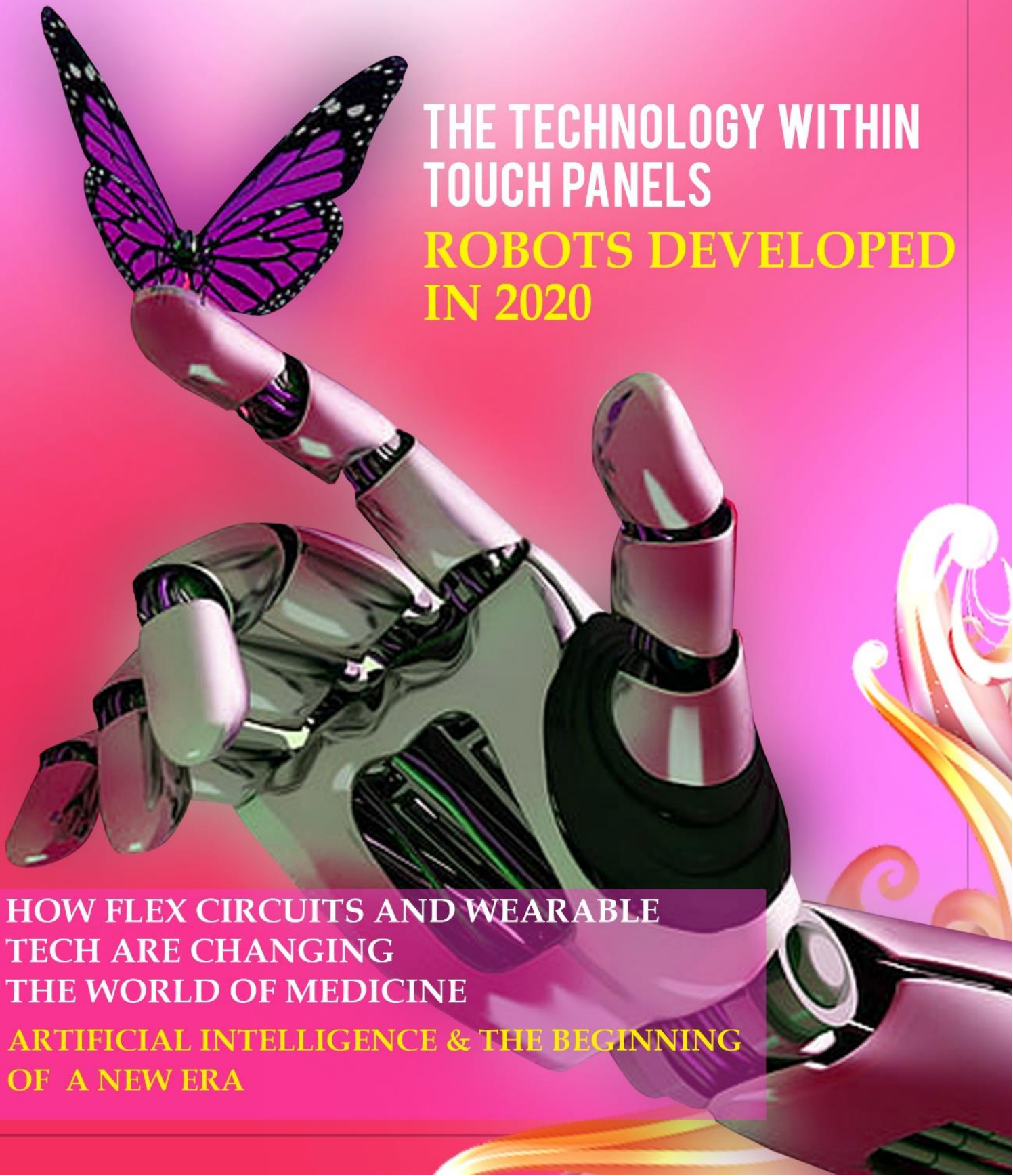
VOLUME 4 ISSUE 1

DEPARTMENT OF
MECHATRONICS

ASIMOZ

DEPARTMENT TECHNICAL MAGAZINE



THE TECHNOLOGY WITHIN TOUCH PANELS

ROBOTS DEVELOPED IN 2020

HOW FLEX CIRCUITS AND WEARABLE TECH ARE CHANGING THE WORLD OF MEDICINE

ARTIFICIAL INTELLIGENCE & THE BEGINNING OF A NEW ERA

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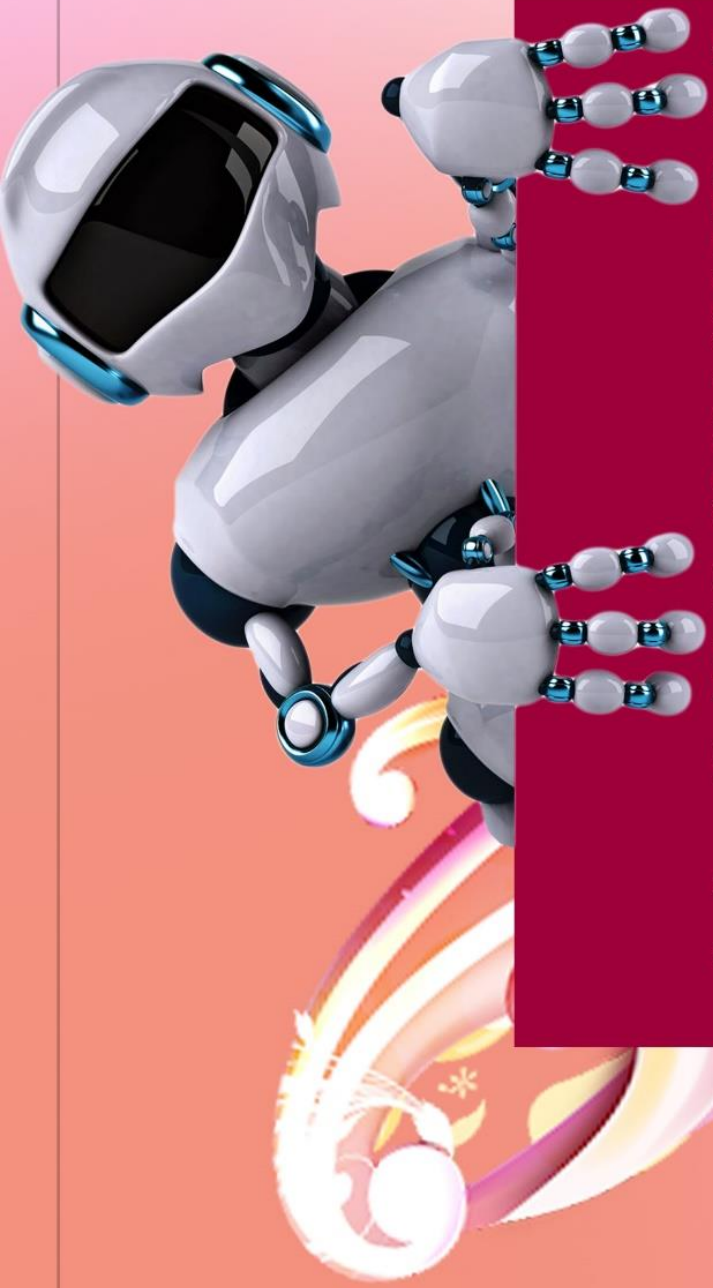


INSTITUTE VISION

To mould true citizens who are millennium leaders and catalysts of change through excellence in education.

MISSION

NCERC is committed to transform itself into a center of excellence in Learning and Research in Engineering and Frontier Technology and to impart quality education to mould technically competent citizens with moral integrity, social commitment and ethical values. We intend to facilitate our students to assimilate the latest technological know-how and to imbibe discipline, culture and spiritually, and to mould them in to technological giants, dedicated research scientists and intellectual leaders of the country who can spread the beams of light and happiness among the poor and the underprivileged.

DEPARTMENT VISION

To develop professionally ethical and socially responsible mechatronics engineers to serve the humanity through quality professional education

MISSION

1. The department is committed to impart the right blend of knowledge and quality education to create professionally ethical and socially responsible graduates.
2. The department is committed to impart the awareness to meet the current challenges in technology.
3. Establish state of the art laboratories to promote practical knowledge of mechatronics to meet the needs of the society.

PROGRAM EDUCATIONAL OBJECTIVES (PEO'S)

PEO1: Graduates shall have the ability to work in multidisciplinary environment with good professional and commitment.

PEO2: Graduates shall have the ability to solve the complex engineering problems by applying electrical, mechanical, electronics and computer knowledge and engage in lifelong learning in their profession.

PEO3: Graduates shall have the ability to lead and contribute in a team with entrepreneur skills, professional, social and ethical responsibilities.

PEO4: Graduates shall have ability to acquire scientific and engineering fundamentals necessary for higher studies and research.

DEPARTMENT OF MECHATRONICS
ASIMOZ
DEPARTMENT TECHNICAL MAGAZINE

VOLUME 4 ISSUE 1

Prof.Dr. Ambikadevi Amma.T
Principal,NCERC

Message from Principal

I have great pleasure to know that the students of mechatronics department of our college is bringing out a department magazine "ASIMOZ" for the year 2018-2019. Bringing out a magazine is not a easy task, but it is a venture of the combined efforts of students and faculties.

I wish every success to the venture.

Mr. Niveth L
HoD Incharge , MTR Dept.

I feel privileged in presenting the fourth volume of our department association magazine "ASIMOZ". I would like to place my sincere and heartfelt thanks to all those who have contributed to make this effort a success.

My special thanks to the Management, for their guidance which enabled us to bring out this edition. The magazine has a variety of articles endowed with different subjects contributed by the students of our department and their participation in various activities round the year.

I extend my gratitude to the entire team of the Editorial Board for their constant exertion, revision and support in bringing out the magazine in the present form.

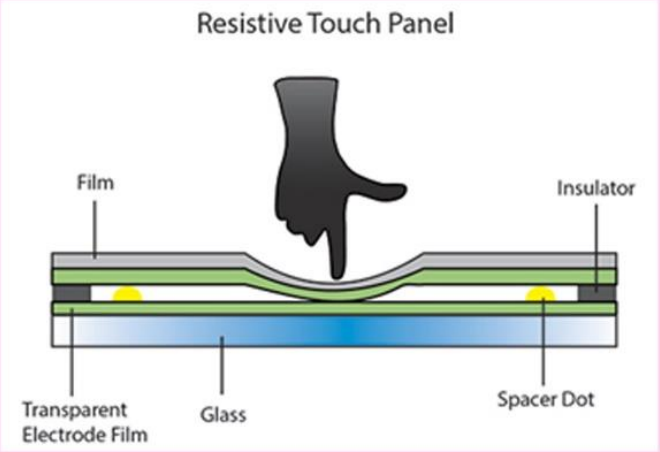
THE TECHNOLOGY WITHIN TOUCH PANELS

BY: - Manikandan C, 1st Year MTR
Nehru College of Engineering and Research Centre, Pambady

In quarter 3 of 2013 alone Apple sold 31.2 million iPhones. It's safe to say that there are millions upon millions of end products that use touch panels for user navigation. We've come a long way in technology but how do these touch panels actually work?

Resistive Touch Panels

Today there are over 20 different technologies that revolve around touch panels. A common type of touch panels are resistive touch panels (RTPs) which in 2012 made up approximately 26% of the market. These work by combining two conductive electrode layers separated by very small transparent insulation spacers also known as spacer dots. When pressure is applied from a finger or stylus it brings the two layers into contact. This results in a drop in voltage at the contact point which is then detected by a controller. There are three types of resistive touch panels each with their own unique attributes, 4-wire, 5-wire, and 8-wire.



Although there are three different types of resistive touch panels each work under the same principle, applied pressure brings two conductive layers together. The 4-wire construction consists of two separate layers; one layer carries the X and the other that carries the Y. A touch (applied pressure) will bring the two layers together and the contact point will then be calculated. The disadvantage of a 4-wire is if the top layer becomes scratched or ripped the X coordinate will no longer function and will need to be replaced. A 5-wire touch panel is constructed with a film that is suspended over the top layer and voltage is simultaneously measured at each corner. When a user touches the top surface it becomes in contact with the bottom layer causing a change in resistance which would then be calculated by the controller. Since the top layer is acting only as a probe it will still function if the top surface becomes scratched or torn unlike the 4-wire making it a more durable design.

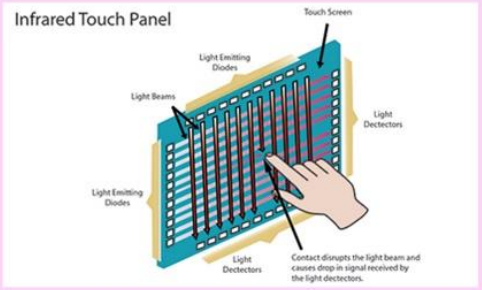
The last type is the 8-wire and this is based on the 4-wire technology principle by adding an additional 4-wire set. Having the additional set doubles the level of electrodes and in turn will increase the overall accuracy and reduces drifts so you won't have to recalibrate as much as you would with a 4 or 5 wire touch panel. The general benefits of resistive touch panels include lowest costs in comparison to other types of touch panels. Additionally, they offer low power consumption and are pressure actuated with a finger, gloves, stylus etc. RTPs are also resistant to external factors such as water and dust so if the end product were to be used in an outdoor application or in a machine shop it won't create a false actuation. Here are some limitations to consider when deciding whether or not RTPs are suitable for your application. You may be more familiar with multi-touch panels but the standard for resistive touch panels is one-touch. There are some controller companies working on multi-touch technology with resistive touch panels but again, it's not the standard.

Another limitation is the relatively low light transmission which approximately runs between 76 - 82% so if your graphics within the end product is a priority you may want to reconsider another type of panel. The touch life is lower for resistive touch panels because they use ITO film as the conductive material which is less durable than other options. Repeated pushing and selecting over time will create fractures and can degrade the touch panels' ability to operate. With a 4-wire and 8-wire expect 1 million actuations in one location because they both share the same technology. The 5-wire will allow 10 million actuations. The standard sizes for all range from 2.8" – 21" with additional custom sizes available.

Infrared Touch Panels

Another type of touch panel, are the infrared touch panels (ITPs). Infrared technology consists of infrared LEDs (Light emitting diode) and light sensors that are placed on the perimeter of the bezel. LEDs transmit beams of light that run parallel to the assigned light sensor create a light grid. Anything that disrupts the light or reduces the light such as a finger or stylus will register a touch the controller will distinguish where contact was made.

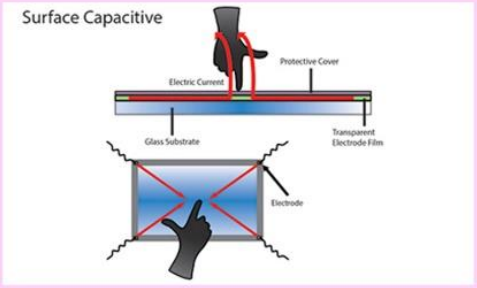
The benefits that come with using infrared touch panels start with the size. This technology works best with larger screens. Standard sizes are between 15"- 46" with options for custom sizes. Infrared touch panels are capable of multi-touch with two contact points which will work with any opaque object. There is no flexing of layers like that within the resistive panels so the durability and touch life is a lot higher. The light transmission is greater without the need of a glass substrate. Since there isn't a need for an extra layer of film or glass over the top of the application the light opacity won't be affected as much. There are a few limitations. One is the profile height due to the LEDs and light sensors they have a certain height to them so the bezel will be higher than in other technologies.



Furthermore, ITPs may be difficult to read under bright light, especially sunlight so generally infrared touch panels are used indoors.

Surface Capacitive

A surface capacitive works by measuring current. A protective cover is placed over the transparent electrode film which lies on top of the glass substrate. Voltage is applied to the corners and when a finger or stylus makes contact with the surface it disrupts the current. The controller then registers and determines point of contact.

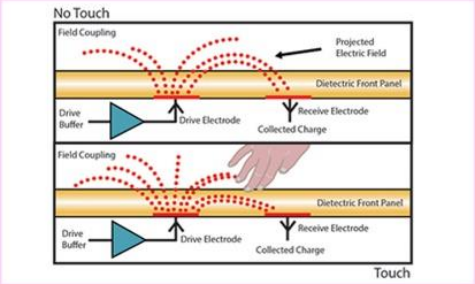


This type of technology is commonly used within the gaming industry. Here are a few benefits and limitations. The light transmission averages 90% or above. The application is unaffected by moisture, temperature, and dust. Since there is no flexing of the surface the actuations are very high, capable of reaching over 100 million. The downside to technology is that it is only single touch. The user will also have to use a finger or conductive stylus; a glove will not register contact. This may also require a bit of calibration which is due to interference that may be around the screen/LCD. The standard size ranges from 5" – 24" with the capability for custom sizes.

Projected Capacitive

Projected capacitive (PCAP) technology is the new powerhouse within the market. This is the same technology that is used within iPhones and iPads etc. In 2012 PACPs accounted for approximately 64% of the market place and will only continue to gain traction. The way this technology operates is that there are 1 or 2 parallel conductive layers that form an X-Y array of lines that make-up a grid of electrodes. These X/Y intersects are then scanned continuously.

An electronic field is actually projected through the top layer of glass so the energy is creating an electro static field. When a finger becomes close or touches the top of the surface the change in electrodes will be detected.
which will then calculate where the initial touch was made (See Figure 4).



Each technology has its own benefits and limitations depending on the intended use. The top layer is usually a durable scratch resistant glass. The projected capacitive technology is capable of 2-10 multi-touch simultaneously depending on the controller being used. The touch coordinates will remain drift free, precise position location. The lighting is excellent with a light transmission of 90% or more. The technology also allows for a zero-bezel deign, there is no need for any additional housing unit.
One of the more prominent features is the auto-calibration. The disadvantage is the higher cost as opposed to the other technologies. The only other limitation is that if a user is wearing gloves it is likely the controller won't register a touch. Currently the sizes available run from 7" – 21" with the most common being 7" and 10.1".

Controllers, Interfaces, and Operating Systems

In order to complete a full circle touch panels, need a controller, interface, and operating system to function. The controller acts as a translator of language to the operating system (driver) when a contact is made to the top surface of the touch panel. Some various types of controllers include PCBA, Chipset, and COF (Chip on Flex). The interface acts as a communication interface; this is how the touch panel is to be connected to the operating system. Examples of a couple interfaces are USB, RS232, and I2C. An operating system is the computer/motherboard. A few operating systems that are available comprise of Windows, Linux, and Android.

Conclusion

This article should serve as a solid foundation for anyone involved in the process of selecting touch panel technology for your end product. Be sure to answer a few general questions to help simplify the process. Start with determining the industry. Will this be used in the aerospace, medical, military, or another industry? Certain specifications may be mandatory depending on the industry. Determining the size alone may prompt restrictions based on the limitation of certain technology. Then think about the type of environment where the end product will likely be used; will the user be wearing gloves? Another question is what type of durability is required? Number of touches, surface strength, and the sealing requirements are all important factors. The last and possibly a deal-breaker is cost. It wouldn't make much sense to put a high-cost technology in a low-cost end product and vice versa. This set of questions will guide anyone in the right direction in the selection of your end product(s) and will help get your end product to market faster.

ROBOTS DEVELOPED IN 2020

By: - Rajith Krishnan
1st year Mechatronics
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There is an exponential increase in the research and development by organisations and academia in the field of robotics. According to reports, robots are expected to displace 20 million human workers worldwide by the year 2030. Let us look up at the latest robots developed in the year 2020:

• Ballie: At CES 2020, Samsung introduced its small rolling robot assistant that is intended to assist the users around the house. The robot is designed to understand, support and react to the user's needs around the house. According to sources, Ballie includes on-device AI capabilities that enable it to be a fitness assistant and a mobile interface that seeks solutions for people's changing needs.

• Bellabot: Unveiled during the CES 2020, BellaBot is a cat-faced full-dimensional sensory delivery robot developed by the Chinese firm, known as PuduTech. The robot is equipped with innovative multi-modal interaction and helps in making food delivery more friendly in manner. The robot is developed using Pudu Slam, which is a multi-sensor fusion SLAM algorithm independently developed by Pudu. It adopts a combination of various sensors such as vision camera, LIDAR, IMU, encoder, an RGB-D depth camera and ultrasonic radar.

• C-Astra: Launched by Invento Robotics of India in April this year, C-Astra is a smart LiDAR robot that helps in screening patients as well as disinfecting areas. C-Astra is a semiautomatic robot that is also being used to fight coronavirus. It used UVC light to disinfect buildings and thermal cameras to record the temperature of the body.

• Jivaka: Launched by Parel Workshop in India, Jivaka is a remote-controlled rover that works as a virtual healthcare worker. This med-bot performs several activities related to the patient's care, such as measuring blood pressure, oxygen saturation level, the temperature of the body, among others.

• MarsCat: Developed by Elephant robotics of China, MarsCat is a bionic intelligent home robot that aims to comfort and surprise the user. It is fully autonomous and can feel your touch, hear your voice, see your face and play with toys. The robot includes quad-core Raspberry PI and has features like image recognition, distance perception, etc.

• Neon: At CES 2020, Samsung's Technology and Advanced Research Labs STAR unveiled Neon, which is a computationally created virtual being that not only looks like a human but also behaves like a real human being. The virtual being can show emotions, communicate with human affect, intelligence, learn from experience and create new memories. According to sources, the virtual being can assist with goal-oriented tasks and can also be personalised for tasks that need a human touch.

• PowerEgg X: PowerEgg X of PowerVision Robot Corporation, China, is a high-performance drone that is suitable for highly dynamic aerial photography, where the user can control real-time 1080P image transmission within a distance of 3.7Mile. The PowerEgg X features strong face recognition capabilities and is continuously improving through deep learning training to follow the object when taking a photo or recording a video. It has a flight time of 30 minutes.

• Surena IV: A team of 50 Iranian roboticists from the University of Tehran's Centre for Advanced Systems and Technologies (CAST) unveiled one of its most advanced humanoid robots known as Surena IV. The robot shows several human-like capabilities such as grasping a water bottle, writing its name on a whiteboard, mimicking a human's pose. The robot relies on a whole-body motion controller that continuously adjusts its posture to avoid falls. Also, the custom force sensors on the bottom of its feet assist the robot in stepping over uneven surfaces. It can do so by adjusting the angle and position of each foot.

• Stretch RE1: Stretch RE1, developed by Hello Robot of The United States, is a lightweight and low-cost mobile robot that is equipped with a telescoping arm. It is said that the robot is designed for researchers developing robot applications to help people in homes as well as workplaces. The developers designed this new kind of robot for autonomous operation, and it interacts with people by using a low mass, contact-sensitive body. The robot is composed of a gripper, a computer, sensors and software including Python interfaces and ROS integration.

• Vyommitra: Vyommitra is a female humanoid robot unveiled by the Indian Space Research Organisation this year. The robot is said to be capable of doing multiple tasks and is expected to fly in the first unmanned flight as part of the first human spaceflight programme (Gaganyaan), which is scheduled for later this year. The robot is said to speak two languages and can also mimic human crew like switch-panel operations and more.

HOW FLEX CIRCUITS AND WEARABLE TECH ARE CHANGING THE WORLD OF MEDICINE

By: - Jithin Anand N
1st year Mechatronics
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Epic Engineered Technologies

Wearable innovation is something that a serious huge number of individuals utilize each day—and don't understand they are utilizing it. The term sounds convoluted and exceptionally specialized, however as a general rule, most wearable innovation gadgets being used today incorporate items like keen watches (Apple iWatch or the Kickstarter-made Pebble) and action trackers, (for example, Fitbit and Garmin's Vivo smart.) Wearable innovation has improved lives for many individuals in rather direct manners—up until now. Nonetheless, the innovation is new. Wearables are starting to gather a ton of consideration for their capability to accomplish something other than following advances and controlling Pandora playlists.

Later on, it is altogether conceivable that wearable innovation and flex circuits could assume a significant part in the clinical business. Indeed, these gadgets have effectively started appearing in certain clinical settings. We will examine a couple of the manners in which those wearables have and could affect medication.

Figure 1: Example of an adaptable circuit board.

To address the innovation, a consistent theme that the vast majority of these gadgets share is that they require a flex circuit board. A flex or unbending flex circuit board is a basic segment for these gadgets to have the option to work effectively. Besides, flex circuits offer improvement or decrease in bundling necessities. As such the size of the unit can be decreased by utilizing flex and unbending flex instead of different techniques for interconnect making the gadget more convenient/wearable. A great deal of times a flex or inflexible flex should be utilized to meet plan size necessities.

Clinical Wearables Tend to be Single Point Solutions

One thing to remember is that while the shopper market is pushing wearables to accomplish to an ever-increasing extent (take a gander at the most recent variants of the wellness trackers and the number of additional highlights they incorporate, for example,) the wearable clinical market is going the other way. Most clinical wearables will in general be one arrangement gadgets. For instance, a clinical wearable will follow "just insulin levels" or "simply steps strolled." Just on the grounds that these gadgets just screen one number doesn't make these gadgets any less viable or effective.

Truth be told, this was done more to guarantee that the information gathered is helpful information, and not discoloured on the grounds that the instrument is attempting to do a lot with excessively little of a gadget.

Clinical wearable gadgets additionally have a huge potential to utilize the very systems that purchaser wearables do—to follow numerous kinds of information immediately. The worth in this is that a patient experiencing a persistent ailment could profit with their primary care physician finding out about different layers of clinical information. The development of multi-use gadgets is something that will happen more as innovation propels and the current apparatuses become better at what they do.

Clinical wearables are not regularly the garish, lively wristbands that strike a chord when shoppers consider wearables. Be that as it may, they are exceptionally successful, and the market is developing greater consistently.

Wearables for Physicians

Incorporation of Current Devices into Practice – One of the primary ways that wearable innovation is well on the way to affect the clinical business is if the gadgets move from being rigorously a purchaser gadget into being a "clinical" gadget. A valid example—a specialist may give an action tracker, similar as a Fitbit to their patients. The data gathered by this gadget would not exclusively be accessible to the patients yet additionally to the specialist. At the point when the doctor has data from the gadget, it gives that person a greatly improved thought of precisely how much, and what kind, of actual work the patient is accomplishing consistently.

At this moment the specialist needs to believe the data given by the patient. While most people need to give legit data, what number of individuals have a precise bookkeeping of what amount practice they get? As well as following advances, a portion of these gadgets can gauge pulse or can even be utilized to support the estimation of caloric admission.

Wearables to Track Chronic Conditions

Another interest that doctors have in wearable innovation is the capacity these gadgets have, and may one day have, to follow ongoing conditions. Staying aware of patients that have diabetes, hypertension, coronary illness, asthma and other ongoing conditions can be a test. Regardless of whether the specialist requests that the patient stay aware of specific numbers or track exercise and diet, the patient may not generally go along. A wearable assists the specialist with being there 24 hours per day, seven days per week. The specialist has an understanding into the patients' way of life and can more readily treat current and future manifestations, with the right data nearby.

Wearables for Patients

For patients, the advantage of wearables is that they improve consideration from their doctor group—even in a bustling setting. The basic "Fitbit" like gadget makes it conceivable to associate with the specialist on straightforward exercises like exercise and diet. The following worth is the reason such countless individuals are deciding to wear these gadgets in a non-clinical setting. Add the information following instruments in and it makes an astounding route for patients to keep in contact with specialists. In any case, in all actuality, that is just the start of how patients can profit.

Patients don't generally get the degree of care they need or need, in any event, when experiencing a serious sickness or infection. The justification this is that there essentially aren't sufficient specialists or the expense to have specialists "on staff" serving patients in this limit is basically unmanageable. Another item called "Bio-Patch" has now been endorsed by the FDA and is gradually being placed into utilization by emergency clinics, as indicated by VentureBeat. The Bio-Patch is a little gadget that is appended to a patient's chest to screen vitals and gathers information all for the duration of the day.

With a screen set up, it implies that the clinical staff can watch out for the patient's prosperity in any event, when there isn't a specialist (or attendant) in the room. Indeed, the Bio-Patch can even be worn home and tell the emergency clinic of any likely issues. At times, it might permit patients to leave the clinic prior—setting aside cash and permitting them to be more agreeable.

One benefit a flex circuit board has in the clinical business is that the material polyimide it is produced using. Polyimide has been supported by the FDA to have the option to have contact with human skin. It is a confirmed material and it doesn't make any sort of unfavourably susceptible response the patient. This makes flex circuits an extraordinary fit inside the clinical and wearable business sectors.

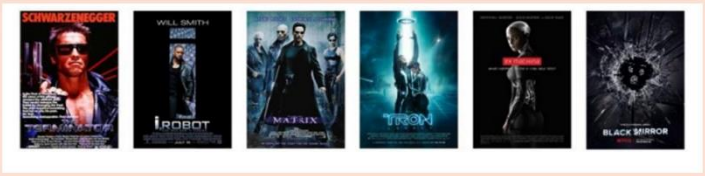
Conclusion

The reception of wearables is as yet in its development stage. Indeed, it is assessed that the wearable market will develop from a $3 billion dollar market to a $50 billion dollar market from 2013 to roughly 2018. It will require some investment to decide precisely what kind of effect adaptable circuit innovation will have on the clinical business overall. It very well may be that in a couple of years we were unable to envision a medical clinic being run without these gadgets. The truth will surface eventually.

ARTIFICIAL INTELLIGENCE & THE BEGINNING OF A NEW ERA

Muneer M
3rd Yr, Mechatronics Engineering ,N C E R C, Pampady

AI has made a huge leap during the last decade. This leap became possible with technological
improvements in families of methods in machine learning for text, voice and image recognition;
language and video reconstruction; as well as computer-aided design. How far are we from the world,
where there is no more space for humanity?



Fueled by fears and images created in the sci-fi movies, people start to fantasize about robots and the
overwhelming crisis for society caused by super-intelligent machines. Let's bring some clarity. The level
of AI can be subjectively broken down into three main categories: Artificial Narrow Intelligence (ANI),
Artificial General Intelligence (AGI) and Artificial Super Intelligence (ASI). ANI is the only form of Artificial
Intelligence that humanity has achieved so far with respect to a measurable number of tasks. However,
we can already see applications where ANI solutions in medicine, law, architecture, design, music are
surpassing human accuracy and productivity. Numerous successes have been reported recently, but,
because of the negativity bias, the huge media coverage is focused on failures.

The fields of computer vision, natural language processing are still at the stage of narrow AI, even if their
advances seem fascinating. Narrow AI is good at performing a limited task, such as playing chess or go
games, making sales predictions, calling and booking appointments, matching people in social networks
or performing weather forecasts. Basically, narrow AI works within a very limited context, and can't take
decisions on tasks beyond the goals for which it was initially created. At the same time, decisions that
are made by AI could be complex due to the nature of the context. How do we evaluate different
decisions and contexts from the ethical perspective?

Artificial Intelligence is the zenith of the currently prospering technological systems,which in the near
future shall revolutionize the existing portal of information processes and the way humans perceive
automation.

Is AGI A Huge Challenge Already ?

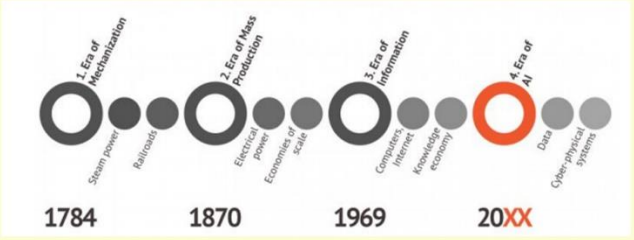
If the reality is that we can actually control decisions made by AI, why does the fear still exist? In most cases, individual and societal coping skills are about awareness of reality, of what is possible and what is not. As a result of the proliferation of AI, we are simply afraid to be excluded from the crucial aspects of decision making at a personal or group level. We want to understand what to expect from a society where humans and AI work together as well as from each single AI-powered solution.

To address the issue, we need to design inclusive systems and "explain" these designs. Such systems should embrace participatory behaviors in ways that humans can control the boundaries of outcomes. In the information era, humans frequently live with a vague sense of danger that with time becomes their normal mental and emotional state. Such a state comes from ever increasing and evolving dynamics in the environment. Skills to respond to the fast-paced change are required. Indeed, facing uncertainty without information is hard.

What should we do to fill the skill gaps? What kind of knowledge do we need to build to govern existing and emerging AI in different sectors?

HOW THE ERA OF ARTIFICIAL INTELLIGENCE WILL TRANSFORM SOCIETY?

McKinsey analysts estimate the automation potential for all economic sectors to be around 50%. This means that around half of all the activities people in the world's workforce are paid to do today could potentially be automated with currently available technologies. It represents almost $15 trillion in wages (about China's GDP today). Historically every industrial revolution (Figure 1) has had its primary driving factor. For example, the adoption of electrical power defined the era of mass-production and led to the economies of scale, impacting both capital and labor. The huge societal challenges arriving with automation resemble the challenges of industrial revolutions.



AI is an analytical domain that combines concepts from data, and many diverse regulations to create results that transform inputs, generate the impact on the real world, and support make determinations with issues-systems professionals to set up extensible, powerful techniques, and expressing the greater communal and indirect extension of the proceeding strategies. As computing abilities developed promptly over the occurrence of building new businesses such as support systems. New business designs would appear to be valued to deal with this circumstance, manifesting and lack of algorithms refer to the exciting dream of understanding in the program with a system maintaining standard intelligence.While relevant fields such as applications analysis, performances, sequence acceptance, and knowledge provision were generally caused by AI. The understanding of three-dimensional architecture to bounce among its high-level interpretation and on carrying out smooth-building., analyses of assumptions and outcomes.

One could commonly set to point out to AI, and certainly, that is what comes out to have taken place as such classified occur as a revelation to boost or factors analysis of the matter of need and financial releases at performance.A complementary objective to AI that is repeatedly involved in Intelligence Augmentation.

Combine all this data being generated, with the advances being made in the compute power, AI and ML, will lead to next wave innovation. In fact, the time is not far when businesses, will harness AI to do datadriven "thinking tasks" for them, significantly reducing the time they spend testing new innovations and in debating and scoping options. It has become imperative for every business to explore AI and ML to providing differentiated solutions, to help meet the varied and ever-changing needs of their customers

Conclusion and future perspectives

It is true that the industry is quoting theorists (and sceptics) who claim that AI will replace jobs. However, in a more positive realm, these new technologies have the potential to eliminate mundane repetitive tasks, reducing human errors and bringing in efficiency. These technologies should be seen as yet another tool (or machine) available to us to do our job efficiently and accurately. In every field tools and machines have evolved to make us more efficient and accurate – logarithmic tables evolved to calculators, mechanical Vernier Callipers and Screw Gauges have evolved to digital versions, industrial designs and mechanical drawings are no more manual but generated using CAD tools. The journey in banking from ALPM to Core Banking to NetBanking as well as the journey in telephony from only voice connectivity to data connectivity are other examples. As is true with all these advancements, none of these have eliminated or reduced jobs, instead it has made us more accurate and most importantly expanded employment opportunities. Similarly this shift will create new job opportunities in the next decade, unleashing new options and new job specializations. For example, we will see the emergence of a new type of IT professional, who will be concentrating his/her efforts on AI training and fine-tuning.

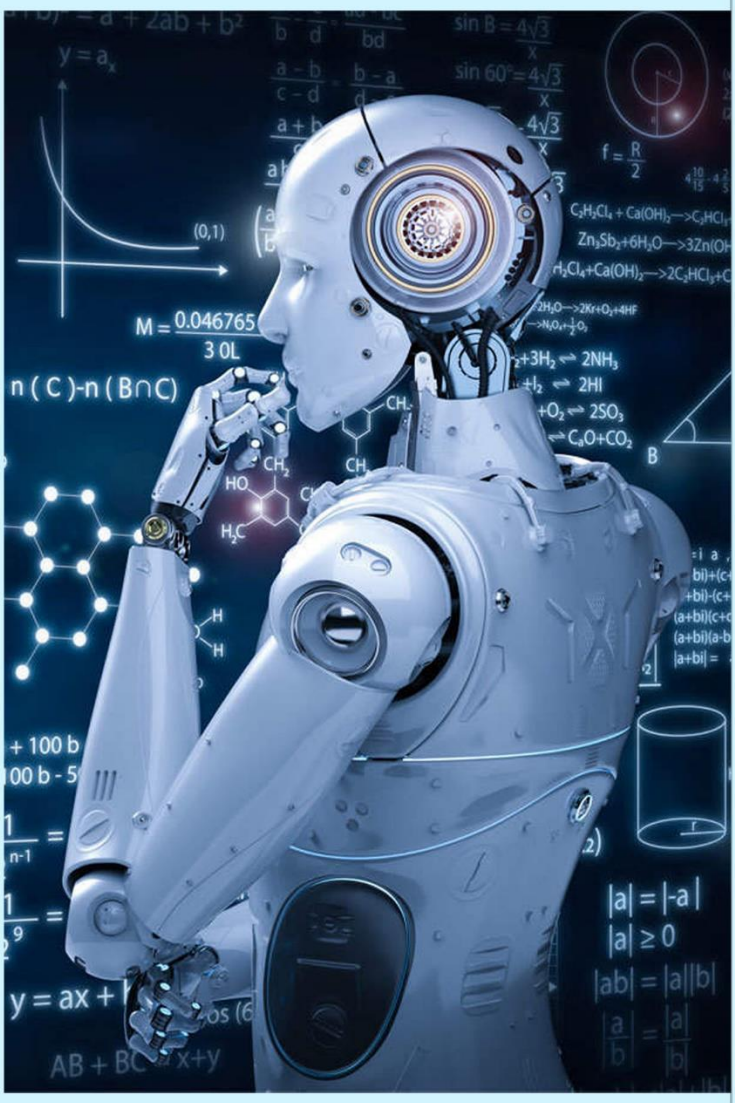
India is at the hub of all these and many more such technological advancements and will soon become the home of these skills development, with AI dominating the skillsets of future talent.

Overall, AI is always improving the efficiency of medical images reading, assisting in the diagnosis and treatment systems and helping with the personalization of rehabilitation training, in order to achieve more precise application in the medical management of stroke. The imaging data of stroke is widely handled by DL, achieving automatic segmentation of lesions, automated characterization and multimodal predictiSince the diagnosis of stroke is mainly confirmed by imaging, and taking into consideration the large amount of imaging data being collected, processed and compared, AI-based methods have the advantages of being fast and accurate, of low cost, easy to promote and able to provide remotely assisted diagnosis. However, we are currently facing some difficulties. Firstly, due to the confidentiality and privacy rules of the data from various hospitals, AI systems that require a large amount of data training might have some difficulties gaining access to those resources. Secondly, to ensure the accuracy of diagnosis, a large amount of clinically confirmed diagnoses must be available.

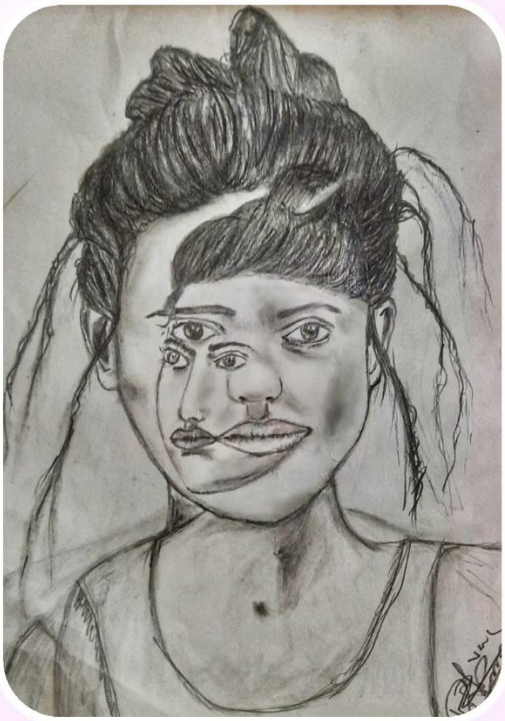
The imaging data and the medical record data should be exported, thus the loads of subsequent work could be enormous. In the future, wide range research and further identification and information digests of multiple imaging data will be needed to guarantee accurate predictions, this will provide work guidelines for future clinical practices.

In the field of rehabilitation, AI has a very broad potential for applications, not only regarding patients with disabilities caused by stroke, but also those suffering from physical dysfunction caused by various reasons. Many rehabilitation exercises could be more feasible when combined with AI systems.

However, it is important to mention that accurate diagnosis and training mode are very critical, and rehabilitation training is different for different parts of the limbs and different degrees of post-stroke patients. To achieve AI-based personalized assessment and rehabilitation training, all disciplines should cooperate, in order to effectively improve the desired neurological function with regard to distinct types of neurological dysfunction.



Students Corner



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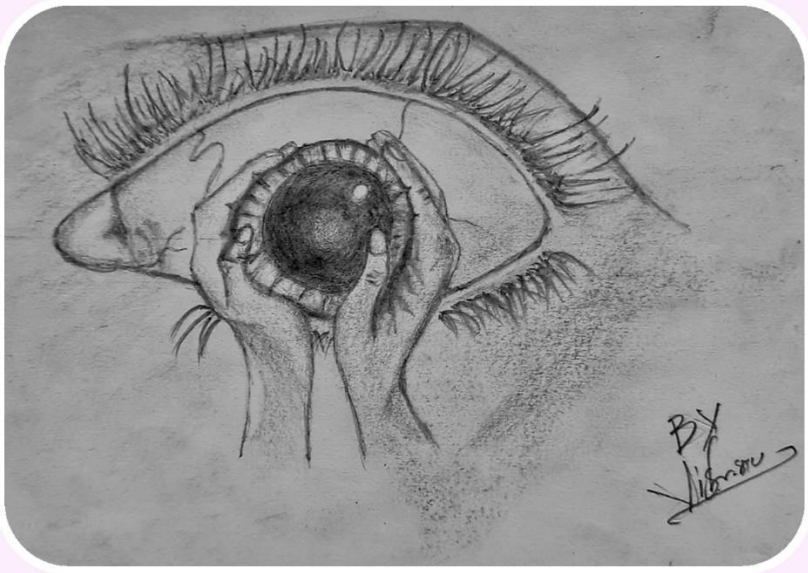

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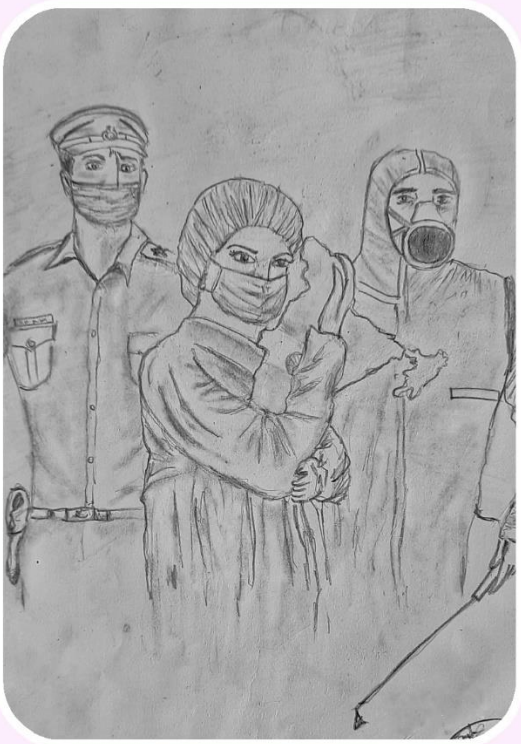

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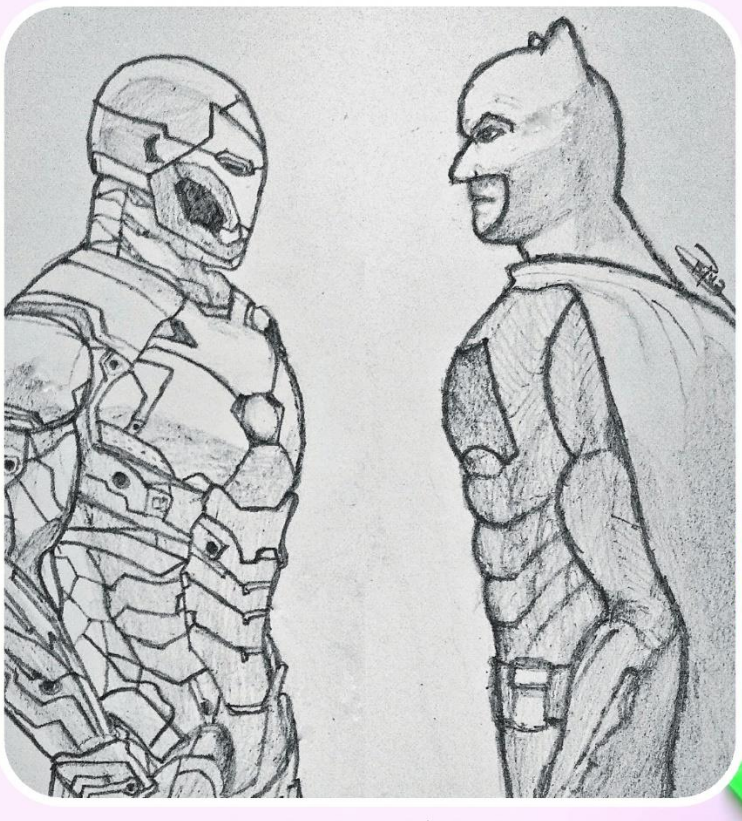

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