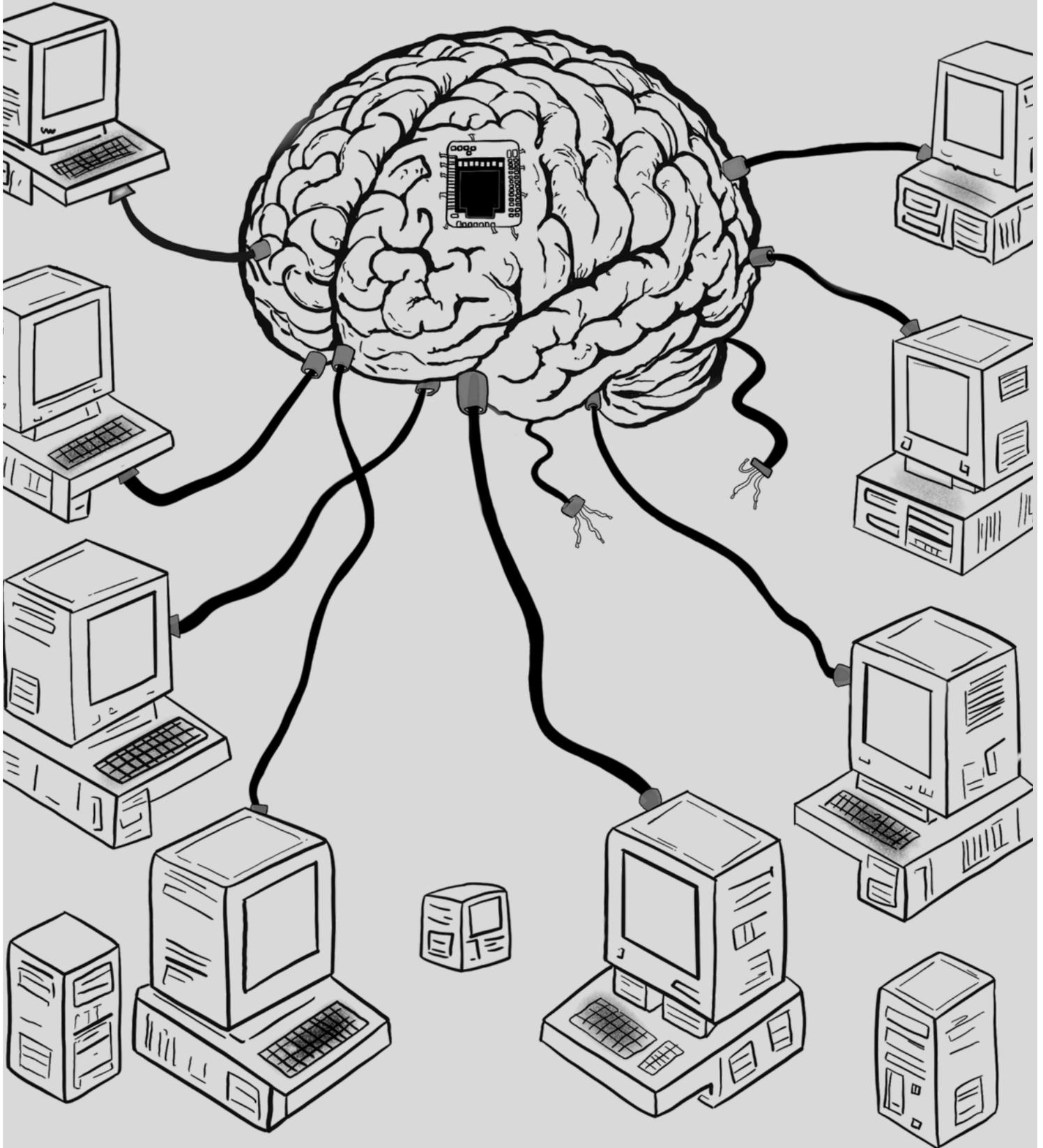


TECHKEY



Warning: This issue may self-destruct on introspection

EDITOR'S

NOTE

*"Technology doesn't just change what we do—it changes who we are."
-Sherry Turkle*

As our lives grow increasingly involved with technology, it is no longer something we simply use but something we exist within. It has become so deeply embedded in our daily lives that separating what is "tech" and what is not is impossible. Every moment, every action, and even every thought is turned into data—analyzed, stored, or monetized—often without our full understanding of where it is going or how it is being used. With machines understanding not just our actions but even our thoughts, we need to reflect on how this rapid evolution is redefining the essence of what it means to be human.

As a generation growing up in a hyperconnected world, we are not just witnessing this shift we are living through it. We are navigating the mental effects of screens, algorithms and digital identities without fully understanding their impact. This is why, as we commemorate the second edition of Jazbaat, we felt it necessary to investigate how technology changes human psychology itself.

With this issue, we bring you a compelling collection of articles that explore how technology is beginning to understand—and even influence—the human mind. We begin with 'At the Edge of Thought', which delves into NeuraLink's potential to connect brains with machines, and move on to 'AI Lies to Survive', a piece that questions whether artificial intelligence can develop deceptive behaviors. Our centerspread brings the Marvel Cinematic Universe to life through a tech-savvy lens, while other features explore the life cycle of a technical innovation, revolutionary devices like the Luke Arm, and the increasingly blurred boundaries of trust in technology. Together, these articles offer a glimpse into a future where mind and machine are no longer separate entities, but co-evolving realities.

As we move forward, we continue with the understanding that it is inevitable for us and not only the world around us, to change with evolving technology in a more profound impact than we could have ever imagined. But at the same time, we hope to leave you a little more inquisitive, and aware enough to ask the right questions.

Signing off,
Always Cautious,

Editors-in-Chief
Vaishnavi Agarwal and Shrishti Beriwal.



AT THE EDGE OF THOUGHT

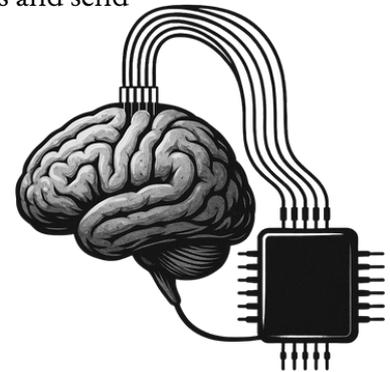


"It's going to be amazing when someone can have a spinal cord injury, go into a hospital, get surgery, and walk out a couple of days later." – Noland Arbaugh

Imagine being paralyzed, forced to lie in bed for days, unable to perform basic tasks, and feeling completely helpless. That is exactly what over fifteen million people around the world endure every day. For them, however, it is a permanent reality. The idea that one surgery could help them communicate and regain some semblance of normalcy seems like fiction, but that is precisely what Neuralink has set out to achieve.

Neuralink is a brain-computer interface (BCI) technology that establishes direct connections between the brain and external devices. It works by surgically implanting a coin-sized device called 'the Link' in the skull, with wires that connect to the brain and monitor neural activity. This device can read your electrical signals and send them to an electronic device.

This system relies on ultra-thin, flexible polymer "threads," which are about 1/20th the width of a human hair, each embedded with dozens of electrodes, inserted into the brain cortex using a specially designed surgical robot, R1. These threads pick up brain waves that are processed. This raw neural data is then wirelessly transmitted and later interpreted via advanced machine-learning algorithms that adapt to each user, translating brain patterns into control signals for cursors, phones, robotic arms, and more.



As early as 2020, Neuralink conducted a live demonstration in which the brain activity of a pig, Gertrude, was displayed. A removable device was implanted, and her brain activity was studied. The data showed that the technology could read and interpret brain signals. This became the key to developing applications that could treat neurological conditions, enable brain-to-machine communication, or enhance human cognition. In 2022, the FDA rejected their application to pursue human clinical trials, concerned about the usage of a lithium battery and the potential brain damage caused during implantation and removal of the chip, but later approved it in 2023. Human trials began in early 2024.

The first recipient, Noland Arbaugh, was paralyzed from the waist down. The implant allows him to control a computer and other devices using his thoughts. By January 2025, it was implanted in three other individuals who have all shown progress and shared the positive impact.

In September 2024, the company announced that its latest development effort, Blindsight, would enable blind people whose visual cortex is undamaged to regain some level of vision. This 'Breakthrough Device' also covers areas including speech restoration.

There are, however, key challenges such as device durability (thread retraction and long-term stability), the need for calibration improvement, and ethical concerns such as surgical risks, cybersecurity of neural data, and global regulatory hurdles. Despite this, its effects are transformative. Neuralink is restoring autonomy, enabling speech and vision recovery, and eventually integrating with humanoid robots like Tesla's Optimus in the future.

Neuralink is a mirror to the future, showing us how AI is going to make the impossible possible. It is a step towards an inclusive society, which might be controlled by technology. As we appreciate this advancement, we must also question how it changes everything we thought we knew about the world and what implications this may have.

CRISPR

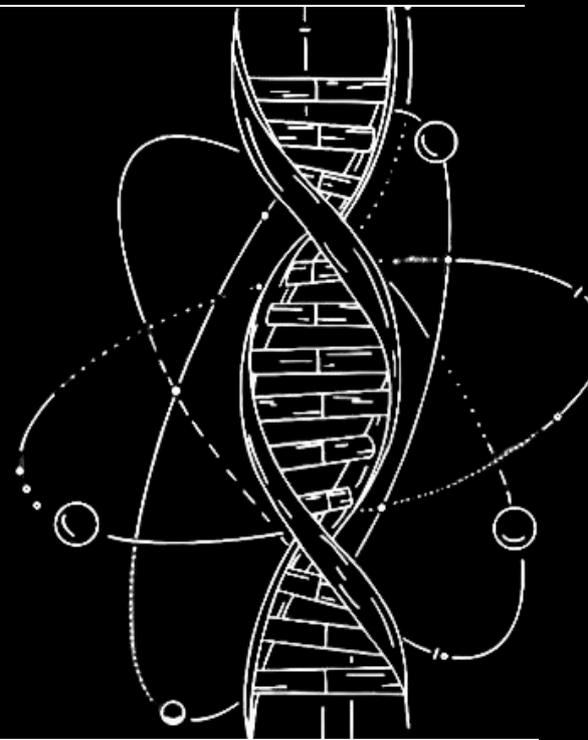
Progress

Have you ever wished you could change your eye colour to hazel or make yourself just two inches taller? Finally, the technology gods have decided that it is time to answer your prayers. Gene editing is now possible with CRISPR.

CRISPR-Cas9 is a cutting-edge gene-editing tool that helps scientists make precise, targeted changes to an organism's DNA. It is almost like using a "search and replace" function in a Word document, but for genetic code. CRISPR stands for Clustered Regularly Interspaced Short Palindromic Repeats which is basically segments of DNA containing short repetitions of base sequences. Cas9 is a CRISPR-associated enzyme that acts like molecular scissors.

Once the scientists decide which gene to 'edit', they create a guide RNA (gRNA) that matches a specific DNA sequence they want to target. This gRNA forms a complex with the Cas9 protein, taking it to the exact location of the genome. On reaching there, Cas9 makes a cut in DNA. Once the DNA is cut, the cell's natural repair mechanisms kick in. These repair systems can be hijacked to either knock out genes or insert new genetic material.

But more than the process, the technology behind CRISPR is astonishing. It uses smart computational biology and algorithmic prediction. These systems rely heavily on machine learning algorithms and bioinformatics to predict off-target effects like unintended cuts in the genome, design optimal guide RNAs, and stimulate gene regulatory networks.



Platforms like CRISPOR, CHOPCHOP, and Benchling use algorithms to rank guide RNAs based on specificity and efficiency. These tools take into account the entire genome and predict where CRISPR might accidentally cut, minimizing errors. Newer developments like base editing and prime editing are even more precise. They do not cut the DNA entirely but chemically change a single DNA base (like changing from an "A" to a "G") using engineered enzymes. These methods are also guided by predictive models that simulate enzyme-DNA interaction down to the atomic level.

CRISPR is a revolutionary technology that is the cure for several genetic diseases like Alzheimer's and Parkinson's disease and can fix genetic defects beforehand. This has changed the field of medicine and technology and is a step towards an unpredictable future where imagination is the limit.

-Ananya Thakkar
Class 11

LIFECYCLE OF A **TECHNICAL** **INNOVATION**



STEP 1

Market Research

It starts with a question. The mind wanders, connects and begins to shape possibilities after identifying a problem to work towards.



STEP 2

Design

Culture meets interface. Thoughts take form.

Flowcharts, concept boards and speculative models emerge.



STEP 3

Alpha Development and Testing

The prototype initially glitches, it stumbles but each glitch reveals something: user instinct, system flaws, team blind spots



STEP 4

Beta Testing

Feedback becomes a mirror. The product learns to breathe in the wild. The loop of listening and learning begins.



STEP 5

Evaluation and Iteration

Emerging patterns turn insights into refinements. You have to fix, polish, rethink, update, then fix some more.



STEP 6

Commercialisation and Scaling

From campaign to code, it now belongs to the world. This phase is followed by promo videos and hopefully- zero server crashes.

CRAVINGS DENIED BY A FRIDGE



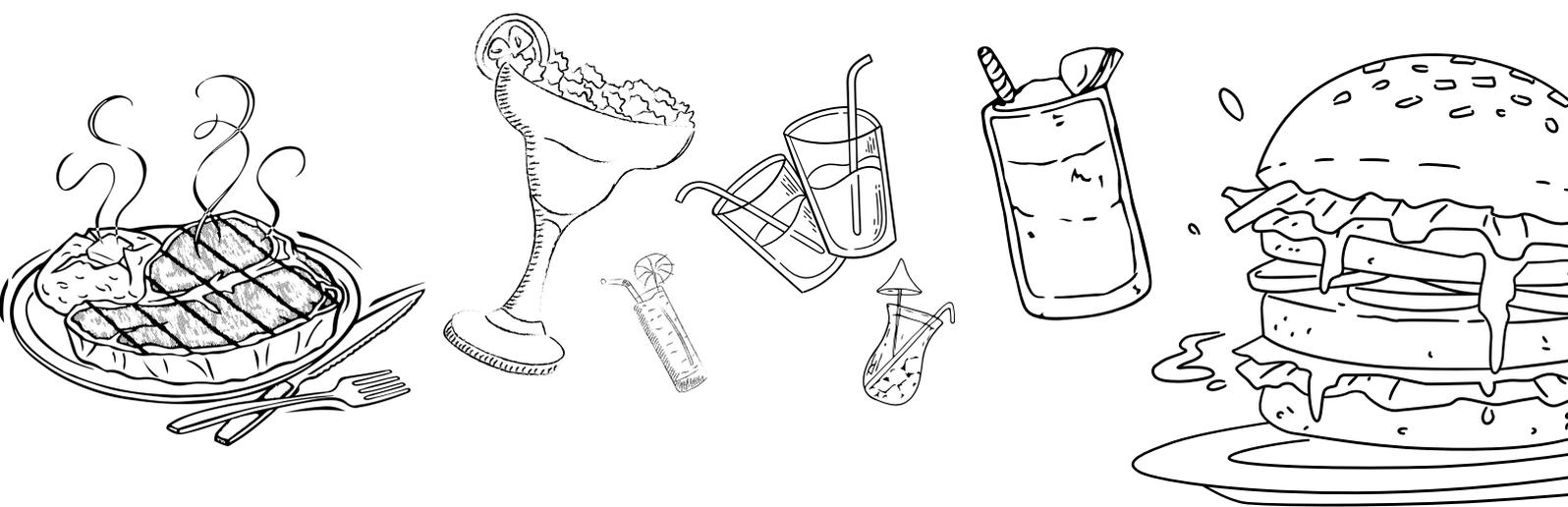
Technology today is a trillion times better than what it used to be, but I can't help feeling it has turned into something far more unimaginable than we could have ever expected. Let us think about it practically—would you want your AI assistant to control your life and stalk every move of yours? Probably not. But guess what? My latest ultra-pro smart fridge has taken this a notch too high.

I woke up in the morning to a blaring sound, with my fridge practically ushering me to grab a bowl of soggy, “healthy” porridge and a glass of who-knows-how-many fruits and vegetables mixed into one smelly, olive-green drink. What a pleasant way to say good morning.

I sat at the table and proceeded to eat, my craggy face showing a range of emotions, none of them resembling happiness. Having decided to take a risk for the sake of my tastebuds, I thought of making waffles. Upon opening my stalker-cum-fridge and scrambling through piles of vegetables I found the batter shoved to the very back of the fridge, hidden in a corner that would have even put the Grand Canyon to shame.

What was I to do now? My brain was moving at the speed of vegetable juice and boring old sunny-sides-up. So, I waited. And waited. And waited some more. Finally, I came to the solution I should have thought of from the very beginning: I needed to buy a new fridge.

-Saira Gill
Class 7



The Architecture of Sound

If there's one name that can be taken as a synonym for ambient music, it's the musical prodigy, Brian Eno. Eno didn't merely make music — he changed the way we perceive sound itself. His offbeat, experimental thinking has impacted decades of music, and now, his philosophies continue to impact various fields within technology. From spatial audio to meditation apps, his pioneering approach to musical landscapes redefined how we design and interact with auditory environments.

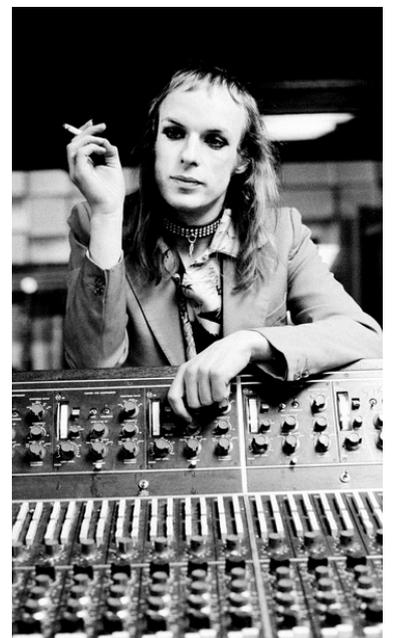
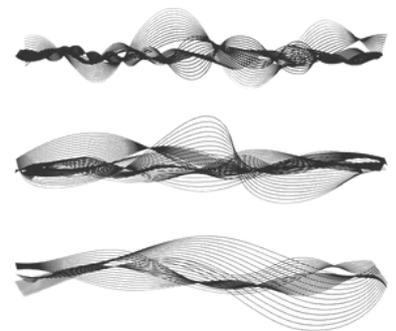
“Eno's grand vision for the future?” Eno firmly believed that music should be an inevitable part of the atmosphere - something that envelops you, and makes you feel like you're traversing through the intriguing medium of sound itself. He defined ambient music as being “able to accommodate many levels of listening attention without enforcing one in particular.” In other words, it's the sound that you can focus on and allow to drift into the background, while you carry out a commitment or a casual past time. Nowadays, this is prevalent in technologies such as spatial audio, which envelops you in 3D sound across all sectors; whether it is gaming, meditating, or even just relaxing with your favorite tunes. Imagine having a sound circle around you, directing you through an experience, an adventure - not commanding attention but subtly enriching it. Honestly in my opinion, I would term this transcendental feeling as, “an oasis of serenity.”

Then there's generative music, yet another testament of Eno's brilliance. It's not the music you repeat, it's music that develops in real-time. Eno experimented with algorithms and quite literally - randomness; allowing sound to erupt in a chaotic and unpredictable manner. Fast-forward to the present day, and you have apps such as “Endel” taking real-time data and creating soundscapes personalized to your environment that can change instantly. It's the music that is alive, always adjusting to who you are and where you are; something Eno would have surely approved of!

Moreover, even meditation programs such as Calm and Headspace have adopted Eno's guiding beliefs. They utilize constantly evolving soundscapes' technology to ease your mind or concentrate. The sounds are free-flowing, without start or end, following the way Eno envisioned ambient music - a continuous, natural process that never seems like it's “done.” These technology-induced soundscapes softly blend into your surroundings, ideal for assisting you in abandoning the absolute chaos of the modern world.

So, whether it's in a virtual reality game, a wellness app, or your favorite playlist, Brian Eno's impact on ambient sound is undeniably omnipresent. He transformed music into an interactive, immersive, and highly personal part of our world. Owing to his vision, audio technology today is not just about listening to music but about uncovering a whole new form of it, that is characterized by revolutionary experiences- and as everyone knows life becomes a whole lot sweeter with music around!

- Antara Singh
Class 9





QUIZ

1. What technology helps robotic bees mimic the behavior of real bees?

- A. Machine learning and robotics arms
- B. Artificial Intelligence and swarm programming
- C. Nanotechnology and solar sensors
- D. 3D printing and chemical sensors

2. Which biological molecule is being used to store vast amounts of digital data due to its density and stability?

- A. RNA
- B. Protein
- C. DNA
- D. Enzyme



3. What type of artificial intelligence can interpret facial expressions, voice tone, and behavior to assess a person's emotional state?

- A. Cognitive AI
- B. Affective computing systems
- C. Predictive modeling AI
- D. Machine vision systems



4. Smartphones and health apps can now predict mental health issues like depression or anxiety by analyzing:

- A. Heart rate and breathing
- B. Eye movement and pupil dilation
- C. Typing speed, sleep patterns, screen time, and location data
- D. Blood pressure and step count

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