



# TECHNO SPARK



ANNUAL COLLEGE MAGAZINE

TECHNICAL SECTION

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TechnoSpark is the combination of word Technology and Spark which means that it is the science of sparkling that produces in young mind. This section is dedicated those young mind who belongs to technology and inventions.

In today's scenario technology has spread its wings in all the sectors with beautiful inventions and technics. Every day there are new ideas & advancement in technology as world becomes more involved in progress and developments. The simplest form of technology is the development and use of basic tools.

Yesss! Technical growth and success this is what changing the world. The quote "necessity is mother of invention" makes right in this Pandemic and Covid-19 situation for invention of Vaccines. Technology has advanced so much that it has captured our breath. This technical section subjected to the inspiring and innovative minds with creative ideas.

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# Human Intelligence vs Artificial intelligence



**Shubham Waghamore**

B.E. (CSE)

Human beings are supposed to be joyful and do something that no AI can do. AI can do everything that you can do except it will not do in consciousness.

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Are you scared of Artificial Intelligence (AI)?

Do you believe the warnings from folks like Prof. Stephen Hawking, Elon Musk, and others?

Is AI the greatest tool to and for humanity will ever create or we are "summoning the Demon"? For me it's not AI that is to be worried for me it's Human stupidity.

BCI, Neural Lace, and HI your brain is composed of 100 billion cells called neurons, making 100 trillion synaptic connections. These cells and their connections make you do, think and feel. In combination with your sensory organs (i.e, eyes, ears), these systems shape how you perceive the world and sometimes it fails.

That's where neuroprosthetics come into the picture. The term "neuroprosthetics" describes the use of electronic devices to replace the function of impaired nervous systems or sensory organs. They've been around for a while the first cochlear implant was implanted

in 1957 to help deaf individuals hear (cochlea is a hollow, spiral-shaped bone found in the inner ear that plays a key role in the sense of hearing and participates in the process of auditory transduction) and since then, over 350,000 have been implanted around the world, restoring hearing and dramatically improving the quality of life for those individuals.

But such a cochlear implant only hints at a very exciting field that researchers call the brain-computer



interface, or BCI: the direct communication pathway between the brain (the central nervous system, or CNS) and an external computing device. The vision for BCI involves interfacing the digital world

## ... Human Intelligence vs Artificial intelligence

with the CNS to augment or repair human cognition.

You might have heard Elon Musk and others talking about a "neural lace" (this was a concept coined by science fiction writer Iain M. Banks). Banks described a "neural lace" as essentially a very fine mesh that grows inside your brain and acts as a wireless brain-computer interface, releasing certain chemicals on command.

Neural lace is an ultra-thin mesh with a collection of electrodes capable of monitoring brain function and facilitating direct computing capabilities from thought. It is inserted through the skull using a tiny needle containing the rolled-up mesh which unravels spanning the brain.

### Human Intelligence (HI)

Humans have always built tools of intelligence. We started with rocks and progressively built more intelligent tools such as thermostats, calculators, computers, and now AI. These are extensions of ourselves, and so we've been increasing our intelligence through our tools. But now, our tools have become sophisticated enough that we are about to incorporate them into our biology and take an exponential leap forward in intelligence. This is so significant that it will change us as a

species — we're taking evolution into our own hands.

### Will AI takeover HI?

The first step is to answer the basic question: can we mimic the natural function of neurons firing? If we can mimic that natural functioning, and restore circuitry, or even if we can just maintain that circuitry, it begs the question: could we improve that circuitry? Could we make certain memories stronger? Could we make certain memories weaker? Could we work with neural code in the same way we can work with biological code via synthetic biology or genetic code? How do we read and write to neurons? well, these questions are still not predictable by me. At last, humans are developing AI to evolve their intelligence to another level but in reality, they forgot to work on their own intelligence which is lowering themselves.



PLEASE WEAR  
A FACE MASK

## Introductions to X-Ray Diffraction



**Ayan Shaikh**

B.E. (MECH)

"The important thing in science is not so much to obtain new facts as to discover new ways of thinking about them" - W. L. Bragg

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X-ray diffraction is one of the greatest experiments in 20th century physics. It is one of the most basic experimental techniques in crystallography (Branch of science dealing with arrangement of atoms).

### History:

In 17th century there was this one question that intrigued many physicists that in nature why do things have regular external shape? For e.g. Why do leaves or fruits have regular external shape? This was a very fundamental question. At that time atom wasn't even defined. Keppler and Hooke thought on this and they gave a postulate that there must be some building blocks that have regular arrangement. This was just a postulate and what is that building block that also wasn't clear.

In 1895, Wilhelm Rontgen discovered X-rays. This was remarkable discovery which earned him Noble prize in 1901 and this was the first noble prize in physics. X-rays were very new at that

time and one more big question arrived that whether X-rays are waves or particle? Again, many physicists said that it is wave some said it is particle nature. In 1914, Max von Laue gave a postulate that

- 1) If crystals are periodic arrangement of atoms and
- 2) if X-rays are waves, then crystal should have diffraction of X-rays. This are two big if's in the first statement the definition of



crystal was defined because people didn't have clear idea about crystal and in the second statement the nature of X-rays was defined. The experiment was carried out and it was successful. This was

## ... Introductions to X-Ray Diffraction

one of the greatest scientific discovery that X-rays are waves. After a single experiment he had two great results. This discovery gave him Noble prize.

Later came Bragg and he gave a law that was essentially saying that the diffracted beam can be viewed as a reflected beam from a particular plane. This gave him a Noble prize in 1915. His recipe for noble prize was to call diffraction as reflection!

### What is X-ray diffraction?

X-ray diffraction is a technique used in materials science to determine the crystallographic structure of a material. XRD works by irradiating a material with incident X-rays and then measuring the intensities and scattering angles of the X-rays that leave the material.

### How does it work?

Crystals are regular arrays of atoms, whilst X-rays can be considered as waves of electromagnetic radiation. Crystal atoms scatter incident X-rays, primarily through interaction with the atom's electrons. This phenomenon is known as elastic scattering; the electron is known as the scatterer. A regular array of scatterers produces a regular array of spherical waves. In the majority of

directions, these waves cancel each other out through destructive interference, however, they add constructively in a few specific directions, as determined by Bragg's law:

$$2d \sin \theta = n \lambda$$

Where  $d$  is the spacing between diffracting planes,

$\theta$  is the incident angle,

$n$  is an integer,

$\lambda$  is the beam wavelength.

### Applications:

Today x-ray diffraction is used in many sectors like pharmaceutical industry, forensic science, geological applications, microelectronics industry, glass industry, corrosion analysis.



## Everything is Online – Digital Birth



**Ajay Jakune**

B.E. (CSE)

Never before have a handful of tech designers had such control over the way billions of us think, act, and live our lives.

One day I decided to watch a series with my friends and all agreed. On that day we thought while watching we need some tasty food to make it complete and look like a party. Then I got an idea to order food online, thought that, why to go to restaurant!! we could have it delivered at home with amazing offers and exciting cash backs. We all contributed and ordered it online.

5-6 years ago, I was not even able to imagine that one days I will order food and it will get delivered. Today, while reading this you will not feel that much shocking because, now it is casual for you. Now a days, everything is online we don't have to go outside and search for anything. All comes to your fingertips. Just two-three clicks and swipes and done.

Isn't it beautiful, isn't it great? Whatever you want you can buy online. Groceries, Food, Cloths, Home Appliances, Electronics, Books, Accessories and many more. Even you can sell old things, so

other can buy them as a 2nd hand product on the internet. Let's talk about other thing, how about social media? Anybody who has internet access they are on social media.

Everyone creating their virtual presence on internet and share their information to create profile like who are they? What they do? Where do they live? Birth date, Relationships, everything they have. People feel connected on social media more than in real life. They connect



with known and unknown people out there and make friends all around the globe. On social media they share their memories, achievements, status in the form of images and videos and all others

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<https://youtu.be/iffHXmaQdY4k>

## ... Everything is Online – Digital Birth

like and pass comments on it. How amazing it is! We all connected and all are just two finger taps away from each other. World is so small wow. Here is one more interesting thing, People are searching for partners online websites for marriage and dating. Matching their traits based upon what they have written on their profile. How easy it become! searching for life partner by just sitting in home, scrolling down pages.

Everything is online so what leftovers, oh education, how it will remain behind. Student have to know what and how he/she has to learn. They themselves can learn it online by watching recorded videos on various platform, some are paid and some are free.

They will also get certificate or degree that they can showcase in their profile/resume for job or to show achievements for further higher studies. These learning don't take much of time and most of the content are to the point. Most good thing about online courses that one can learn with their own pace and they don't waste your years of life just to learn some subjects plus saves lot of money. These courses teach one of basic thing i.e., self - learning  
How great internet is! We have access to whole world; we are connected to

different people around the globe as a family.

Wait Wait Wait...This only one side of the story,

Above information is only one side of coin. There are serious issues which we have to understand. All we are doing is creating our own virtual version i.e., giving ourselves a digital birth and trying to live a new digital life. Which is not that good as we thought. While using different online technology we are giving up our ability to work, ability to think, losing our control, losing connection with nature and harming relations with other people in real life, loosing human power by just sitting and surfing over the internet finding unwanted things and watching them, loosing attention time span. Doing everything online may damage your healthy life, it comes with worst side effects like increase in anxiety, depression, stress, insomnia.

"Remember"

The technology that connects us

Also Control us

The technology that connects us

Also Divide us

The technology that connects us

Also Distract us

The technology that connects us

Also Monetizes us

The technology that connects us

## ... Everything is Online – Digital Birth

Also Manipulates us

The technology that connects us

Also Polarizes us

What you think, everything you do online is free, you don't have to pay anything for whatever you do online. Take a moment and try to think why all these 'Tech Giants' created these amazing things gave you to use at free of cost. Again, keep in mind **"If you're not paying for a product, you're the product"**. There's no such thing as a free lunch.

Lets see what happens when you create a social media account. When you first sign up on social media you have given n number of choices to choose from what type of content you like, who you want to follow, who do you want to make friend likewise. When you enter you will see content of your choice but later you will end looking at the content that those tech giants want to show you. Once you gave attention to any post, they will start showing you similar content, then you jump on that similar post, this continues until you get addicted. They track your each and every movement, which posts you like, which you don't, how much time you have spent on watching particular content. This is like a loophole in which you get trapped and get addicted. You will come daily to see those contents and this will ultimately

reduce your attention span, you are like a free butterfly jumping from one post to another in a garden of tech giants. They analyses your data and depending upon that, show you ads, sell your data to other third-party people who will use to make there profits. You will unknowingly and unconsciously give your control in their hand.

They continuously monetize you. Have you ever posted something on social media and then later checked to see how many "likes" you received? Why do we want to be liked? As social beings we like to talk about ourselves. We always want everyone should give their attention to us.

'Has anyone liked something of mine'? 'Has anyone tagged me'? Etc etc. It's a habit we quickly get pulled into. It's addictive. That little rush you get when your post gets more likes than normal? There is a reason behind that rush i.e., Dopamine. For every thumbs up or heart we get a little psychological high through a shot of dopamine. The more likes the more shots. The more shots we have, the more shots we want. And we're in a loop. Scientists used to think dopamine was responsible for pleasure in the brain, but we now know that rather than create pleasure it makes us seek it.

When someone pass wrong/rude

## ... Everything is Online – Digital Birth

comments on your post you feel bad, you get disheartened, discouraged. Might you feel depression and get angry at same time. Say you have achieved something or you got job and you sheared this information on social media as well as with your family. Your family will celebrate it for your happiness but your whole attention will be on social media, collecting congratulations from known and unknown people who don't even care how much hard work you put in those achievements. Ignoring the real-world family and friends, we give more attention to virtual world people. A 5000 person study found that higher social media use correlated with self-reported declines in mental and physical health and life satisfaction. The number of countries with political disinformation campaigns on social media doubled in the past 2 years.

64% of the people who joined extremist groups on Facebook did so because the algorithms steered them there. That's why we should avoid excess use of social media. Okay what about online education, it is not harmful right?

Hahaha, here not students but parents get distracted by offers made by marketing sales persons. Internet has hell lot of data, most of data is unrelated and misleading. Students has to precisely find

the information for self-learning without getting distracted. As said earlier, many companies pour their money in marketing rather than working on their content and improving it.

And they sale these courses for huge price which is not worth it. Many students and parents put their income in these courses by looking at companies' false advertisements and fraudulent result claims. After enrolling they get to know that the claims are fake, content is not that much good when compared with its price.

These companies now targeting children of age 5 to 10yr old. Selling the high-level courses with low quality content which are not even suitable for those ages by misguiding parents or by charming parents about their child (e.g., Your child is so smart/brilliant/intelligent, he is way ahead of other children blah blah blah).

That's why it is way more difficult to find good content online to learn at free of cost or even paid one. And most importantly there is no such thing like character development or social development in online education which is vital part/essence of learning. As we all are social animals. We give more attention when we learn face to face. In online education we required to look at

## ... Everything is Online – Digital Birth

screen continuously which emits blue light, harmful to health.

Online shopping is on another level, try this: go to any shopping website search for any products and checkout 2-3 products, after that try to visit different websites then you will see ads of same product that you have checked on shopping website. It leverages you with discounts and offers. It is like someone is following you, someone is sitting behind your device and tracking your movement without your permission.

How do you feel when anyone looking and spying on you? Due to these kinds of things sometimes you end up buying unnecessary products. One of my friends buys new smartphone every year. One day I asked him why you have bought new phone when old phone is working absolutely fine even you have bought it only few months ago. He said, "There is a big offer and huge discount". I said, "Then what? You have to pay money even though offer is there".

Wasting money on needless products. Same goes with the online food order. For a first time when order food with exciting cashbacks you feel good. But later these orders will be made on regular basis. Eating unhealthy food on daily basis. If we keep ordering food online then one day, we will forget to

enjoy going outside for restaurants with family/friends for party/celebration, which creates real happiness in our life. Talking about Matrimonial websites, finding partner online is one of the worst things I have ever heard in my life. What is point of your existence if you're finding your life partner on an online platform in a virtual world.

Today's new generation directly entering in digital world from age of 2 to 3yrs without experiencing real world. And tragedy is that many people encourage these children to do so. Human being is weird animal. If we try to understand human psychology then we will find that we humans are always tend to do work which has minimal friction and less challenges. But as we know challenges are part of life and they are necessary to improve our ability and intelligence. These 'Tech Giants' reducing that friction between work and you and ultimately they are removing challenges from real life. Everything is now accessible in 2-3 taps.

Never before have a handful of tech designers had such control over the way billions of us think, act, and live our lives.

So, what is a solution? Balanced and limited use of online resources whenever necessary. Only order food in

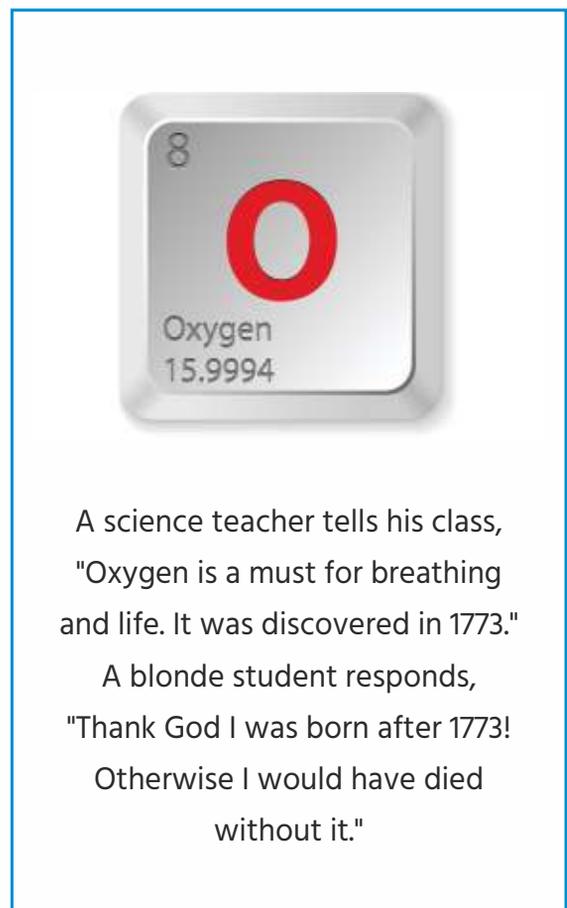
## ... Everything is Online – Digital Birth

case of emergency or you are celebrating any special event at home if you want. Only do shopping whenever you need something and which is not available near you or huge discount available on online platform and you trust it. Only use social media if you want to find your friend or relative who is not in contact with you for long time or for quickly sharing any necessary document or files and avoid excess use.

And as we know we are facing this enormous pandemic situation, there is no other option than online education but we should try to focus on how we can improve it and get good quality education.

At final I would like to say we should come out of this virtual world and try to explore the amazing real world. 'We are not a part of Nature, but we are the Nature'.

We should travel around the world, meet new people, go outside for celebration, make real world friends, play real world games, face challenges that makes us stronger physically as well as mentally, learn from nature. We should express our thoughts, feelings, emotions in real world rather than virtual world.



A science teacher tells his class, "Oxygen is a must for breathing and life. It was discovered in 1773."

A blonde student responds, "Thank God I was born after 1773! Otherwise I would have died without it."

# The Impact of Covid-19 on IOT



**MANSI CHINTAKINDI**

B.E. (E&TC)

IOT technology offers developing markets the opportunity to fight COVID-19 effectively and most importantly to accelerate the digitalization of healthcare systems, plugging critical gaps in affordability, quality and access.

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<https://youtu.be/3vjKNmv-h8I>

The world is struggling with the COVID-19 pandemic; many technologies have been implemented to fight against this disease. There are hundreds of companies, employee currently at risk and the fact that many of these are tied to at-home quarantine network further complicates the situation. Internet Of Things (IOT) is being adopted by all the sectors like smart home, healthcare, agriculture and many more. IOT made life easy in this pandemic.

**Rise in IOT Adoption:** While IOT devices may be more vulnerable to attacks, adoption of this technology continues to rise steadily. This year, medical and healthcare industries aren't the only ones investing in IOT i.e touchless and contactless devices have become massively more attractive to businesses in industries ranging from hospitality to retail. Examples are touchless building access, touchless point-of-sale devices, and body temperature cameras.

**Roal of IOT in COVID-19:** Our goal is to

determine the role of IOT-based technologies in COVID-19 tracking and control & review platforms, applications architectures, and industrial IoT-based solutions combating COVID-19 in three main phases, including quarantine time, early diagnosis, and after recovery

There are some major IoT-enabled healthcare applications:

**Contact tracing:** As this virus has the potential to spread faster and gets



transmitted easily, it has become very important to find the people who have had contact with the affected person within the incubation period. In this regard, IOT devices have been very

## ... The Impact of Covid-19 on IOT

helpful. Wearable IOT devices such as smart watches and smart thermometers detect the number of persons affected by tracking their temperature, as fever is considered to be the first symptom of this disease.

So Using artificial intelligence (AI) and Big Data these data are then collected and analysed. By doing this, most affected areas can be confined from other areas, and proper methods for quarantine and isolation can be administered to efficiently control the spread of this virus.

**Sanitizing hospitals and affected areas using robots:** As we all know that Robotics plays an important role in maintaining hygienic conditions as well in medical field. Non-surgical robots can be used to sanitise and clean the rooms of the patient using UV-light, which is harmful to humans if exposed. Once this process is complete, the robot notifies the workers that the room is now safe to be used.

**Remote Monitoring:** Devices created to keep track of patients from their homes, remote IoT has been able to monitor chronic diseases of elderly patients that increase the risk of dying from the Coronavirus. Over \$65 million has been put into the budget for remote monitoring; \$5 million more than the

initial quarterly revenue expectation.

**Vaccine cold chain monitoring:** All vaccines must be stored within a specific safe temperature range. That's where vaccine cold chain monitoring comes into play. The chain starts from the time when the vaccine is being manufactured and ends to the point where the customer receives it.

Using the app which is connected to IoT sensors placed on the vaccine then it tracks the location, temperature and stock levels of vaccines, ensuring the supply is safe and reliable.

**Healthcare delivery drones:** IoT-enabled drones deliver medications and supplies to patients being cared for in the home instead of a hospital based setting. Drones are increasingly being tested for healthcare purpose around globe. Other types of drones played an active role in disinfecting public spaces or detecting COVID-linked symptoms.

During the COVID-19 pandemic, IoT technology has shown very encouraging results dealing with this disease. The IoT-related technologies and their implementations in three phases, including "Early Diagnosis" "Quarantine Time" and After Recovery. For each phase, the role of IoT-enabled / linked technologies including wearable, drones, robots, IoT buttons, and

## .... The Impact of Covid-19 on IOT

smartphone applications in combating COVID-19. IoT technology can be extremely efficient for this pandemic, but it is also critical to consider the privacy of data. By implementing IoT technology properly in a secure way, more patients, with peace of mind, can participate in their treatment using IoT devices. As a result, authorities and healthcare workers can better respond to pandemics. Consequently, the impact of these types of diseases, including infections, hospitalizations, and death rate, can be significantly reduced.



Q: Is Google male or female?  
A: Female, because it doesn't let you finish a sentence before making a suggestion.



## MANRS : Reduces Threats To Internet Routing



**Madani Bagwan**

B.E. (CSE)

As a user we use the internet just as a resource connected to the network and someone has to manage its provision in order to reduce routing attacks. MANRS is a global community which provides crucial fixes to minimize routing attacks.

Routing security is essential to Internet stability, which is constantly under a threat. In 2018, there were more than 12,000 routing attacks. These attacks have real-world impact and which cost failing to provide services to customers, to the potentially fatal cost of mitigation and response. Acknowledging this, a group of companies decided to take a serious action. From this, the Mutually Agreed Norms for Routing Security (MANRS) was initiated. MANRS objective is to reduce the most common threats to Internet routing through a program of technical action.

Routing Security MANRS provide a set of actions designed to help network operators to upgrade the security of the global routing system. Supported by the Internet Society, MANRS is a global initiative composed of like-minded network operators, IXP operators, and enterprises, with the intension of preventing route hijacking and certain kinds of DoS attacks. Network operators

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<https://youtu.be/ML5UPRecadk>

who are members of the MANRS have agreed to perform the following actions, designed to improve routing security.

**Filtering:** to make sure the correctness of their own announcements and of those from their customers to neighbour networks with prefix.

**Anti spoofing:** to permit source address validation for at least single-homed stub (customer) networks, their end-users, and their infrastructure.



**Coordination:** to maintain globally accessible, updated contact information.

**Global validation:** to publish their data, so others can evaluate routing information on a global scale.

## ... MANRS : Reduces Threats To Internet Routing

**OBSERVING ADHERENCE:** The MANRS Observatory measures a networks adherence to their readiness, which is an important indicator of the state of routing security. To measure MANRS readiness for a particular network a set of parameters is deployed, one for each action.

Let's take an example, to measure to what degree Filtering

**(Action 1)** is being applied, the number of routing incidents where the network was implicated, the duration is measured. Similar metrics are calculated for their anti spoofing competent

**(Action 2)** presence of contact information.

**(Action 3)** And completeness of routing information in public repositories.

**(Action 4)** All this data is gathered from trusted and believed third-party sources, including BGPStream.com, CIDR report, CAIDA Spoofer and RIPEstat. All this measurements are passive, which conclude that they don't require cooperation from a measured network. That allows MANRS to measure for members of the MANRS as well as for all networks over the Internet.

**ATTACK ACCESSORY:** The Internet networks have the strength to defend their prefixes. They can claim the prefixes allocated to them for inclusion in other

networks filters, and also build and apply such filters. One could argue that a network that published a prefix and doesn't defend it, or that propagates a prefix without verifying it, is a likely accessory to the attack.

It's therefore important that we can assess the strength and security of any network, building transparency and helping the Internet to grow ever stronger. The Observatory has two point of views: public (available to everyone) and private (available only to MANRS members). The public view user can look at the routing security metrics and statistics such as completeness of routing information.

MANRS participants can see performance of individual networks and even have a look for a detailed monthly incident report for their networks. Most of people say that networking is complex and also costly because it isn't protected.

MANRS is capable of verifiably identifying the prefixes and avoid them from being misused.

# Hyperloop



**Shubham Desai**  
B.E. (MECH)

Hyperloop is a new mode of transport that seeks to change this paradigm of transportation by being both fast and inexpensive

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<https://youtu.be/-wxqIAWiOzU>

BE ANYWHERE.  
MOVE ANYTHING.  
CONNECT EVERYTHING

As we know that transportation plays a key role in development of mankind.

But what if in case of emergencies we are not able to transport humans or goods faster? So, here's the way to transport anything faster as wind ironically in absence of air!

Have you ever wondered, transportation other than; vehicles, trains, aeroplane, ships...!!?

Yes, the fifth mode of transportation, the "HYPERLOOP".

### What is an Hyperloop?

Hyperloop is described as a sealed tube or system of tubes with low air pressure through which a pod may travel substantially free of air resistance or friction with both low and high speeds throughout the length of the tube. It could see passengers travelling at over 700 MPH i.e., 1126 KPH in floating pod

which races along inside giant low-pressure tubes, either above or below ground.

Hyperloop is a new mode of transport that seeks to be both fast and inexpensive for people and goods. History of Hyperloop.

Hyperloop concept was invented and designed in 1812 by the British Mechanical Engineer George Wengler. But there has been a resurgence in



interest in pneumatic tube transportation systems since the concept was reintroduced, using updated technologies, by Elon Musk after 2012.

## ... Hyperloop

### What it is made up of?

The tube is made of steel. Two tubes will be welded together in a side-by-side configuration to allow the capsules to travel both directions. The pressure in the tube is 100pa Sealed capsules carrying 28 passengers each that travel along the interior of the tube. The capsules are supported via air bearings that operate using a compressed air reservoir and aerodynamic lift. Linear accelerations are constructed along the length of the tube at various locations to accelerate the capsule.

Stators are located on the capsules via the linear acceleration Air is compressed with a pressure ratio of 20:1. Some air is stored for passenger and air bearing. An onboard water tank is used for cooling of the air.

### How does it Works?

Simply it has the same working principle of Air Hockey.

The pods would accelerate to cruising speed gradually using a linear electric motor and glide above their track using passive magnetic levitation or air bearings.

It is levitated and propelled forward using powerful electromagnets. This itself considerably reduces losses

due to friction, as the train is literally gliding over the track and is not in contact with the track. Hence there are no frictional losses allowing the train to move at high velocities. The absence of air in the hyperloop will further increase the efficiency by nearly eliminating losses due to air drag and make it much faster. The capsules are supported on a cushion of air, featuring pressurized air and aerodynamic lift.

The capsules are accelerated via a magnetic linear accelerator affixed at various stations on the low-pressure tube with rotors contained in each capsule. Residual air in the tube is captured, compressed, and forced through holes in skis attached to the bottom of the capsule. The gap between the skis and the tube during operation is between 0.5mm and 1.3mm.

The air pressure in the tube is very low, a capsule travelling at 700mph will cause significant air pressure at the nose of the vehicle, which must be considered in the design. Since the tube has a larger cross-section than the capsule, some air flows around the vehicle. Even so, compressor fans that actively transfer air from the front to the rear of the capsule must be installed.

### Specifications.

## ... Hyperloop

Height: 3.66 ft (1.1m)

Width: 4.50 ft (1.35m)

Passengers: 24-30

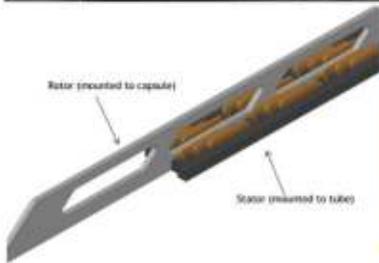
Speed: 760MPH (1236KPH)

The doors on each side will open in a gullwing (or possibly sliding) manner to allow easy access during loading and unloading and the luggage compartment will be at the front or rear of the capsule.

HyperloopProjects in India.

Hyper loop Transportation Technology signs a Historic Agreement with the Government

of the Indian State of Andhra Pradesh to connect the city centers of Amravati and Vijayawada.



Distance between Vijayawada to Amravati is 35km. Hyper loop will cover in 5 minutes.

Second project is in Maharashtra i.e., from Mumbai to Pune and estimated travel time is 25 minutes.

Third project connects Bangalore airport to the city in Karnataka.

As the Hyperloop is faster, cheaper, pollution free and is also resistance to earthquakes, no doubt it will be the most preferred way for transportation in the future.



## An Automatic Hand Sanitizer Dispenser



**Madhav Suttraway**  
S.E. (MECH)

A device dispensing a controlled amount of hand sanitizer and show Body Temperature using ATmega8A microcontroller.

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**YouTube**



<https://youtu.be/m5K4VALwXcY>

It is a device dispensing a controlled amount of hand sanitizer and show Body Temperature using ATmega8A microcontroller

Our initial point of contact with germs is often from the hands. Unfortunately, not many people wash or maintain basic hygiene of their hands. Over the time people have started emphasising more and more on maintaining personal cleanliness and hygiene.

And the best way to keep viruses and bacteria at bay is, of course, by frequent hand washing. Using a sanitizer dispenser for this reduces your chances of getting sick in your inevitable daily interactions with people and germs. Hand sanitizer dispenser also is handy in water-scarce areas.

Infrared thermometers or non-contact thermometers are gaining popularity these days because of their advantages. You can measure body temperature without bringing the device

in contact. So, the chances of infection and transferable diseases automatically get reduce In this case infrared thermometer are included in Hand sanitiser dispenser. This means both in one device.

### **How do automatic hand sanitizer dispenser work?**

The Ultrasonic sensor of the automatic hand sanitizer dispenser ATmega8A microcontroller detect the



with infrared energy that is emitted by one's body heat. When hands are placed in the proximity 8 CM of the sensor, the infrared energy quickly fluctuates. This fluctuation triggers the pump to activate

## ... An Automatic Hand Sanitizer Dispenser

and dispense the designated amount of sanitizer.

### How do infrared thermometers work?

An infrared thermometer has a lens that helps you focus on the desired object while infrared rays are used to measure the amount of heat generated by the body or an object. So, these thermometers can even be used to measure the temperature of dangerous objects or edible products during the processing stage that cannot be touched

Information of Circuit ATmega8A microcontroller are a programme there are multiple digital pins in this, the program is set in such a way that when the hand is within 8 CM then Digital pin 8 is a high then pump will start and dispense the hand sanitiser.

Four calculate the temperature using MLX90614 temperature sensor.

### Uses:

Germes are everywhere! They can get onto hands and items we touch during daily activities and make us sick. Cleaning hands at key times with soap and water or hand sanitizer that contains at least 60% alcohol is one of the most important steps you can take to avoid getting sick and spreading germs to those around you.

### COVID-19 precautions:

The do's and don'ts of using a hand sanitizer everyone should keep in mind (According WHO) Sanitize your hands whenever you touch any high-touch surface in a public space, such as doorknobs, Hand sanitizers have become a popular way of maintaining hand hygiene in situations where water and soap aren't available.

But even hand sanitizers come with their own complexities.

## the evolution of man and computer



## Industrial Safety



**Sanket Khamitkar**

B.E. (ELECTRICAL)

Lockout-Tagout (LOTO) is a technique used to prevent energy from being released during the servicing of equipment in every automobile industry, robotics line.

Scan / Click on QR Code to listen the article on

YouTube



<https://youtu.be/OhBzQEmweD0>

Hello everyone hope you are doing well. During this final year industrial training program I got wonderful opportunity to work in industry.

Every industry follows industrial safety rules refers to the management of all operations and events within an industry in order to protect its employees and assets by minimizing hazards, risks, accidents, and near misses. Industrial safety covers a number of issues and topics affecting safety of personnel and the integrity of equipment in a particular industry.

In this I'm going brief safety procedure that is LOTO. LOTO is a technique used to prevent energy from being released during the servicing of equipment in every automobile industry, robotics line.

### INTRODUCTION TO LOTO :

Lockout Tagout (LOTO) is a safety procedure that ensures that dangerous machinery and energy sources are

properly shut off and are not started up unexpectedly while maintenance or service work is being completed. Activating the equipment or power source before these tasks are complete puts the person maintaining or servicing it at risk.

Energy sources that should be locked out during maintenance could be Electrical, Mechanical, Hydraulic, Pneumatic, Chemical, Radiation, Thermal etc.



Lockout Tagout procedures ensure that the hazardous power sources are isolated and rendered inoperative for a given period of time or simply until maintenance work is complete.

## ... Industrial Safety

In most cases, a LOTO procedure involves two pieces of equipment:

- 1) A lock that will be secured to the power source and prevent it from being switched on.
- 2) A tag affixed to the locked device that cautions others not to attempt to use it.

### **PURPOSE:**

This procedure aims to prevent injury or risk of fatality to all employees and staff caused by the unexpected energizing, start-up or release of stored energy when working on equipment, machinery or systems. LOTO system programs to use energy isolating devices to disable machines or equipment's to prevent unexpected start up or release of stored energy that may cause injuries.

### **SCOPE:**

This procedure covers the servicing and maintenance of machines and equipment in which the unexpected energizing or start-up of the machines or equipment, or release of stored energy, could cause injury to employees & safety statement to protect all employees in South Pars field from the hazards of energy sources by the safe method of locking and tagging of isolated devices.

This document establishes minimum performance requirements for

the control of such hazardous energy for protection

### **REQUIREMENT FOR LOCKOUT/TAGOUT PROCEDURE**

Written lockout / tagout procedures specific to a particular machine or equipment, or to a similar grouping of machines or equipment, must outline the situations in which they are to be used, and the sequence in which they are to be used.

Lockout/tagout procedures shall clearly define the specific actions and responsibilities required during each of the following energy control sequences:

- 1) Preparation for shutdown
- 2) Equipment shutdown
- 3) Equipment isolation from the energy source
- 4) Application of lockout/tagout devices
- 5) Release of stored energy, de-energization
- 6) Verification of isolation
- 7) Release from lockout/tagout control once work is completed, including removal of lockout/tagout devices and restoration of energy to machinery / equipment.

### **LOCKOUT AND TAGOUT DEVICES:**

A combination of a lockout device and a tagout device shall be used for all

## ... Industrial Safety

lockable energy isolating devices. The lockout device (e.g. padlock) physically prevents the energizing of the machine or equipment. The tagout device (tag, sign) provides information about the nature of the lockout and warns workers to not operate the particular machine / equipment / device.

A tagout device is also used when an energy isolating device is not lockable, along with additional protective measures to ensure maximum worker protection.

Each worker involved in service or maintenance work must apply his/her own assigned personal lock, and carry his/her own key. Combination type locks or locks with master or duplicate keys must not be used.

### **REQUIREMENTS FOR ISOLATION OF MACHINERY/EQUIPMENT:**

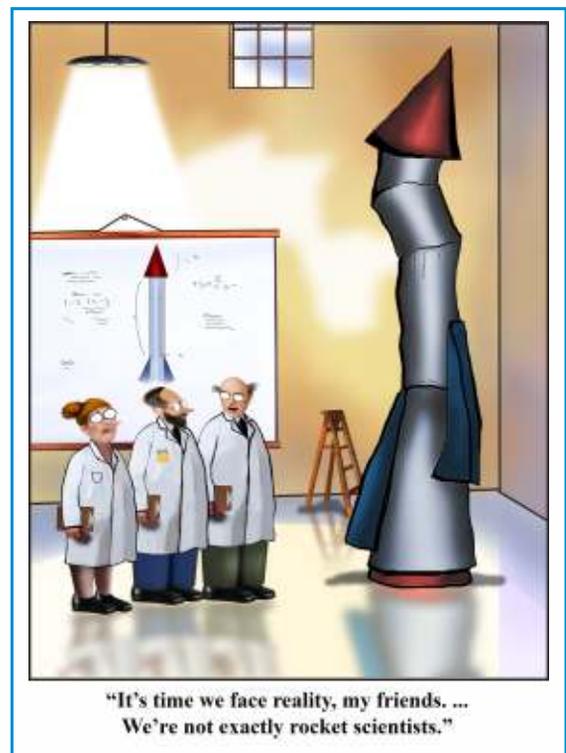
Where energy sources are present, instructions for the isolation and re-activation of machinery/equipment need to be developed for each piece of machinery/equipment as part of their safe work instructions (SWI).

The detail of the instructions will depend upon the identification and assessment of the hazards through the risk assessment process and consequential risks involved with each

piece of machinery/equipment.

It is essential that managers and supervisors carry out this assessment and put into place control measures including machinery / equipment isolation instructions before the machinery / equipment becomes operational.

Isolation points, which can be locked or tagged out, should be provided along the route of each potential energy source where practicable.



## Total Station



**Aniket Patil**

B.E. (CIVIL)

Total Station is an Optical instrument commonly used in construction, surveying and civil engineering. It is useful for measuring horizontal angles, vertical angles and distance-it does this by analyzing the slope between itself and a specific point.

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<https://youtu.be/ChbrBHT7638>

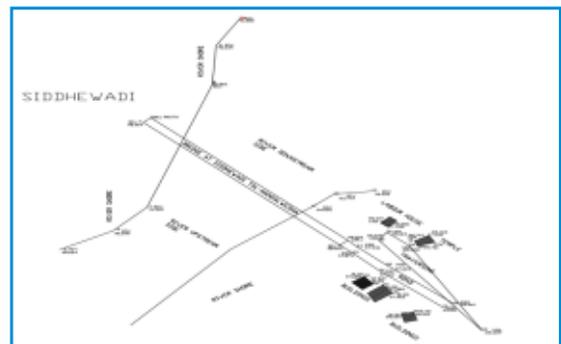
Today, advanced GPS receivers are improving the accuracy of positioning information, but in critical locations such as urban areas, the satellite availability is limited due to the signal blocking problem, which degrades the accuracy. For this reason, different methods of measurement are used.

Total stations is used extensively for taking geodetic and engineering survey measurements. These measurements are made possible by accurate observation of targeted points.

The land surveying is the technique of determining the three-dimensional points, distances and the angle between them. Traditionally, this has been done by using multiple tools like tape measurements, rulers. which will consume lot of time as well as effort. Hence, Total station is an efficient method for land surveying. It is one of the best method by which errors can be minimized.

### Introduction :

A total station is an electronic instrument for surveying. It is electric transit theodolite integrated with electronic distance measurement (EDM) to measure both vertical and horizontal angles and the slope distance from the instrument to a particular point on a board of computer to collect data and perform triangulation calculations.



### Advantages :

1. Field work can be carried out very fast.
2. Accuracy of the measurement is high.
3. Manual errors involved in reading and recording are eliminated.

## .... Total Station

4. Calculation of coordinates is very fast and accurate. Even corrections for temperature and pressure are automatically made.

5. Computers can be employed for map making and plotting contour and cross-sections. Contour intervals and scales can be changed in very less amount of time.

### **Limitations :**

1. The worker cannot observe the time because it complicates the work.
2. To perform the work completely its necessary to go back to the office and perform drawings with particular software.

### **Software :**

1. AutoCAD 2019
2. Microsoft Excel
3. Build Soft
4. Notepad

### **Procedure of Total Station :**

We visited the site Sidhewadi Pandharpur. we took the instruments and all accessories from MrKakane Sir who is a site Engineer from Awtade Construction Manglwedha.

First we mounted the total station on tripod stand and carry out its leveling by three foot screws. After completing the temporary adjustment, we plotted the stations on ground by prism rod.

Starting the traverse first we create a job & all requirement of

instrument such as North Magnitude and giving coordinates etc. after these we start to bisect the points which are marked on ground. the starting point is at the corner of the bridge at sidhewadi pandharpur. There are total 4 points recorded in the instrument.

After compiling all of the data we went for the analysis of these data at Manglwedha office to prepare the map and after analyzing the data in computer we connected all of the station in AutoCAD 2019 and prepared a print of this map.

### **Conclusion :**

1. Total station is an appropriate device for larger Construction site.
2. Total station can give readings in High temperature variation also.
3. This instrument can be operated easily.
4. Due to a smaller number of workers, errors can be minimized occurred by the operators.

## Sanskrit Informatic



**Laxmiprabha Annaldas**

S.E. (CSE)

The applications of computer in Sanskrit are evolving into new subject, which can be termed as Sanskrit informatics

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YouTube



<https://youtu.be/wYqEWD0rZM>

At present there are 102 billion 78 crore 50lakh words in Sanskrit dictionary. In Sanskrit the sentence is completed in the fewest words. According to United Nation Organization (UNO) 97% of the languages around the world are influenced by Sanskrit.

According to international Vedic Hindu University of America, " Sanskrit is the only language that uses all the muscles of the tongue to speak." Sanskrit language is regarded as an encyclopedia which consist so many knowledge and most valuable awareness in ancient period like Veda, Puranas, and scientific Fields etc. Sanskrit has a rich tradition of poetry and drama as well as scientific, philosophical and religious.

Even though the common language of computer is English some - where using their mother tongue in computer as a common language. Here have attention that some application of a computer is working by using Sanskrit language because eminent scholars said that Sanskrit is serviceable language in computer because the pattern of panini's

grammatical system is arranged as mathematical rules and regulations. In other way it is systematically arranged as binary system of computer language. So the role of Sanskrit in informatics and communication technology is unique.

The applications of computer in Sanskrit are evolving into a new subject, which can be termed as Sanskrit informatics.

Studies also proven that Sanskrit makes mind sharp and increases memory



power, that's why Sanskrit has been made compulsory in many schools in London and Ireland. Currently Sanskrit is taught in technical education courses in at least one university of more than 17

## ... Sanskrit Informatic

countries around the world.

The Systematic structure of this language is most helpful to use in computer. So, some researchers found that Sanskrit is the best language for use with computer. The vocabulary of Sanskrit is derived from the Vedas. There are many new knowledges of India is seen in compassions and treatises of Sanskrit mathematics, Astronomy and Advanced Technological Ares like Aero Nautical Engineering. All modern scholars said that the Sanskrit is an encyclopedia which consist of many various knowledges and even now almost knowledge resources is available in it.

Computer application to Sanskrit as well as developing programs to process Sanskrit in computers are developed by various department of the Government like center for development of advanced computing (CDAC) at Puna, TDIL under department of IT govt. of India, ILDC and other NGO's like CIRD, Academy of Sanskrit at Melkote etc." Technology Department of Indian Languages" is a major project Of DIT (Department of IT) and its aim were to develop information in Indian languages and develop technologies to access knowledge resource remaining in various Indian Languages including Sanskrit. There are various programs of computer system was developed by TDIL to motivate Sanskrit scholars and students.

They are able to use ICT tools and technology perfectly. Word processing, presentation, preparations, spread sheets preparation; web page surfing and designing, messaging etc. are the main work of Sanskrit. So there are many opportunity are for students and also most helpful to researchers can find out various subjects and topics in Sanskrit. India has seen amazing strides in almost all fields. All the same time the students are less aware about the bonding between Sanskrit and the computer and their usage.

The blindness about this topic is the main reason for it. Most of the students did not giving as much value to the Sanskrit, and also considered it as a specific region language for communication only it all due to the lack of resource to provide coherent information about the in estimated topic. All students should be bothered about our new technology and possibility of the information technology.

Here we have discussed the computer study in Sanskrit. Anyway, every field of knowledge especially technologically is focusing more difficult task in modern era.

# TECHNICAL SECTION

The image displays a virtual meeting interface with eight participants in a 2x3 grid. Each participant's video feed is accompanied by their name and a mute status indicator (a yellow dot). The participants are:

- Top-left: Vaibhav Patil (muted)
- Top-right: Ayan Shaikh (muted)
- Second row, left: Rageb Aleem Shaikh (muted)
- Second row, right: Shubham Waghmore (muted)
- Third row, left: Ajay Jakune (muted)
- Third row, right: Manasi Chintakindi (muted)
- Bottom row, left: Madani Bagwan (muted)
- Bottom row, right: Prof. Pawar. D. D. (muted)

At the bottom of the grid is a control bar with the following icons and labels from left to right: Stop Video, Invite, Manage Participants (with a '28' count), Polling, Share Screen, Chat, Record, Breakout Rooms, and More.

**AURA**  
CREATORS