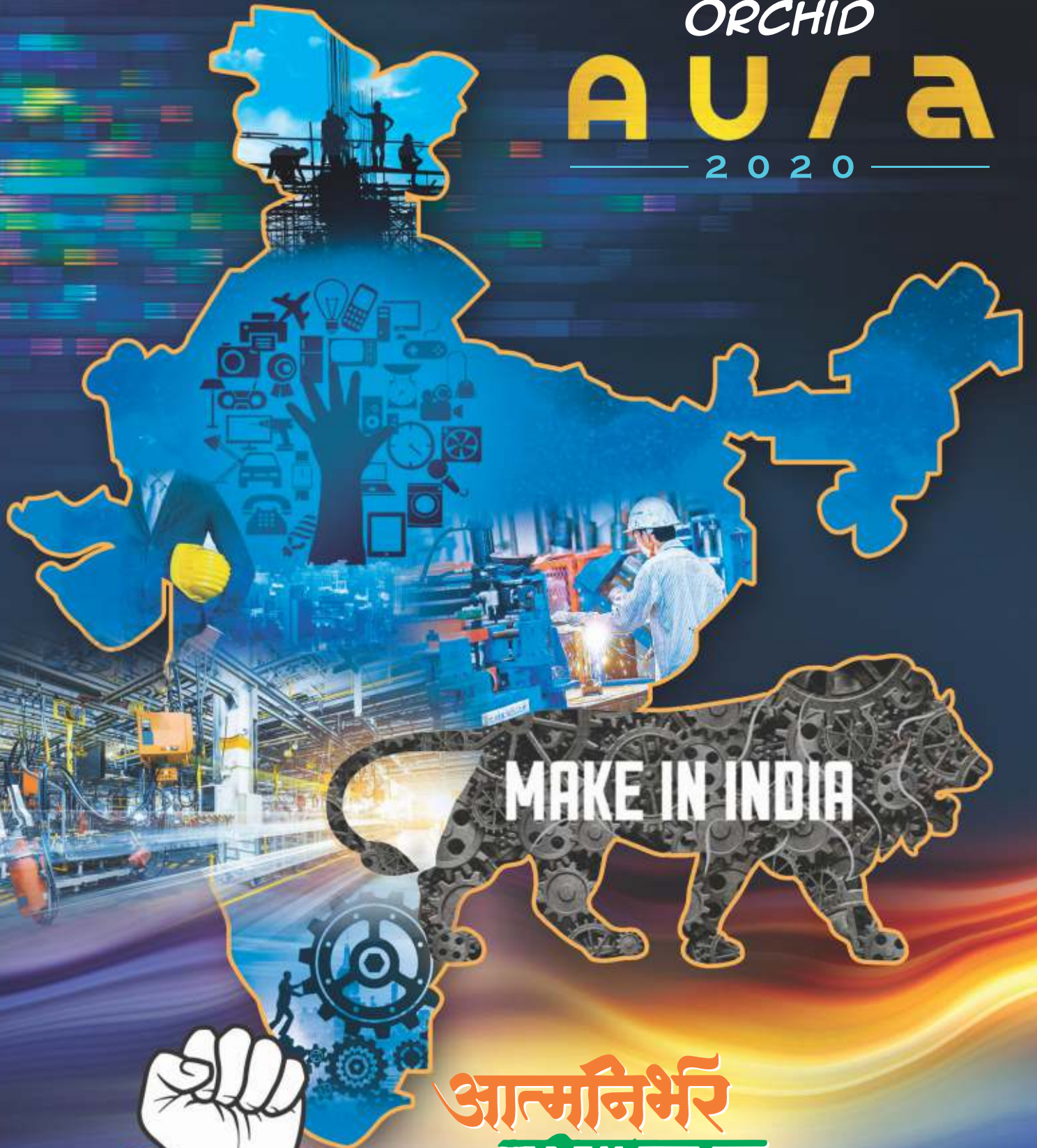


ORCHID

AUSA

2020



MAKE IN INDIA



आत्मनिर्भर
भारत

TECH NOCRAT

TECHNOCRAT

```
#selection at the end -add back the deselected mirror modifier object
mirror_ob.select= 1
modifier_ob.select=1
bpy.context.scene.objects.active = modifier_ob
print("Selected" + str(modifier_ob)) # modifier ob is the active ob
#mirror_ob.select = 0
from = bpy.context.selected_objects[0]
to = bpy.context.selected_objects[1]
from.data.objects[from.name].select = 1
```

AJK5545001J-3K

AD-58457-DJ

- Shaikh Rageb Aleem
- Vrushali Relekar





TechnoCrat is the society or group of Engineers which supports the Technology. So Indirectly the Engineers who research in technology are technocrat. This Section is dedicated to the newer Technology and Development ideas for the innovation by the TechnoCrat.

Over the year technology has impacted our world and created many amazing tools and resources by putting very useful information at our fingertips. Modern technology has provided us the advancement in lifestyle and quicker way to the communication. Day by day youth are attracted towards the advanced technology and trying to make it advance for the useful state of life.

Since there are so many new technologies to keep track of, it can seem overwhelming to adapt. Digital technology has changed the way of thinking and made advanced lifestyle. So with limitless need of technology the person should have to know how not to be addicted to easier life.

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Shoab Bagwan
BE CSE

IT and India

The IT industry in India has evolved into a technology powerhouse to be reckoned with and India is now emerging as an innovation and research hub.

The Indian IT industry has played a key role in putting India on the global map. Though the fast growth is slowing down due to automation, machine learning, growing competition, global trade dynamics et al however the contribution of IT/ITES sector remains to be around 8% to Indian GDP.

The Indian IT/ITES (Information Technology / Information Technology Enables services) industry earned revenue of over ₹131 billion during FY17. IT industry in India consists of two major components viz IT services and BPO (business process outsourcing). India is the world's largest sourcing destination, accounting for approximately 50% of the US\$ 185-190 billion market in 2017-18. The Indian IT and BPO industry, grew by 7.7% in FY17.

India has had a profound effect on the global software industry. From

modest beginnings in low-end activities like code-testing and bug fixing to new ideas and technologies, the IT industry in India has evolved into a technology powerhouse to be reckoned with and India is now emerging as an innovation and research hub. Indian companies have built a strong reputation for high standards of service quality and information security. The industry has played a significant role in transforming India's image from a slow moving bureaucratic economy to a land of innovative entrepreneurs and a global player in providing world class technology solutions and business services.

Exports are significant for the sector accounting for over 75% of the total revenue, and digital is the fastest growing segment within the sector. Refer the table below for the breakup around total revenue:



Things we should know:

- India has roughly 60-70 % cost saving over source countries. Total exports from the IT-BPM sector (including hardware) were estimated to have been €108 billion during FY18; exports rose at a CAGR of 12.26 % during FY09–18
- North America (60%) is the main exports destination followed by UK (18%), Europe (12%), APAC (7%) and rest of the world (>2%)
- Over 85 % of the total Indian IT-BPO exports is across four sectors viz. BFSI, telecom, manufacturing and retail.
- Indian IT &ITeS companies have set up over 1,000 global delivery centers in about 80 countries across the world.
- As of March, 2018 there were over 1140 GICs (Global In-house Centers) operating out of India
- Indian has the largest number of CMMi (Capability Maturity Model) level 5 companies in the world (roughly 70%).
- Indian technology and BPO sector is estimated to grow to €301 billion in by 2025.
- IT sector employs over 2 million

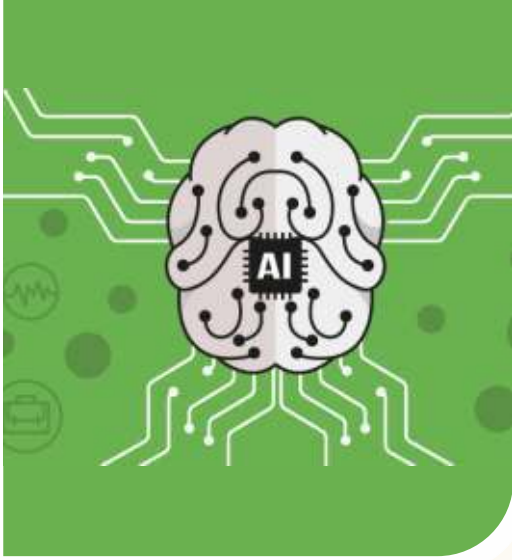
people directly and over 8 million indirectly.

- The 'digital' vertical is one of the fastest growing sector with 30% growth rate in 2017. It is further sub-divided into eight sub categories including Deal Websites (4%), games (1%), mobile (24%), social networking (2%), shopping (5 %), media and entertainment (6%), other e-Commerce sites (16%), marketplaces (40 %) and travel and leisure (2%).

Though US is traditionally the biggest market for Indian IT exports however as per recent NASSCOM (National Association of Software and Services Companies) report, Indian companies are now trying to explore the following potential countries for growth:

India IT companies are mostly spread in Bangalore, NCR, Hyderabad, Chennai, Mumbai, Pune and Kolkata. Around 55 % of the Indian product firms are in Bangalore and the NCR region.





Everything You Need to Know About AIOps



Balchandra Samleti
TE CSE

AIOps is the application of advanced analytics towards dynamic operations so that your IT Ops team can move at the speed that your business expects today.

What is AIOps?

AIOps is the application of AI for IT operations. It is the upcoming technology of ITOps, combining algorithmic and human intelligence to provide full visibility into the state and performance of the IT systems that businesses depend on.

Successful digital revolution relies on AIOps to enable IT to operate at the speed that modern business requires.

An AI Platform For The Next Decade Of IT

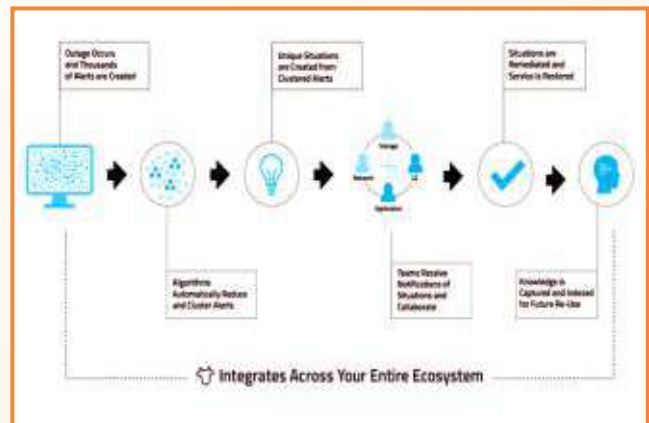
You can't manage today's active, constantly changing IT landscape with yesterday's tools.

The enduring progression of IT infrastructure models — moving from static and predictable physical systems to software-defined resources that change and reconfigure on the fly — demands equally dynamic technology

and processes for its management.

As network infrastructures evolve, old model-based systems take more and more effort to sustain, yet still fall further and further behind.

AIOps practices machine learning and data science to offer IT operations teams a actual understanding of any problems affecting the supply or performance of the systems under their care. [Gartner](#) first defined the term in 2016, positioning it at the intersection of monitoring, service desk, and automation.



6 feet



How Does AIOps Work?

AIOps works with current data sources, including traditional IT monitoring, log events, application and network performance glitches, and more. All data from these source systems are processed by a mathematical model that's ready to identify significant events automatically, without requiring laborious manual pre-filtering. A second layer of algorithms analyses these events to spot clusters of related events that are all symptoms of an equivalent underlying issue.

This algorithmic filtering massively reduces the background level that IT operations teams would otherwise need to affect, and also avoids the duplication of labor which will occur when redundant tickets are routed to different teams. Instead, virtual teams are often assembled on the fly, enabling different specialists to “swarm” around a problem that spans across technological or organisational boundaries. Existing ticketing and incident management systems can cash in on AIOps capabilities, integrating directly into existing

processes.

AIOps also improves automation, by allowing workflows to be triggered with or without human involvement. ChatOps capabilities makes existing automation and orchestration functionality available as an integral part of the traditional collaborative diagnostic and remediation process. As machine-learning systems become more and more precise and dependable, it becomes possible for routine and well-understood actions to be triggered without human intervention, potentially resolving issues before users are impacted or maybe conscious of any problem.



Industry 4.0



Rushikesh Dange
BE E&TC

Industry 4.0 also refers as IIoT or smart manufacturing, it deals with the physical production and operations with smart digital technology, machine learning, and big data

What is Industry 4.0?

Industry 4.0 is the digital transformation of manufacturing or production and related industries and value creation processes. Industry 4.0 is used interchangeably with the fourth industrial revolution and represents a new level in the organization and control of the industrial value chain. It also refers to a new phase in the industrial revolution that focuses heavily on the interconnectivity, automatic machine learning and real time data. Industry 4.0 also refers as IIoT or smart manufacturing, it deals with the physical production and operations with smart digital technology, machine learning, and big data to create digital technology, a more holistic and better connected ecosystem for companies that focuses

on manufacturing and supply chain manage while every company and organization operating today is different.

They all face a common the need for connected less and access to real time insights across processors, products and theirs where industry 4.0 plays role.

Industry 4.0 is not just about investing new technology and tools to improve manufacturing efficiency it is about revolutionizing the way your entire business operates and grows.

The product and manufacturing and production world in industry is changing day by day by bringing new technology and smart machines in the industry and hence labor work is going decreasing day by day and rate and quality of manufacturing increasing day



by day. To survive and have to develop well and have to be proper then you have to ready to invest in industry 4.0.

Evaluation of industry 4.0 :

Before going into depth of this industry 4.0. It is favorable rather we can say that it will be beneficial to understand first how manufacturing has been evolved since 1800s. There are four different revolutions of industry globe has experienced and continues to experience today.

1. First industrial revolution happened in between the late 1700s and 1800s. During the interval, manufacturing of products in industry is evolved by focusing on labor work performed by people and helped by work animals.
2. Second industrial revolution has started in the beginning or say earliest part of the 20th century and in this revolution the globe introduced the steel and use of electricity in production in the industry. The use of electricity improved the production rate,

quality of work and efficiency in the industry.

3. Third industrial revolution was started from 1950. In this revolution the industrial globe has made a different level of progress. They started to involve computer-technology and incorporation of more and more electronics in the industry. In this revolution they had put more concentration on digital technology and automatic working machine installed in their industry.

Fourth revolution of industry i.e. Industry 4.0: In the last few decades, a fourth industrial has prominent known as Industry 4.0. Industry 4.0 takes the special importance on the digital technology from recent decades to a whole new level using internet connectivity in the industry to connect the different departments and to their other branches, they also given the access to work on real time data and the introduction to the systems where integrations of computing and physical systems processes, Embedded computers and networks monitor and control the physical processes with



feedback loops where physical processes affects the computations and viceversa has large contents of scope, interlinked and holistic approach to manufacturing, it links physical with digital and allows access to different departments, attached to the industry, Industry 4.0 gives authority and power to business and better owner go better control and gives ability to handle the operation remotely each and every aspects regarding to their business and its operation. It gives permits to owner to boost rate of production, quality of work and drive growth of business

Benefits of Industry 4.0

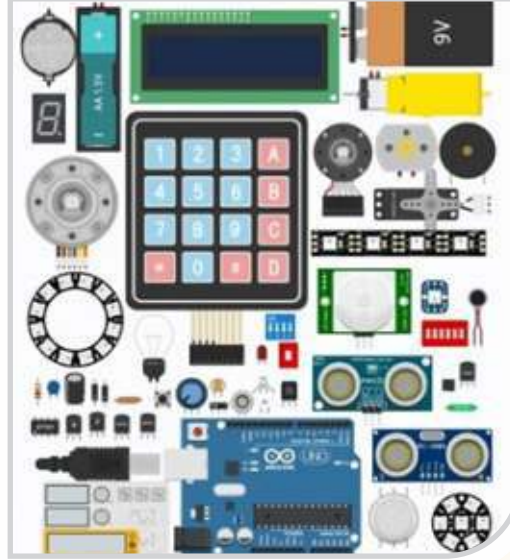
1. Industry 4.0 covers the entire product and life cycle of that product. Everyone related to this industry product gives information update, customer can share their views digitally kind of feedback.
2. This makes you more competitive. You have to implement such technologies and solutions related to your product supply chain that help

you to improvise and optimize the operation.

3. It makes you charismatic in terms of workforce. Younger and talented workperson willing to work in your industry. It makes you ease and user friendly work system.

This makes investor to invest in your company and add some profit to you. Industry 4.0 makes you to optimize all your aspects regarding to manufacturing process..





Design and Simulate Arduino Circuits for Projects in Lockdown



Yaseen Khan Dakhani
TE Electrical

Tinkercad has introduced an expansion to include circuits in its design capability called Tinkercad Circuits. This brings a whole new side to Tinkercad, revolving around simulating circuits with Arduino.

Most of our engineering projects where we either need to do automation, prototyping or to use IOT (Internet of Things) the ARDUINO is the first choice of the budding engineer. Let us see how to learn this hardware through virtual means and develop our skills in lockdown through TINKERCAD.

Tinkercad has introduced an expansion to include circuits in its design capability called Tinkercad Circuits. This brings a whole new side to Tinkercad, revolving around simulating circuits with Arduino. Tinkercad Circuits allows anyone to virtually create and program Arduino projects without the need for physical hardware. Let us see an example on how to use it, in this article I will show you how I completed the project in which we operate led by ultrasonic sensor.

Step 1: Setting up Tinkercad

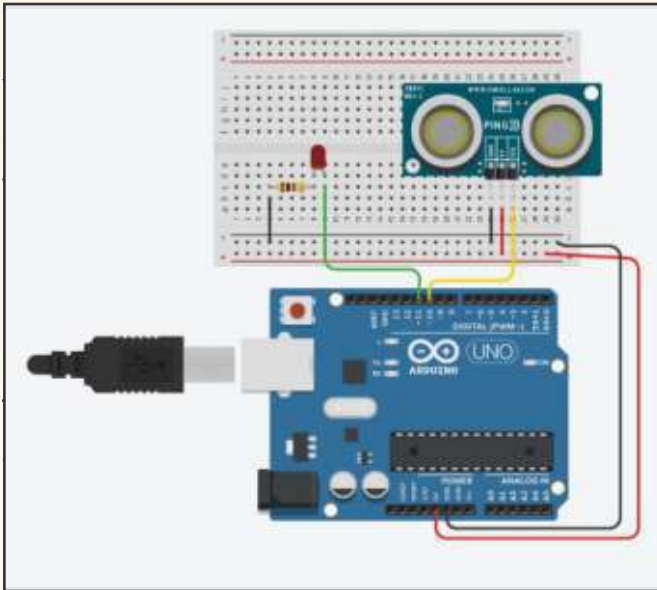
1. Visit <https://www.tinkercad.com>
2. Click on “Start Tinkering” button
3. Login with your social account like Google, Facebook, etc.
4. Click “Create a new circuit” button

Step 2: Making the Circuit

To start, we must build our circuit. You'll need a breadboard, an LED, an ultrasonic sensor, and the Arduino Uno.

1. Drag and drop these components into their respective places. To rotate them, you can use the hotkey “r”.
2. Follow the image and place each part as shown. Notice that the breadboard is used to connect the components together. It contains a series of columns and two rails on each side.





pin 10.

Once everything is in place, we can begin programming.

Step 3: Programming the Arduino

To begin, select “Code” from the top right toolbar, this will open the code block editor. The list of blocks is color-coded by type.

1. Create the first block, which is a variable block. This creates a placeholder for a value (input), which in this case is the reading we get from the ultrasonic sensor. To accomplish this, the block should read “set distanceRead to read ultrasonic distance sensor on trigger pin 10

echo pin same as trigger in units cm”.

2. Create the next block, an “if” statement, which is a type of control block that makes a decision. In our case, the decision is based on our distance reading. Our placeholder checks if the value is greater than 50 cm: “if distanceRead > 50 then”. If it is, what's inside the block is executed: “set pin 11 to HIGH”. This basically turns on the LED.
3. The last two blocks may seem



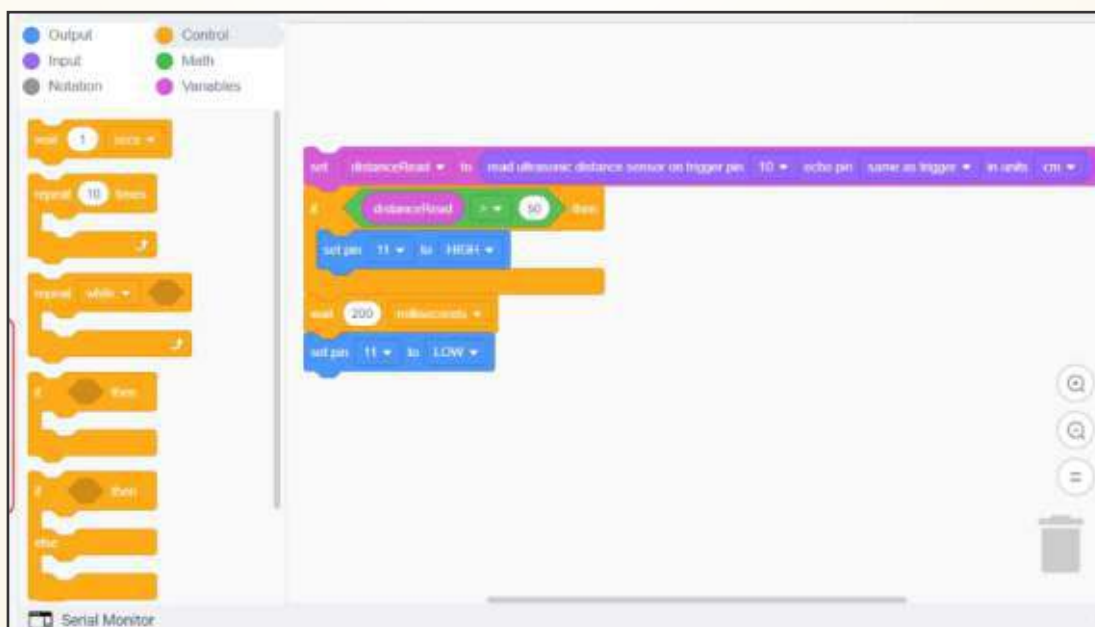
strange, but they make sense when you understand how an Arduino works. When it turns on, its program runs continuously in a loop, meaning you need to reset the LED for the next time it goes around. That's why the last output block turns our LED back off. And in order to see our LED blink, we have to place a small delay between loops. Implement this functionality with the first block set to “wait 200 milliseconds” and the second to “set pin 11 to LOW”.

Once you're done, select “Start Simulation” on the toolbar to turn on your Arduino Uno. To simulate an object in front of the ultrasonic sensor,

select it and drag the dot that appears. Watch how the LED responds to our predetermined limit.

Troubleshooting: If your program doesn't behave as expected, check your wiring and programming. Ensure that all pins are properly connected and that each block is written correctly.

If everything seems to work, congratulations! You can always continue to play around with the code and different components to learn more about how everything works.



The Breakthrough in Computing Power



Vaibhav Patil
TE E&TC

IBM's "Q" machine Quantum computers are already reinventing aspects of cyber security through their ability to interrupt codes and encrypt electronic communications.

Quantum computers can process massive and sophisticated data sets more efficiently than classical computers. They use the basics of quantum physics to hurry up the method of solving complex computations. Often those computations incorporate a seemingly unlimited number of variables, and therefore the potential applications span industries from genomics to finance. IBM's "Q" machine Quantum computers are already reinventing aspects of cyber security through their ability to interrupt codes and encrypt electronic communications. a number of the most important players in tech - including Google, Microsoft, Intel, IBM, and Alibaba - are exploring quantum computing for better cyber security and more, a symbol that subsequent big computing race is already underway.

While Google has been exploring quantum computing for ultra-fast internet search since a minimum of 2009, it remains to be seen who will emerge because the leader within the nascent commercial quantum computing industry.

A CHANGING COMPUTING LANDSCAPE

Before we will understand quantum computing and its applications, we must take a glance at how its predecessor - classical computing (transistor-based computing) - has reached its limits. Note, classical bits (stored on transistors) are the essential units of data processing during a classical computer. They're basically electronic on/off switches embedded in microchips that alternate between 0 or 1 to process information. The more



transistors on a chip, the faster the chip can process electrical signals, and therefore the better a computer becomes.

COMPUTING BEYOND MOORE'S LAW

In 1965, Intel co-founder Gordon Moore observed that the amount of transistors per sq. inch on a microchip had doubled per annum while the prices were cut in half. This observation is understood as Moore's Law. Moore's Law is critical because it means computers and computing power both get smaller and faster over time. However, Moore's law is slowing down, and consequently, classical computers aren't improving at an equivalent rate they want to Intel, unsurprisingly, has relied on Moore's Law to fuel chip innovation for the last 50+ years. Now, Intel, alongside other computer manufacturing giants, has suggested that transistor-based computing is approaching a wall. Sometime within the 2020s - if we would like to still reap the advantages of exponential growth in computing power - we'll need to find a fundamentally different way of processing information.

THE RISE OF QUANTUM COMPUTING

Quantum computers may provide a huge potency advantage for determination bound types of computations that stump today's computers — and would still stump them albeit Moore's Law were to carry on indefinitely. For starters, believe a phone book, then imagine you have a specific range to appear up in that phone book. A classical pc can search every line of the phone book, till it finds and returns the match. In theory, a quantum pc may search the total phone book outright, assessing every line at the same time and returning the result a lot of quicker than a classical pc. These issues, that need the best combination of variables and solutions, are usually known as optimisation issues. They're variety of the foremost advanced issues inside the globe, with probably game-changing advantages.

Imagine you are building the world's tallest edifice, and you've got got a permit the event instrumentation, raw materials, and labor, additionally as compliance necessities. The matter you'd wish to unravel is that the thanks



to confirm the optimum combination of kit, materials, and labor, etc. to maximize your investment. Quantum computing may facilitate suppose of those variables to help USA most with efficiency arrange for big comes.

Optimization issues are moon-faced across industries together with software package style, logistics, finance, web search, genomics, and more. Whereas the toughest optimisation issues in these industries stump classical computers, they are well-suited for being solved on a quantum machine.

Quantum computers disagree from classical computers in that improvement for the latter primarily depends on advancement inside the materials that structure transistors and microchips. Quantum computers do not utilize electronic switches. Instead, they use qubits. Qubits are the essential units for process info throughout a quantum pc.

TYPES OF QUANTUM COMPUTING

There are three primary sorts of quantum computing. Each type differs by the quantity of processing power (qubits) needed and number of

possible applications, also because the time required to become commercially viable.

QUANTUM ANNEALING

Quantum annealing is best for determination optimisation issues. In alternative words, researchers attempt to search out the only (most efficient) potential configuration among several potential mixtures of variables. For example, Volkswagen recently conducted a quantum experiment to optimize traffic flows at intervals the overcrowded town of Peiping, China. The experiment was run in partnership with Google and D-Wave Systems. The rule might with success cut back traffic by selecting the proper path for each vehicle, according to Volkswagen. Imagine applying this experiment on a worldwide scale - optimizing each airline route, landing field schedule, weather knowledge, fuel costs, and traveller info, etc. for everyone, to urge the foremost value economical travel and provision solutions. Classical ciphers would take thousands of years to compute the optimum answer to such a retardant. Quantum computers, in theory, will appear the fodder



a result of the quantity of qubits per quantum laptop will increase. Annealing applies to Associate in nursing array of trade issues. For example, airliner a worldwide region & Defence Corporation famed for developing military and business craft established a quantum computing unit at its Newport, Britain plant in 2015. The company is exploring quantum tempering for digital modelling and materials sciences. Whereas it presently takes engineers years to model the tactic of air flowing over Associate in nursing aircraft's wing, a quantum laptop might take simply some of hours to model each single atom of air flowing over a wing within the least angles and speeds to figure out the optimum or simplest wing style. Quantum annealing is that the smallest amount powerful and most narrowly applied variety of quantum computing. In fact, consultants agree that today's supercomputers will solve some optimisation issues on par with today's quantum annealing machines.

QUANTUM SIMULATIONS

Quantum simulations explore specific issues in physics that area unit

on the far side the capability of classical systems. Simulating advanced quantum phenomena may be one in all the foremost vital applications of quantum computing. One space that's significantly promising includes modelling the result of a chemical stimulation on an outsized range of subatomic particles — otherwise referred to as quantum chemistry. Above all, quantum simulators may be accustomed simulate biological process — one in all biochemistry's toughest issues. Misfolded proteins will cause diseases like Alzheimer's and Parkinson's, and researchers testing new treatments should learn that medicine cause reactions for every super molecule through the utilization of random pc modeling. It is aforesaid that if a super molecule were to achieve its properly folded configuration by consecutive sampling all the attainable drug-induced effects, it'd need a time longer than the age of the universe to gain its correct state. a sensible mapping of the biological process sequence would be a serious scientific and health care breakthrough that might save lives. Quantum reckons will



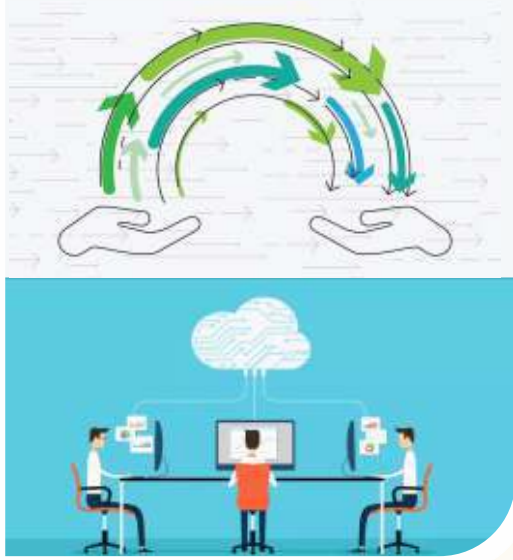
facilitate compute the huge range of attainable biological process sequences for creating simpler medications. Within the future, quantum simulations can change speedy psychoactive drug testing by accounting for each attainable protein-to-drug combination.

UNIVERSAL QUANTUM COMPUTING

Universal quantum computers area unit the foremost powerful and most typically applicable, however additionally the toughest to form. A really universal quantum laptop would probably build use of over one hundred thousand qubits — some estimates place it at 1M qubits. Keep in mind that these days, the foremost qubits we are going to access is not even 128. The basic plan behind the universal quantum laptop is merely that you just} simply might direct the machine at any massively complicated computation and acquire a quick answer. This includes determination the said annealing equations, simulating quantum phenomena, and more. Researcher's area unit coming up with algorithms for years that area unit

solely potential on a universal quantum laptop. The foremost well-known rules area unit Shor's algorithm for resolving numbers (to be used for advanced code breaking), and Grover's rule for quickly looking unstructured and huge sets of information. A minimum of fifty alternative distinctive algorithms area unit developed to run on a universal quantum laptop. Within the distant future, universal quantum computers might revolutionize the world of AI. Quantum AI might modify machine learning that is quicker than that of classical computers. Recent work has created algorithms that might act as a result of the building blocks of quantum machine learning, however the hardware and code to fully notice quantum AI area unit still as elusive to United States as a general quantum laptop itself.





The Open Source movement



Atharv Kherodkar
SE Electrical

Open source means other peoples can see and use your work and can share it freely. It gives you the power to build anything you want by collaborating with the community.

Open source is a movement for the creation, contribution, and for the sharing of life-changing content and software free of cost, where anyone can contribute in it to make it more impactful by collaboration and to make the world a better place.

What is open source?

The name itself gives an idea about its meaning, Open Source is one of the biggest moment of this century which is being executed from the past 20 years. Open source means other peoples can see and use your work and can share it freely. It gives you the power to build anything you want by collaborating with the community. In today's world every day, we come across many private limited and paid software that charges us monthly or annually for their services. In open-source, you don't need to pay money for any services provided by open-

source software.

By using Open source, you can see what happens to your computer and how it does it whenever you run open-source Applications or Software on your computer. You can check the source code of the same for learning and many other purposes, also you can contribute in it to improve it by introducing new features, suggesting some improvements in its structure for delivering better user experience. It gives you the ability to control and customize the software you're using, so it will do what you want and you change it anytime and anywhere to serve different purposes according to your need.

How to contribute?

The main motivation behind open source technology is to bring the greatest minds together to solve the problems faced by many peoples every



day, all around the globe. The platforms like GitHub are widely used by the maintainers of the open-source projects that allow people to contribute to their projects. In GitHub, you can check the source code of that software, and then and there you can contribute back to it. Pull request is the way to contribute to open source projects.

After writing some code, developing a feature, or after making some useful improvements in that project you can propose it to the original author of that project in the form of a pull request for the code to be pulled into the main project. Then author reviews and validates that code, and then merge it into the original project. After the merge, it becomes one of the features and the part of that application or software for everyone to use and everyone to build upon.

It allows you to learn with another person besides you having different skill-sets and knowledge even though you both might be worlds apart. It is the biggest opportunity to bridge the gap between developed countries like America and developing countries like India. It kind of brings all together to work on the same platform for the betterment of our future.

Advantages

It introduces a new way solve old problems and to share ideas and efforts.

You can form community around your project to make it better.

The impact of open source softwares is exponential.

You can create softwares free of cost.

It ends the competition between the developers.

Because of diverse groups working you get different voices and opinions.

You will see the problems you wouldn't have seen before.

It allows different types of perspectives to see the same problem that may not have been seen if it was closed.

You don't have to be perfect in everything to get access to incredible innovation.

Open source projects

Now a days a lot of people in the tech industry are getting into open source community. Most powerful and big sites are running open source softwares in their sites. 1/3rd of united states federal sites are up on opensource softwares including



whitehouse.gov. Big tech giants like Amazon, Google, Apple, Facebook, IBM, Wikipedia, etc. all use open source softwares and are part of many open source projects.

LINUX

Linux is the biggest project that contains many open source UNIX operating systems that are based on Linux kernel. It is named after its owner Linus Torvalds name which was honored as 17th most influential person of the century by Time Magazine. This kernel operating system was released by Linus Torvalds on 17th Sept 1991. This operating system is powered by the GNU project which was established to provide free softwares and mass collaboration announced by Richard Stallman in the year 1983 to give freedom and control to peoples over the use of computers.

You use Linux multiple times throughout the day and you don't even know about it. It is the world's most successful software and it is widely used in almost everything that you can think of. It runs most of the Internet. It runs your Smartphone, It is in your cars and televisions. It runs banks and most of the global economy. It is used in air-traffic control systems, nuclear

submarines, etc. The most beautiful thing about this software is that it is owned by everyone using it, and anyone can use it without any cost.

Most popular Linux Distributions :

- Ubuntu
- Linux Mint
- Debian
- Open-SUSE
- Arch Linux
- Kali Linux
- Fedora
- Dee-pin
- Cent-OS
- Zorin

Mozilla Firefox

Mozilla Firefox is a rising web Browser that was founded by Netscape Communication Corporation in the year 1998, due to the open-source movement that's going on from past 2 decades or more in this world. It is one of the largest and popular open source project on the web. Mozilla's MOSS (Mozilla Open Source Support), allows coders and developers to contribute in this software. You can also contribute in this project using GitHub because most of the source codes of number of tools and services of Mozilla Firefox are hosted on it.

You can also contribute through



Mozilla's Mercurial servers such as Mozilla Central. Mozilla also awards open source project that contributes in Mozilla and in the betterment of the future Internet. Mozilla Firefox has jumped at the second place in worldwide Net Market Share in April 2020 with 7.75% of worlds users, right after Google Chrome (69.18%) and before Safari (3.94%).

Google Chrome

Google Chrome is the most popular and widely used web browser in present time. Initially was started as open source project, called Chromium, most of its source code comes from open source project chromium but it is licensed as proprietary freeware. Google chrome is the developed by the collaboration of most diverse group of peoples all over the world who contributed to this software frequently without getting paid and not charging any money for the services of this software. Chromium allows each and every individuals to contribute in this project openly of their time, talents and their skill-sets.

Some other open source projects are:

WordPress
VLC

Magneto
Tor
Tails
Secure-Drop
Caddy
Gobot
NVDA

Open source community

On this platform anyone can just put an idea in the form of source code and allows all to make modifications in it and community can be formed around it for making that code better.

Whenever you have diverse group of people working on a single project, you can reinvent your project and can invent new opportunities in it due to the different opinions and suggestions you can get by different perspectives. Open source also gives you advantage is you can see the same problem from different angles by number of people in community that produces different ways to solve the same problem and it creates new possibilities of the use of that project.





5G Technology



Shruti Vernekar
BE E&TC

5G is the next step beyond 4G and LTE mobile networking with faster speeds, more bandwidth, and wider range. There are several companies within the mobile ecosystem that are contributing to bringing 5G to life.

In this generation, people were giving more importance to time. Suppose if it takes more time for downloading small videos, people get irritated. In this current scenario, users use more and more gadgets such as smart phones for accessing various internet facilities and applications. The user spends lots of time online so; there is a need for high-speed internet connectivity. 4G Communication technology has a peak speed specification of 1Gb per second, with maximum download speed of 12 Mbps and maximum upload speed of 5 Mbps. On the other hand 5G download is likely to achieve speeds that are 20 times faster than 4G.

5G is the next step beyond 4G and LTE mobile networking with faster speeds, more bandwidth, and wider range. There are several companies within the mobile ecosystem that are

contributing to bringing 5G to life. A multinational company, Qualcomm, has played a major role in inventing the many foundational technologies that drive the industry forward and make 5G, the next wireless standard. 5G network is a cellular network, in which the service area is divided into a small geographical area called cells. All 5G wireless devices in a cell are connected to the internet and telephone network by radio waves through a local antenna in the cell. 5G uses OFDM (Orthogonal frequency division multiplexing), this method is used to reduce the interference of signal in channel. The main advantages of the new network are that they will have greater bandwidth, giving higher download speeds, eventually up to 10Gbit/s. 5G is designed to not only deliver faster, better mobile broadband services compared to 4G LTE, but can also



expand into new service areas such as mission-critical communications and connecting the massive IoT. 5G is designed to do a variety of things that can transform our lives, including giving us faster download speeds, low latency, and more capacity and connectivity for billions of devices. For example, with 5G, you can access new and improved experiences including near-instant access to cloud services, multiplayer cloud gaming, shopping with augmented reality, and real-time video translation and collaboration, and more. The significant growth in the urban population is expected to drive sustainability, resource conservation, economic & technology development initiatives. Cities will evolve to attract and retain investments, business, residence and visitors. Ecosystem will adopt and cross industry application such as connected vehicles, smart grids, connected healthcare and connected workforce, etc.

5G is used across three main types of connected services, which are enhanced mobile broadband, mission-critical communications, and the massive IOT.

1. Enhanced mobile broadband: In addition to making our smart

phone better, 5G mobile technology can usher in new immersive experiences such as VR and AR with faster, more uniform data rates, lower latency, and lower cost-per-bit.

2. Mission-critical communication: 5G can enable new services that can transform industries with ultra-reliable, available, low-latency links like remote control of critical infrastructure, vehicles, and medical procedures.

3. Massive IOT: 5G is meant to seamlessly connect a massive number of embedded sensors in virtually everything through the ability to scale down in data rates, power, and mobility providing extremely lean and low cost connectivity solutions.

Is 5G available now? Yes, 5G is already here today, and global operators have started launching new 5G networks in early 2019. 5G mobile networks are expected to be available nationwide in many countries by 2020. Also, all major Android phone manufacturers are commercializing 5G phones. And soon, even more people may be able to access 5G, which is expected to change the way people and things are connected to each other.

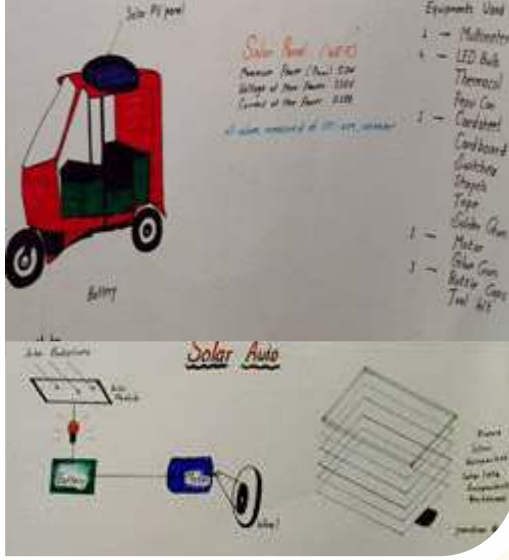


Solar Electric Vehicle

Solar Energy Is The Energy Acquired Direct From Sun And Converted Into Electrical Energy. Sun Energy Have Perpetual Life Time Period. Although It Increases Or Decreases But This Energy Is Unlimited It Never Ends.



Rohini Kakade
SE Electrical



If our world of organisms i.e. Earth, our life, assume it has beautiful i.e. Pollution free life. And yes! Pollution free air in our life is possible. That pollution which causes many diseases of organisms, that pollution which causes blurred to eyes, we can keep aside that pollution.

Almost many people know about electric vehicle and they know how e-vehicles are reduces the air pollution and also many advantages. This can improve our way of living life. Living pollutionfree, it to improve our lifestyle.

So, we are trying to live non – polluting. We started using e-vehicles ,afterwe observed that while using e-vehiclesit getting some limitation it is eco-friendly but it don't have that much energy source i.e. Electricity.

To overcome that problem we can see towards the solar energy as an essence of electrical energy.

Solar energy is the energy acquired direct from sun and converted into electrical energy. Sun energy have perpetual life time

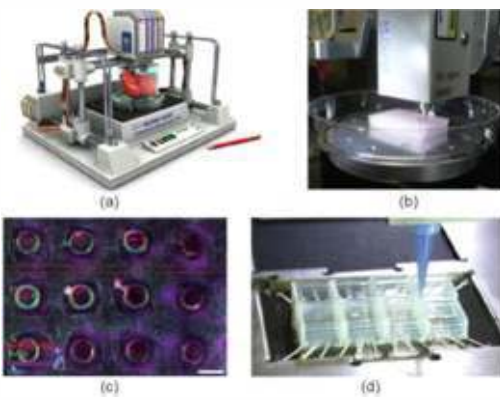
period. Although it increases or decreases but this energy is unlimited it never ends. Hence, solar energy will be best option to manage electrical energy for e-vehicles.

And i am rohini kakade and my fellows satish adam, shubham aigole, nitish miranam,and ishwarkonda. We have worked for e-vehicles based on solar energy. In which we created model of e-vehicles. Which include the two important equipment's i.e. Solar panel for creating electricity from solar energy and batteries for electricity storing purpose. By adding this two equipment's in e-vehicles it overcomes to the problems that limitation of electricity.

This model is created with new modifications in present e-vehicles and utilization of solar energy for electrical form,while we have it in abundant amount. Solar pv system may have expensive at the initial period, but it may most efficient as we use for long time afterbuying. Hence for more eco-friendly life, the use of solar e-vehicles will be settle efficient and more reliable.



On the Road to 3-D Printed Organs



Sheela Jadhav
TE CSE

3-D printer was developed in the late 1980s. It could print small objects designed using Modeling Software.

For years, scientists have predicted that 3-D printing-which has been used it to make toys, homes, scientific tools and even a plastic bunny that contained a DNA code for its own replication-could one day be harnessed to print live, human body parts to mitigate a shortage of donor organs. So far, researchers also used 3-D printing in medicine and dentistry to create dental implants, prosthetics, and models for surgeons to practice on before they make cuts on a patient. But many scholars have moved beyond printing with plastics and metals-printing with cells that then form living human tissues.

No one has printed entirely functional, transplantable human organs just yet, but experts are getting closer, making pieces of tissue that can

be used to test drugs and designing methods to overcome the challenges of recreating the body's complex biology.

Initially 3-D printer was developed in the late 1980s. It could print small objects designed using CAD Software. A design would be virtually cut into layers only three-thousandths of a milli metre thick. Then, the printer would piece that design into complete product. There were two main strategies a printer might use to lay down the pattern: it could extrude a paste through a very fine tip, printing the design starting with the bottom layer and working upward with each layer being supported by the previous layers.

When it comes to printing cells and bio-materials to make copies of body parts and organs, these same two



strategies apply, but the ability to work with biological materials in this way has required input from cell biologists, engineers, developmental biologists, materials scientists, and others.

So far, scientists have printed mini organoids and micro-fluidics models of tissues, also known as organs on chips. Both have yielded practical and theoretical insights into the function of the human body. Some of these models are used by pharmaceutical corporations to test drugs before moving on to animal studies and eventually clinical trials. For e.g., printed cardiac cells on a chip and linked it to a bio-reactor before using it to test the cardiac toxicity of a well-known cancer drug, doxorubicin. The team showed that the cells beating rate decreased dramatically after exposure to the drug.

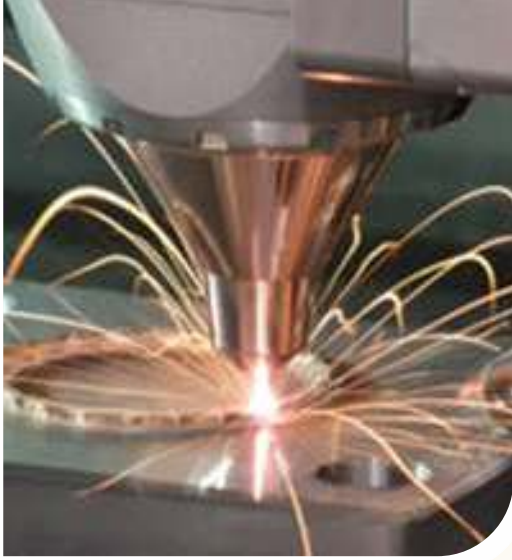
However, scientists have yet to construct organs that truly replicate the myriad structural characteristics and functions of human tissues. There are a number of companies who are attempting to do things like 3-D print

ears,” and researchers have already reported transplanting 3-D printed ears on children who had birth flaws that left their ears immature.



To put it very simply, the process of 3D organ printing uses the patient's own tissues. Doctors or researchers harvest a small subsection of healthy tissue that they then use to expand the cells outside of the body. Those cells are used to produce new tissues and organs that can then be placed back into the bottom. It is a little more complex than that, though. Bioprinting is done like this. Specialized scientists harvest cells from biopsies or stem cells. These living cells are then placed in a petri dish and allowed to multiply. The mixture that results – somewhat of a biological ink – is fed into a 3D printer. The printer is programmed to arrange different cell types and materials into a specific three-dimensional shape. Once the organs are printed, doctors hope that they will integrate with existing tissues already within the body.





What is Hybrid Manufacturing?



Shaikh Rageb Aleem
TE CSE

it is an additive manufacturing process, but to build over pre-existing components manufactured from the same base metal or different metals.

The simplest way to understand hybrid manufacturing is as a combination of additive processes 3D printing, known in the context of production as additive manufacturing (AM) and subtractive processes, such as milling. While there are plenty of parts being made through some combination of these processes and more are being introduced all the time the crucial qualifier for hybrid manufacturing is that both processes occur on the same machine.

Components usually suffer from wear, distortion, defects and cracks during their life cycle, and sometimes repairing is considered most cost effective and time saving than replacing these components. For a complex geometry, especially aerospace components, the repair process gets more complicated, and the traditional repair methods cannot be used for.

Since the additive technologies are used in repair and the term “Additive Repair (AR)” as “additive manufacturing process for reconstruct and modify pre-built components”. So, it is an additive manufacturing process, but to build over pre-existing components manufactured from the same base metal or different metals. Additive manufacturing technology can be found in applications like laser repair and laser freeform manufacturing.

Hybrid Machining Formats & Processes:

Although the overall number of available hybrid machines is still relatively small, it's helpful to divide them into several types. The most basic distinction to draw is between off-the-shelf hybrid machines and additive modifications for conventional machine tools. Although hybrid add-ons are designed to be purchased and installed



independently, some machine tool builders are starting to offer them as standard options, including ELB-Schliff, Mazak and Mitsui Seiki, in HMT's case. 3D-Hybrid Solutions' founder, Karl Hranka, confirmed that his company is on the same path.

Beyond this basic distinction, the available options for hybrid manufacturing can also be divided in terms of their underlying additive technologies. These include directed energy deposition (DED), wire-arc additive manufacturing (WAAM), cold spray (CS), ultrasonic additive manufacturing (UAM) and powder bed fusion. There are important differences between these technologies, and the manufacturers of hybrid machine tools have each placed their bets, so to speak, so it's worth looking at these technologies in more detail.

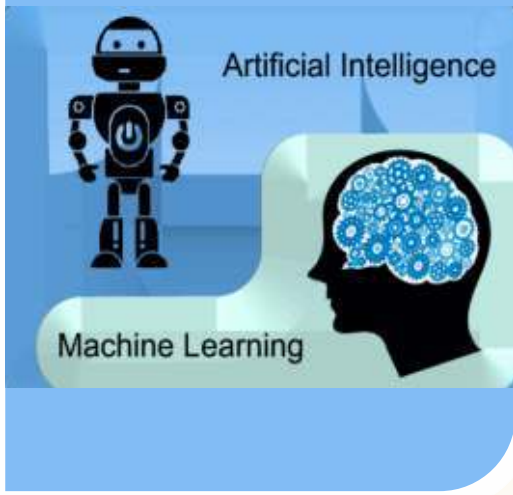
It is the designer's responsibility to ensure that a machine part is safe for operation under reasonably expected conditions. All design approaches must verify the relationship between the applied stresses on a part and the strength of its metal. By taking all the advantages of the additive manufacturing process, and specifying all of its capabilities and constraints, the

designing process can be modified by AM technologies. The objective of this design process approach is to define a methodology to design the damaged volume of parts by taking the advantage of additive manufacturing abilities. In the early design phase, the engineer has to make a design concept for the missing volume of the damaged part. Hence, he need some solutions principals, methods and tools to help in embodiment the design.

Hybrid Machines vs Standalone 3D Printers

When it comes to hybrid machine tools, the obvious question to ask is whether merging additive and subtractive processes in a single machine is really necessary. Given that we already have plenty of standalone subtractive options, more standalone metal additive options cropping up all the time, and pallet-changing systems galore, what's the benefit of putting it all in one machine (aside from obvious added floor space)?





Artificial Intelligence and Machine Learning



Mayuri Rathod
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Artificial intelligence (AI) traditionally refers to an artificial creation of human like intelligence that can learn, reason, plan, perceive, or process natural language.

Artificial intelligence (AI) has received increased attention in recent years. Innovation, made possible through the Internet, has brought AI closer to our everyday lives. These advances, alongside interest in the technology's potential socioeconomic and ethical impacts, brings AI to the forefront of many contemporary debates. Industry investments in AI are rapidly increasing, and governments are trying to understand what the technology could mean for their citizens.

The collection of “Big Data” and the expansion of the Internet of Things (IoT), has made a perfect environment for new AI applications and services to grow. Applications based on AI are already visible in healthcare diagnostics, targeted treatment, transportation, public safety, service robots, education and entertainment, but will be applied in more fields in the

coming years. Together with the Internet, AI changes the way we experience the world and has the potential to be a new engine for economic growth.

Current Uses of AI:

Although artificial intelligence evokes thoughts of science fiction, artificial intelligence already has many uses today, for example:

Email filtering: Email services use artificial intelligence to filter incoming emails. Users can train their spam filters by marking emails as “spam”.

Personalization: Online services use artificial intelligence to personalize your experience. Services, like Amazon or Netflix, “learn” from your previous purchases and the purchases of other users in order to recommend relevant content for you.

Fraud detection: Banks use artificial intelligence to determine if there is strange activity on your



account. Unexpected activity, such as foreign transactions, could be flagged by the algorithm.

Speech recognition: Applications use artificial intelligence to optimize speech recognition functions. Examples include intelligent personal assistants, e.g. Amazon's "Alexa" or Apple's "Siri".

Artificial Intelligence—What it's all about

Artificial intelligence (AI) traditionally refers to an artificial creation of human like intelligence that can learn, reason, plan, perceive, or process natural language.

Artificial intelligence is further defined as "narrow AI" or "general AI". Narrow AI, which we interact with today, is designed to perform specific tasks within a domain (e.g. language translation). General AI is hypothetical and not domain specific, but can learn and perform tasks anywhere. This is outside the scope of this paper. This paper focuses on advances in narrow AI, particularly on the development of new algorithms and models in a field of computer science referred to as machine learning.

Machine learning – Algorithms that generate Algorithms

Algorithms are a sequence of instructions used to solve a problem. Algorithms, developed by programmers to instruct computers in new tasks, are the building blocks of the advanced digital world we see today. Computer algorithms organize enormous amounts of data into information and services, based on certain instructions and rules. It's an important concept to understand, because in machine learning, learning algorithms not computer programmers create the rules.

Instead of programming the computer every step of the way, this approach gives the computer instructions that allow it to learn from data without new step-by-step instructions by the programmer. This means computers can be used for new, complicated tasks that could not be manually programmed. Things like photo recognition applications for the visually impaired, or translating pictures into speech.

The basic process of machine learning is to give training data to a learning algorithm. The learning algorithm then generates a new set of rules, based on inferences from the data. This is in essence generating a new algorithm, formally referred to as



the machine learning model. By using different training data, the same learning algorithm could be used to generate different models. For example, the same type of learning algorithm could be used to teach the computer how to translate languages or predict the stock market.

How machines learn:

Although a machine learning model may apply a mix of different techniques, the methods for learning can typically be categorized as three general types :

Supervised learning: The learning algorithm is given labeled data and the desired output. For example, pictures of dogs labeled “dog” will help the algorithm identify the rules to classify pictures of dogs.

Unsupervised learning: The data given to the learning algorithm is unlabeled, and the algorithm is asked to identify patterns in the input data. For example, the recommendation system of an e-commerce website where the learning algorithm discovers similar items often bought together.

Reinforcement learning: The algorithm interacts with a dynamic environment that provides feedback in terms of rewards and punishments. For example, self-driving cars being rewarded to stay on the road

Why now?

Machine learning is not new. Many of the learning algorithms that spurred new interest in the field, such as neural networks, are based on decades old research. The current growth in AI and machine learning is tied to developments in three important areas:

Data availability: Just over 3 billion people are online with an estimated 17 billion connected devices or sensors. That generates a large amount of data which, combined with decreasing costs of data storage, is easily available for use. Machine learning can use this as training data for learning algorithms, developing new rules to perform increasingly complex tasks.

Computing power: Powerful computers and the ability to connect remote processing power through the Internet make it possible for machine-learning techniques that process enormous amounts of data.

Algorithmic innovation: New machine learning techniques, specifically in layered neural networks—also known as “deep learning”—have inspired new services, but is also spurring investments and research in other parts of the field.

Key Considerations



As machine learning algorithms are used in more and more products and services, there are some serious factors that must be considered when addressing AI, particularly in the context of people's trust in the Internet:

Socioeconomic impacts. The new functions and services of AI are expected to have significant socioeconomic impacts. The ability of machines to exhibit advanced cognitive skills to process natural language, to learn, to plan and to perceive, makes it possible for new tasks to be performed by intelligent systems, sometimes with more success than humans. New applications of AI could open up exciting opportunities for more effective medical care, safer industries and services, and boost productivity on a massive scale.

Transparency, bias and accountability. AI-made decisions can have serious impacts in people's lives. AI may discriminate against some individuals or make errors due to biased training data. How a decision is made by AI is often hard to understand, making problems of bias harder to solve and ensuring accountability much more difficult.

New uses for data. Machine learning algorithms have proved

efficient in analyzing and identifying patterns in large amounts of data, commonly referred to as "Big Data". Big Data is used to train learning algorithms to increase their performance. This generates an increasing demand for data, encouraging data collection and raising risks of over sharing of information at the expense of user privacy.

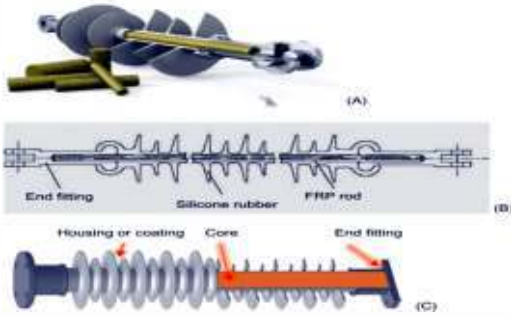
Security and safety. Advancements in AI and its use will also create new security and safety challenges. These include unpredictable and harmful behavior of the AI agent, but also adversarial learning by malicious actors.

Ethics. AI may make choices that could be deemed unethical, yet also be a logical outcome of the algorithm, emphasizing the importance to build in ethical considerations into AI systems and algorithms.

New ecosystems. Like the impact of mobile Internet, AI makes new applications, services, and new means of interacting with the network possible. For example, through speech and smart agents, which may create new challenges to how open or accessible the Internet becomes.



Composite Insulators



Vijay Sonawane
BE Electrical

Composite insulators have been introduced as a good alternative to ceramic and glass insulators. Composite insulators can take wind and rain and have good self-cleaning performance under wind and rain

Composite insulators have been introduced as a good alternative to ceramic and glass insulators. Composite insulators can take wind and rain and have good self-cleaning performance under wind and rain, so need checking for pollution only once every 4–5 years, and requiring less time for the repair and power interruption.

Composite insulators consist of at least two insulating materials; one of which is the task of providing electrical properties and the other providing mechanical properties. A composite insulator is made of at least two insulating parts – a core and housing. It is equipped with end fittings.

Composite insulator consist of the following components in the construction

◆ Core:

The core is the internal insulating part of a composite insulator. It is intended to carry the mechanical load. It consists mainly of glass fibers positioned in a resin matrix so as to achieve maximum tensile strength.

◆ Housing :

The housing is external to the core and protects it from the weather. It may be equipped with weather sheds. Some designs of composite insulators employ a sheath made of insulating material between the weather sheds and the core. This sheath is part of housing.

◆ Weather sheds:

Weather sheds are insulating parts, projecting from the housing and sheath, intended to increase the leakage distance and to provide an interrupted path for water drainage.



◆ End fittings:

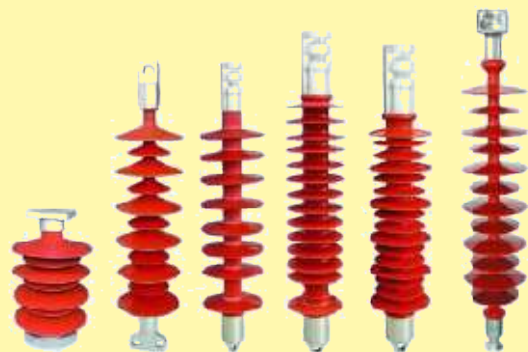
End fittings transmit the mech. load to the core. They are usually made of metal.

•The specific advantages of composite insulator

- Light weight, and lower construction and transportation costs.
- Vandalism resistance, less gunshot damage.
- High strength to weight ratio, longer span / new tower.
- Better contamination performance.
- Improved transmission line aesthetics.
- Hydrophobicity of insulator surfaces.
- Disadvantage of composite insulator Composite insulators:
- The higher price of raw materials as compared to other insulators.
- The lack of experienced labor.



Composite insulators can take wind and rain and have good self-cleaning performance under wind and rain, so need checking for pollution only once every 4–5 years, and requiring less time for the repair and power interruption. Since the core rod has higher extension strength, composite insulators can result in very light overall weight. Their weight is only 10–20% of the weight of porcelain insulator strings of the same voltage class. Their length can be shortened by more or less 10% in the same voltage class, which can greatly reduce the labor of workers in transportation and field operation.





***We Salute the
Corona Warriors***

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