPS and the barometer. During workouts, heart rate combined with motion data estimates oxygen levels.
6. **Noise Tracking** – Uses the built-in microphone to constantly monitor ambient sound levels.

These features make the Apple Watch a powerful tool for managing health and wellness, providing users with valuable insights to monitor and improve certain aspects of health if necessary. Beyond personal use, wearables support preventive healthcare, provide data for doctors and researchers, and in some cases, have saved lives.

Let's dive into the case study of Sneha Sinha, whose life was saved by an Apple watch:
Sneha Sinha, a 35-year-old policy researcher from Delhi, experienced a sudden and persistent rapid heartbeat one evening. Initially attributing it to stress, she tried deep breathing exercises and drinking water, but the symptoms persisted.

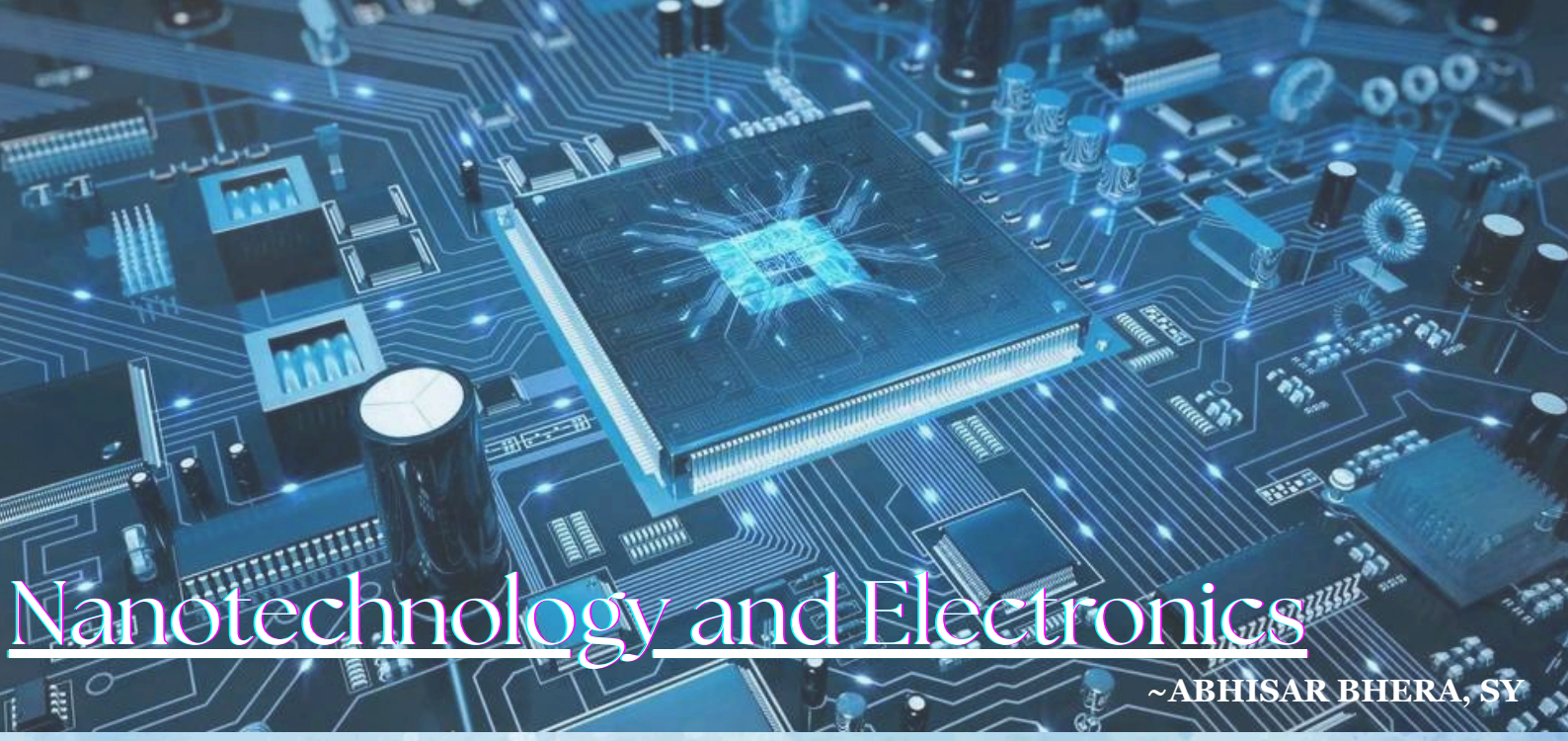


Concerned, Sneha decided to use her Apple Watch Series 7 to monitor her heart rate. The device's ECG feature detected an abnormal rhythm, potentially indicating the onset of atrial fibrillation (AFib), a condition that can lead to stroke if untreated. She sought immediate medical attention, and doctors confirmed the AFib diagnosis, commending her for timely intervention.



Evolving technology is also giving way to modern features like syncing with smartphones, cloud platforms, and health apps to provide personalized recommendations. These watches allow users to set goals for steps, hydration, or workouts, making health tracking more engaging. Sensors are becoming increasingly precise and accurate.

Wearables now come in the form of watches, rings, and wristbands, available in sleek designs and different shapes and sizes. Starting as fitness monitors, they have now become must-have lifestyle accessories. The consumer market for wearables is expected to continue expanding rapidly, blending technology seamlessly into everyday life.



# Nanotechnology and Electronics

~ABHISAR BHERA, SY

## The Limits of Silicon and Moore's Law

For more than fifty years, Moore's Law has been the guiding principle of the electronics industry. The idea that the number of transistors on a chip doubles every two years has given us smaller, faster, and cheaper devices. But today, that momentum is slowing down. As engineers shrink transistor sizes below 10 nanometers, they face the physical limits of silicon. At this tiny scale, strange quantum effects begin to appear. Electrons tunnel through barriers where they should not, leading to power leakage and unpredictable behavior. Meanwhile, the extreme heat produced by billions of tightly packed components makes cooling a critical problem. This material crisis is paired with an architectural one. The classic von Neumann architecture, where memory and processing are separate, forces constant movement of data back and forth. This creates what is known as the von Neumann bottleneck, which wastes enormous amounts of energy and slows performance. The problem is especially severe in areas like artificial intelligence, where computing demand is exploding. Silicon alone can no longer keep up.

## A New Material Toolkit

Unlike the silicon era, where one material ruled everything, nanoelectronics opens up an entirely new toolkit of materials. At the nanoscale, properties can be designed rather than accepted. Quantum mechanics, once a barrier, becomes an opportunity. Graphene, a single sheet of carbon atoms, is stronger than steel and conducts electricity better than copper. It holds promise for ultra-fast transistors and transparent, flexible devices. Carbon nanotubes, which are rolled-up sheets of graphene, can act as metals or semiconductors. Their unique properties could lead to circuits that are faster, smaller, and more energy-efficient than silicon. Quantum dots, tiny semiconductor crystals, can have their properties tuned simply by changing their size. This makes them ideal for displays and sensors, where color and energy efficiency are critical. Beyond these, a family of two-dimensional materials, such as transition metal dichalcogenides, offer natural bandgaps, making them excellent candidates for next-generation transistors. The ability to design materials at the atomic scale means researchers can build electronics that go far beyond silicon's limits.

## Applications Already Taking Shape

Nanoelectronics is already transforming technology in visible ways. Researchers are working with carbon nanotubes and two-dimensional materials to create faster, more efficient transistors, although challenges such as contact resistance remain. Data storage is undergoing a similar revolution, with nanoscale memories such as magnetoresistive RAM and resistive RAM promising faster, denser, and more energy-efficient storage. These could eventually blur the line between short-term and long-term memory in computers. Displays have already seen commercial success through quantum dots, which convert light with extreme precision to produce brighter, more colorful, and energy-saving screens. Meanwhile, flexible electronics are becoming a reality by printing nanomaterials onto bendable substrates. From health-monitoring patches to foldable screens, these advances are moving electronics beyond rigid boxes into fabrics, skins, and everyday environments.

## Architectures Beyond Silicon

Even more transformative are the new computing architectures that nanotechnology makes possible. Spintronics, for example, uses the spin of electrons rather than just their charge, offering a path to ultra-efficient data storage and processing. Neuromorphic computing takes inspiration from the human brain, combining memory and processing in the same place to eliminate the von Neumann bottleneck. Built with nanoscale devices such as memristors, these systems can handle pattern recognition and artificial intelligence tasks with remarkable energy efficiency. Wearable and conformable electronics made from nanomaterials are paving the way for smart fabrics, epidermal sensors, and bendable displays that blend seamlessly into our bodies and surroundings.

## Research Gaps

Despite its immense promise, the road to large-scale adoption is filled with challenges. Manufacturing at scale is one of the biggest hurdles. Making a single high-performance nanodevice in the lab is possible, but producing billions of them reliably and cheaply remains very difficult. For example, separating semiconducting carbon nanotubes from metallic ones is still a major challenge.

Another difficulty lies in integrating these new materials with existing semiconductor processes, where issues like contact resistance and material stability must be solved. Environmental and health concerns also demand urgent attention. Some promising nanomaterials, like cadmium-based quantum dots, are toxic.

Ensuring safety, recyclability, and sustainability is critical, and green nanotechnology that is focused on eco-friendly alternatives is still at an early stage of development.

## Conclusion: The Interdisciplinary Horizon

Nanoelectronics therefore represents not just a continuation of silicon's story, but a complete rethinking of how we build the digital world. Its progress depends on collaboration across disciplines such as materials science, physics, chemistry, biology, environmental science, and ethics. For students, it is a chance to enter a field at its most exciting stage, where basic research directly connects to real-world impact. For professors and researchers, it is a developing ground where scientific research meets industrial necessity. And for society, it offers both promise and responsibility: smarter, faster, and more sustainable electronics, balanced with ethical care and environmental awareness. Nanoelectronics is the frontier where science, technology, and society converge, and the next generation has the opportunity to define it.

# DIGITAL TWINS IN HEALTHCARE :
# A Virtual revolution in Medicine & Healthcare

~ APOORBA CHATTERJEE, FY

**Preface**

What if doctors could see the future of our health? Imagine a virtual version of your heart, lungs, or even your entire body stored inside a computer, updating itself with every heartbeat, scan, and test result for future medical use. Before prescribing a medicine or performing surgery, doctors could test it on your digital counterpart first safe, risk-free, and precise making sure that any further procedure is conducted successfully.

This futuristic idea is no longer a Science Fiction Tech. Originally developed in aerospace and industrial engineering, where engineers built digital replicas of engines and machines and parts of high end and large and small vehicles and gadgets to predict failures, digital twins are now making their way into medicine. By creating detailed, continuously updated models of patients and hospitals, they are set to revolutionize the way diseases are managed, treatments are planned, and healthcare systems are run.


In healthcare, digital twins can take many forms:

- Organ Twins – Digital versions of the heart, brain, or lungs, allowing doctors to study conditions and test therapies on the digital copy.
- Patient Twins – Whole-body models that simulate an individual's health and likely responses to treatment.
- Hospital Twins – Replicas of healthcare facilities used to streamline patient flow, staffing, and resources.

Because they are continuously updated, these twins act like living systems in the digital world, providing deep insights and predictive power.

**What Are Digital Twins?**

A digital twin is far more than just being a static 3D model. It is a dynamic, data-driven replica that mirrors a real-world system in real time. As new information streams in from medical imaging, wearable devices, sensors, genomics, and health records, the twin evolves and becomes a highly accurate reflection of the real entity, basically creating an exact copy of the human body in the form of a 3D digital replica

**Benefits of Digital Twins**

Digital twins bring many opportunities to healthcare, such as:

Personalized Care: Treatments tailored to individual biological needs and lifestyle.

Risk Reduction: Safer testing of medicines and procedures in virtual form first so the physical form is well prepared.

Predictive Insights: Detecting health risks before they become emergencies.

Cost Savings: Faster drug discovery and more efficient hospital operations.

Better Training: Safe, realistic simulations for medical education.

## Applications in Healthcare

The impact of digital twins is already being felt in several areas of medicine. In personalized medicine, doctors can test therapies on a patient's digital twin before prescribing them. In cancer treatment, for example, different combinations of chemotherapy or immunotherapy can be trialled virtually to identify the most effective plan with minimal side effects benefitting both for trialled Research and public usage.

They are also transforming surgical planning and training. Surgeons can rehearse complex operations on digital organs to anticipate risks and refine their strategies and instantly understanding where they may be going wrong. Medical students and young doctors gain safe, realistic training environments without putting any patients at risk.

For chronic diseases such as diabetes or heart failure, digital twins can simulate disease progression and predict complications. This enables doctors to intervene early and adjust treatment plans before major crises occur.

In drug discovery, virtual patient simulations speed up the development process, reducing reliance on lengthy and costly clinical trials. Thousands of scenarios can be tested rapidly, saving both time and resources and help in keeping patients safe.

Even at the system level, hospital management benefits from twins that can simulate admissions, predict ICU capacity, and optimize staff allocation, improving efficiency and ensuring resources are available when needed most.

## Current Developments

Several major organizations and research groups are leading the way:

Dassault Systèmes' Living Heart Project has created detailed heart models for research, surgery planning, and medical training.

Siemens Healthineers is developing patient-specific heart twins to predict and treat cardiovascular conditions.

Philips Healthcare is building ICU twins to improve patient management and resource planning.

The BedreFlyt Project (2025) applies digital twins to improve patient flow and bed allocation in hospitals.

The NHS & Imperial College London are piloting digital heart twins for patients with pulmonary arterial hypertension, combining imaging and wearable data.

Tata Consultancy Services (TCS) showcased its "Digital Twin Heart" technology at the 2025 Sydney Marathon, monitoring athletes' cardiovascular performance.

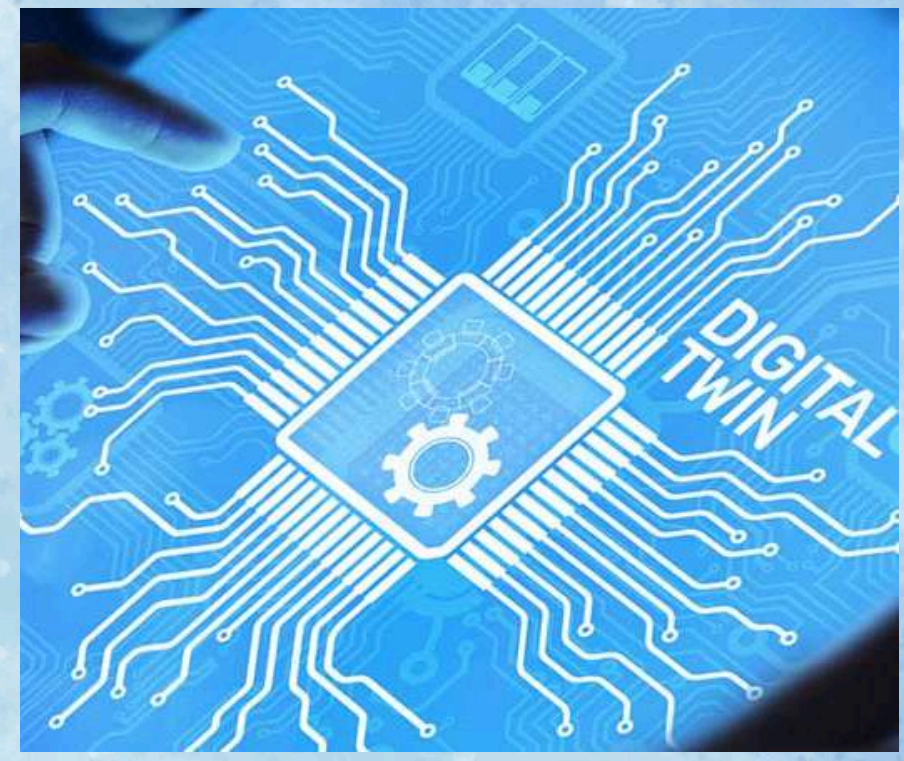
HEALWELL AI's VeroSource Solutions has added digital twin features for hospital management, enabling administrators to optimize staff and layouts.

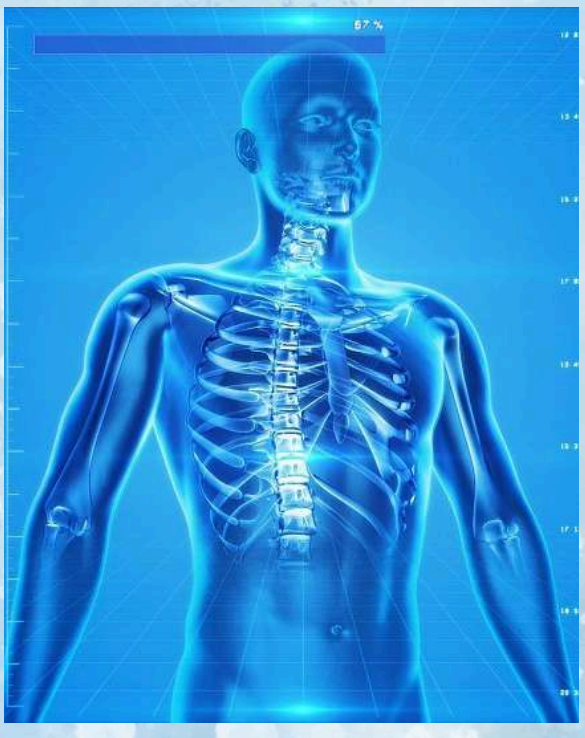
Research into Oncology Digital Twin Ecosystems aims to integrate patient histories and clinical pathways to personalize cancer care.

These examples highlight how both pioneering companies and newer initiatives are shaping the future of digital healthcare.

## Challenges and Limitations

Despite their promise, several challenges remain. Medical data is extremely sensitive, and protecting it against hacking or misuse is a necessity. Hospitals also use diverse systems, making it difficult to integrate data into a whole. Running real-time simulations requires advanced AI and powerful computing infrastructure, which can be pricey. Ethical questions are equally important such as: Till how much should doctors rely on digital simulations when making life-or-death decisions, and who ultimately owns a patient's digital twin, either the individual themself or the hospital, or the technology provider?



## The Road Ahead

Looking ahead, digital twins are expected to play an even larger role in healthcare . Experts predict that by 2035, individuals may have their own lifelong digital twin, updated continuously from birth to old age. These twins could guide everyday decisions about lifestyle and diet while supporting major medical interventions such as surgery or genetic therapy.

Advances in artificial intelligence, cloud computing, the Internet of Things, and genomics will make digital twins more accurate and widely available. Hospitals may rely on them to predict epidemics, governments to plan health policies, and patients to monitor their own health in real time. The ultimate goal is a shift from reactive medicine—treating illnesses after they occur to predictive and preventive care, where problems are anticipated and prevented before they escalate.

## Conclusion

Digital twins represent a powerful convergence of electronics, communication, and computing within healthcare. They have the potential to transform diagnosis, treatment, hospital operations, and drug development, creating a safer, smarter, and more personalized healthcare system.

For the ENTC community, this is an inspiring example of how engineering intersects with medicine. The sensors, circuits, and algorithms we design today could one day form the backbone of tomorrow's healthcare breakthroughs. As digital and biological worlds come together, digital twins are not just glimpses of the future, but pathways to a healthier and more connected tomorrow benefitting the human race.

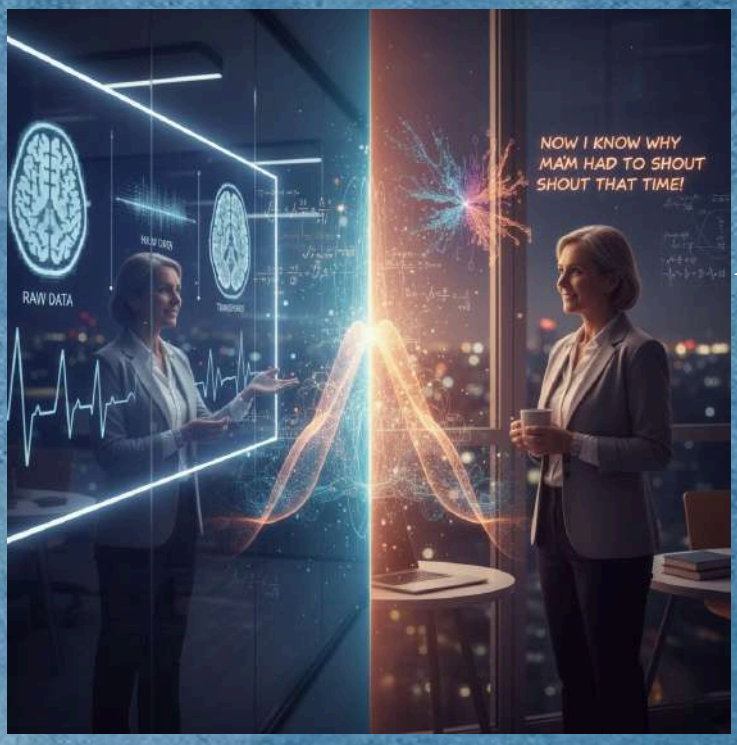
# TRANSFORMATION

Laplace, Fourier, Z and wavelet transform,
All dance on my smart board — crisp and warm.
Signals and systems, domains and decay,
I try to make sense in my own steady way.

Some students listen, eyes wide and bright,
Some scroll their phones — oh, what a sight!
A gentle warning, then a sharper tone,
"Hand me that phone — be a bit alone!"

Somewhere a whisper, a giggle, a hum,
A background noise that won't stay numb.
I breathe, I pause, I give that stare,
And suddenly — silence fills the air.

In tutorials, though, the scene's divine,
Pens are moving, answers align.
But lectures? Ah, it's a different play,
Where attention keeps fading away.


One day they'll filter images bright,
Or clean noisy signals late at night.
And maybe then, with a smile so sublime,
They'll say, "Now I know why Ma'am had to shout that time!"

A dive in mathematics and abstract thought,
Builds patience and character that world forgot
Each derivation, each interpretation,
Shapes a new world of imagination.

Right now I'm processing them, you see,
Their signals, ideas, and energy.
In teaching transforms, strange but true —
I'm transforming a little bit too.

**By: Dr. Pratiksha Bhavsar (Faculty)**

# INDUCTION PROGRAMME (AUGUST 2025)

The air on campus was buzzing with a palpable energy as we recently welcomed the newest cohort of students to our college. The induction ceremony of the students of the Class of 2025–29 inaugurated an exciting and transformative experience for these young minds. It was not only a formal welcome, but the ceremony was an experiential introduction of sorts, into the rich academic and social experience that lies ahead of them.

Induction programme was carefully planned to ensure each new student felt welcomed, well-informed, and motivated. It started off with an opening talk by Dr. Pritesh. Shah, Head of Department, Electronics & Telecommunication Engineering, whose words of experience and motivation provided a strong pointer towards the days ahead. Students were also introduced to faculty members and staff who will be guiding them throughout their academic journey here at SIT. Formal introductions were excellently supplemented with fun ice-breaker programmes, wherein the room rang with laughter and conversations wherein students overcame their first-day jitters and forged the first of many bonds of friendship.

The program was not limited to academics alone—it was also a gateway to campus life. A dedicated campus tour introduced the freshers to the vibrant world of societies, sports teams, and clubs that make our college a thriving community. Whether it was academics, technical clubs, central clubs or the events, each part offered the first years a glimpse of the countless avenues waiting to be explored. The students ended the day with a sense of belonging and excitement for the days to come.

What followed was an enriching fifteen-day journey that seamlessly wove together industry insights, alumni wisdom, and student camaraderie. On 11th August, the students had the privilege of attending two remarkable industry expert sessions. Mr. Vinay Sharma spoke about VLSI, introducing the vast world of semiconductor design and its critical role in shaping the future of technology. His session was followed by Dr. Febina C, who shed light on Automotive Technologies and how innovation and electronics are revolutionizing the way we think about mobility.

12th August was dedicated to our alumni and seniors. alumni from diverse walks of Life returned and offered stories which were pragmatic and equally inspiring. From professional tips and first-hand experiences, these sessions bridged aspiration and reality. Towards the end, junior–senior interaction was done in a memorable and spiritedfashion. Games, talks, and laughter filled the air and created bonds, which Would remain over the years.


On 13th August, the focus shifted back to industry learning with a thought-provoking session by Mr. Bharat Shivaji Kokate on Embedded Systems. His talk highlighted how embedded technologies power the world around us, from the tiniest devices to large-scale systems, making students appreciate the vast applications of their chosen field.

The subsequent days were no less varied and interactive. Technical workshops enhanced students' exposure to their field, while personality development, career creation, and communications imparted skills outside the classroom. Cultural events exhibited the creative spirit of the college, demonstrating that life here is equally about self-expression and studies. From mental stimulus to artistic celebration, the programme was equally balanced.

After the induction was over, the students had been through so much more than an orientation. They had entered a community of growth, of teamwork, of innovation. They had listened to experts, joked around with students, connected with guides, and dreamt of their own futures ahead. Above all, they had lost the fears of being "new" and gained the assurance of belonging. Those fifteen days of induction were no formalities, but a celebration of new experiences. They blended knowledge and inspiration, discipline and enthusiasm, and tradition and innovation. As the Class of 2025–29 embarks now on its earning journey, it does so under the promise of learning, discovery, and memories for a lifetime.

# INDUSTRY VISIT

On 16th September 2025, second-year students from the Department of Electronics and Telecommunication at Symbiosis Institute of Technology, Pune, visited Otter Controls India Pvt. Ltd. (OCI) in Chakan, Pune, as part of their industry exposure program. The visit was organized in two batches and accompanied by faculty members Dr. Chandan Kumar Choubey, Mrs. Arati Mulye, Dr. Kunal Shejul, and Mr. Atul More. The main aim was to give students practical insight into industrial processes and to connect classroom learning with real-world applications. Students were welcomed by Ms. Tejashree Suryawanshi, HR Manager, who introduced them to the company protocols before the tour.


Otter Controls India Pvt. Ltd. is an Indo-British joint venture specializing in high-precision engineering products. Established in 2018, the company manufactures a wide range of components, including electrical connectors, cutouts, VP2 connectors, various wiring harnesses, sensors, and Liquid Silicone Rubber (LSR) products. These components serve both automotive and non-automotive sectors, reflecting the company's focus on quality, precision, and advanced production technologies.

During the visit, students toured four production plants. In the connectors and cutouts plant, they observed precision molding and assembly processes. In the sensors and LSR plant, they saw advanced injection molding using Arburg machines and Nexus dosing systems to produce gaskets, seals, and specialty O-rings. The role of automation in improving production efficiency and maintaining consistent quality was also highlighted throughout the tour

Students gained a clear understanding of the company's quality control measures. OCI holds ISO 9001:2015 and ISO 14001:2015 certifications and operates a clean room facility (ISO 8/Class 100,000) for sensitive manufacturing processes. Advanced tooling in the toolroom, including wire-cut EDM and VMC machines, demonstrated how precision components are produced to meet strict industry standards.

The students were also introduced to OCI's diverse product portfolio, including automotive brush housings, coil windings, precision molded parts, wiring harnesses, VP2 connectors, and LSR components like gaskets and seals. Seeing how material science, automation, and precision engineering come together gave students practical insight into the industrial applications of electronics and telecommunication concepts

Overall, the visit was highly enriching, providing hands-on exposure to real-world industrial operations and bridging the gap between theory and practice. The students expressed their gratitude to Otter Controls India Pvt. Ltd. for their warm welcome and guidance, and to the faculty for organising the visit. Experiences like these are invaluable in preparing students for future professional challenges.



SYMBITECH

This year, SymbiTech 2025 once again brought the spirit of innovation and collaboration to life at SIT. The campus was charged and filled with energy as students from every corner of the institute came together to explore, compete, and create. The fest celebrated the power of technology and imagination offering a platform where ideas met execution and learning blended effortlessly with fun.
The Department of Electronics and Telecommunication (ENTC) played a role in this celebration with a vibrant range of events that combined technical expertise, creativity, and teamwork. The department's flagship clubs the Electronics Design Club (EDC) and the IEEE Student Chapter and the NGCC Club led the way with activities that truly embodied the essence of engineering inn

**IEEE Student Chapter**

SignalScape (IEEE):

The IEEE Student Chapter took a more research-driven route with SignalScape, a project-based event focused on the theme of Signals and Systems. The event provided a platform for students to present their academic projects in front of an expert panel of faculty and industry professionals.

A total of seventeen topics were assigned, with two groups working on each one from Section A and another from Section B. Each team had eight minutes to present followed by a two-minute question round that often evolved into deeper discussions and cross-questioning sessions.

The competition encouraged participants to think critically, defend their ideas, and explore the practical relevance of theoretical concepts. The judges evaluated teams based on creativity, technical understanding, and clarity of explanation. Three teams emerged as winners, but every participant gained valuable exposure to real-world communication and presentation skills.
SignalScape successfully blended academia with innovation turning the classroom subject of signals into a lively exchange of ideas and exploration.


## Electronics Design Club (EDC)

### Circuit Carnival (EDC):

The Electronics Design Club transformed the EM and Digital Electronics Labs into a space brimming with creativity and curiosity through its flagship event, Circuit Carnival. The two-day event was designed to make learning fun by combining problem-solving and teamwork with a touch of playfulness and excitement.

The carnival featured six distinctive events consisting of Component Tambola, Wired Wonders, Skibidi Scramble, Watt's Your Move, Electro Escape, and Treasure Track. Each activity tested a different blend of technical knowledge, logic, and creativity.

- **COMPONENT TAMBOLA**

This event was a modified version of the classic tambola game, where numbers were replaced with electronic components. Participants had to recognize and mark the correct parts as they were announced. It helped students revise their knowledge of components and improve recognition skills. By blending fun with academics, it reinforced basic electronic concepts in an enjoyable format.

- **WATT'S YOUR MOVE**

This activity was an electronics-themed version of charades. Participants acted out technical terms while teammates tried to guess. It fostered creativity, teamwork, and lateral thinking, while also helping students remember technical vocabulary in a fun, unconventional way.

- **ELECTRO ESCAPE**

A highlight of the day, this event combined physical activity with technical puzzles. Participants first had to throw balls to topple a cup tower, where hidden clues were placed. These clues were written in binary numbers, which then had to be decoded into decimal values to open a lock. The event developed both mind–body coordination and logical reasoning. It was particularly helpful in strengthening binary–decimal conversion skills, while also testing focus, and patience under time constraints.

- **SKIBIDI SCRAMBLE**

This was a rapid-fire event based on meme riddles, designed to test presence of mind and quick thinking. Although non-technical, it boosted participants' communication skills, creativity, and decision-making under pressure. It also added humor and relaxation, making the overall experience more lively.

- **TREASURE TRACK**

Treasure Track sent participants racing through the lab on a riddle hunt that demanded creativity and quick thinking.

- **WIRED WONDERS**

In this task, participants used a breadboard piano to replicate specific sound patterns. It tested their ability to make precise connections and understand circuit behavior. The event enhanced hands-on skills with breadboards, encouraged logical sequencing, and built confidence in handling simple electronic setups. Skibidi Scramble added humor and speed with meme riddles that tested presence of mind.

**Next Generation Communication Club (NGCC)**

The Next Generation Communication Club (NGCC) organized two engaging events that combined creativity, technology, and communication skills.

**The Signal Circuit Challenge:**

A multi-round technical competition that tested participants' knowledge of communication concepts in fun ways. The rounds included decoding messages using Morse code and walkie-talkies, a surprise "Spin the Wheel" task with team challenges, and a final VR racing game that blended quick thinking with modern technology.

**Ham Radio Talk and Hands-on Experience:**

A practical session led by a licensed Ham Radio expert, where students explored real radio communication equipment. Participants operated HF and VHF/UHF transceivers and learned about antenna systems, gaining valuable hands-on exposure to real-world communication tools.

**Conclusion**

From the excitement of Circuit Carnival to the intellectual depth of SignalScape, SymbiTech 2025 proved to be a celebration of creativity, collaboration, and continuous learning. The ENTC department once again showcased how innovation thrives where theory meets practice and where engineers dare to turn imagination into reality.


REVERB

Reverb, the cultural fest of Symbiosis Institute of Technology, was a two-day event that brought immense excitement to the campus. The event featured a wide range of games and fun activities that kept participants engaged throughout the day, ending each day with DJ Night.
The atmosphere buzzed with enthusiasm as students celebrated creativity, teamwork, and campus spirit.


The event consisted of the following games

**Time glitch:**
Time Glitch was an engaging and immersive experience that combined creativity, teamwork, and problem-solving. The escape room was designed with intricate details, from dim lighting and background music to strategically placed clues that sparked a sense of mystery. Each puzzle required careful observation and logical thinking, pushing participants to collaborate and think under pressure.

**Where's the Exit:**
Where's the Exit was an exciting and mind-teasing game that kept participants on their toes. The challenge involved solving a series of riddles and following clues to find hidden rewards. Each clue led to another twist, making the game both fun and unpredictable.
**JAMboree:**

It gave students the chance to pick their favorite songs, grab the mic, and sing their hearts out. JAMboree gave students the chance to unwind, enjoy music, and create fun memories with classmates and friends

**The Royal Reel :**
The Royal Reel offered participants an interactive adventure filled with riddles, clues, and mystery. The game encouraged players to think critically and observe closely as they moved from one challenge to the next. Each clue uncovered a new part of the story, The Royal Reel combined teamwork, curiosity, and problem-solving

**JALWAA :**
In this event, Students competed for the titles of Mr. and Ms. SIT. Participants went through a series of fun and challenging rounds that tested their confidence, creativity, and stage presence


**The Voice Solo Singing Competition:**
The Voice solo singing competition gave students a platform to share their passion for music and connect with the crowd.

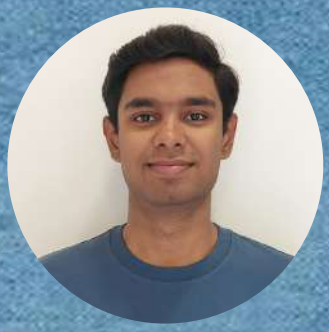
**Solo Surge :**
Solo Surge invited dancers to take the spotlight and express themselves through dynamic solo performances. Allowing students to use their creativity and confidence to the best of their capability

**Rifforia :**
Rifforia brought together talented bands from across the institute, each eager to deliver their best performance. The competition was intense, with every group showcasing powerful music, energetic stage presence, and impressive teamwork.

**Mehfil-e-Alfaaz :**
A literary event celebrating the art of storytelling and poetry, fostering creative expression and meaningful engagement, allowing students to impress and reflect themselves.

# THE TEAM

**Labdhi Mandovara, TY**
Team Head



**Gaurish Malhotra, TY**
Team Co-Head

**Dr. Pritesh Shah**
Head, Department of Electronics and Telecommunication
Senior Member, IEEE

**Jiya Palod, TY**
Design Head

**Nandini Bansal, TY**
Content Head

**Divyansh Rastogi, TY**
Photography Head

**Dr. Aditya Jain**
Faculty In-Charge

**Ananya Patni, TY**
Associate Editor

**Avishi Poddar, SY**
Design Co-Head

**Mantavya Anand, SY**
Content Co-Head

# THE TEAM

**Ananya Swadia, SY**
Design

**Jasnoor Kaur, SY**
Design

**Abhisar Behra, SY**
Content

**Apoorba Chatterjee, FY**
Content

**Asit Srivastava, FY**
Design

**Kovida Punj, FY**
Content