Innovative young minds on fire

Writing a technical article that can be published in a magazine, conference or journal is a challenging undertaking. Witness our dreamers thinkers and doers trying to share their knowledge of a technology, project or software they are excited about.

LET ME ASSIST YOU

Nakulesh Jayakrishnan, TE Computer

Imagine an assistant as powerful and as intelligent as Tony Stark's JARVIS. Exciting, right? The possibilities would be endless. If it existed, we would not have any real human friends. Maybe, we did be able to craft our own super-power suit, provided the individual possesses the smartness and funds required for it. Maybe even a time-travelling terminator-like robot in the future. Seems impossible, doesn't it? As a matter of fact, we are nowhere close to developing a system that can completely blur the line between A.I. and humans. It is rather disappointing, isn't it?

The current state of A.I. development is quite rapid and notable. There is some significant progress in developing assistants and bots that interact just like humans. We are now closer to developing a real-life 'JARVIS' than ever before. There exist systems that effectively are indistinguishable from a human, in very few aspects. That's progress, right? The assistants in existence such as Siri, Cortana and the Google assistant serve as useful assistants for basic tasks.

Moreover, you can use them just to hear a joke or even for small talk! We have all been there, talking to an assistant testing it's ability, asking all kinds of amusing questions.

In this case, unknowingly, you are performing a Turing Test. The Turing Test, developed by Alan Turing, is a method of inquiry for determining whether or not a computer is capable of thinking like a human being in terms. To better understand Turing Test, imagine a machine interacting with you and there's a smokescreen between you and the machine. If you fail to correctly tell whether you are interacting with a machine or a human, the machine passes the Turing Test.

The Google assistant's Duplex feature, unveiled at Google I/O 2018, was truly a shocker! "Is this for real?", many asked themselves. The phone call sounded so real, like it was just a normal phone conversation, just a lady booking a salon appointment. According to Sundar Pichai, the CEO of Google, the assistant can understand the nuances of conversation and adapt to the ongoing real-time conversation. It even adds pauses and voice-modulations is associated to normal human speech. Then there's Sophia, the world's first robot-citizen, that changes the way we perceive robots. It or She, as you prefer is able to exhibit human expressions! Also, Sophia has a sense of humor. Who would have thought that a robot could look and interact almost like a human? Ideally, she can live on forever. An upside to being a robot! Sophia is not the only one. There are several robots out there that exist with the purpose of making our lives better.

In future, we may expect many advancements in the AI-powered assistants. There will be drastic improvement on how well they respond or interact with humans. Hopefully, we will have an assistant that can pass the Turing Test and interact like an actual human. The way we interact with other humans or with machines may change drastically with the significant on-going progress in AI in the near future. Although, a real life JARVIS seems like a far-fetched idea, we can surely look forward to several advancements in AI assistants that bridge the gap between human interaction and machine interaction.

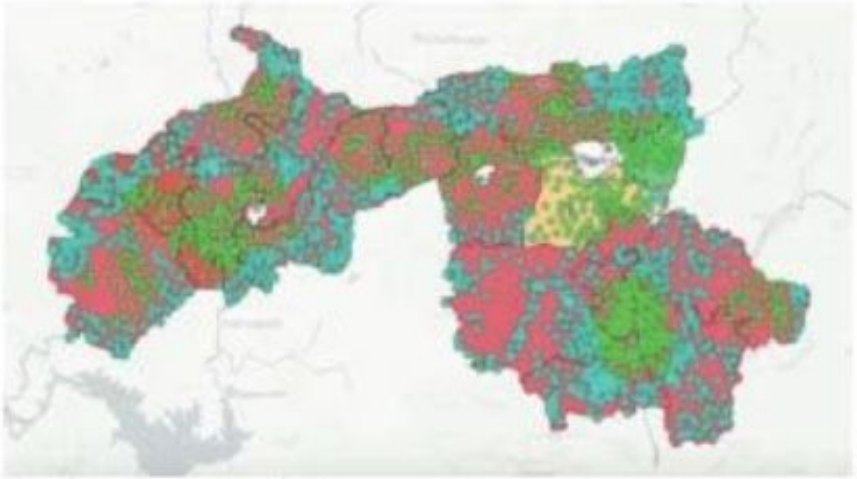
BIG DATA

Mugdha Asgekar(TE Computer)

Big data is extracting trends, insights and patterns from enormously large data sets. Germany used big data to win the FIFA World Cup in 2014. If you give some thought to it, you will wonder why is big data used in some aspects and not in others. Why not in healthcare, education, crime, statistics, weather patterns and most importantly environment and major critical issues in our country India?

Well it's easier said than done. The single most bottleneck was the data itself. Data was recorded on paper and that too in many regional languages. There were datasets which had two villages having the same name or even pronounced and written differently. In one dataset Panjim was called Parjim while in the other dataset Panjim was called Panaji. Wouldn't it be great if the datasets could be drawn together regardless of their problems so that data driven decisions could be made for the better?

Let's look at a real-life scenario of how big data influenced decisions. Petroleum and three oil companies decided to open 10000 LPG centres so that clean cooking fuel was accessible to rural areas. To locate where the centres should be opened, they partnered up with the "Social Cops" organization. The decision of opening the LPG centre at the right place was crucial. So that any individual from their house had to travel less distance to access clean cooking fuel. Several things had to be considered, firstly the LPG centres would be controlled by entrepreneurs so they had to be profitable and second and most important that the LPG gas centre was accessible to all within 10 kms of their homes. To achieve this goal, traditionally it would require many field officers and hands-on map but they decided to do it all through big data. Social cops team worked with the data provided by the gas companies about supply demand, number of consumers and sales. But the companies would care only about their profit right? What about the villages where people still use wood as a fuel? Every one of India's 640000 villages were mapped and brought together with 600 external data sources of infrastructure, population and so on. But something wasn't right, they also had to count in the already existing LPG centres. Within a month 17,000 of the distributers across India downloaded the organizations app and submitted their location coordinates. Now that they had all the data available, they made the data talk together through data intelligence and data algorithms. For an example: it knew that Bombay was changed to Mumbai in 1995 and likewise some others. But the question still remained where to locate the LPG centres?



- Green dots - All Villages
- Blue dots- Villages without LPG centre nearby

Sundargarh district of Orissa

The best fit for a centre would be a centralized place having a market where villagers already go there, having good roads for commutation, an ATM bank nearby and electricity. All these parameters were used by algorithms to create enormous data and pinpoint the exact location where LPG gas centre is to be placed. Big data can do such amazing wonders like this one and come up with smart decisions that could help the country grow economically and also socially.

CONTENT BASED FILTERING

Suraj Shetty(TE Computer)

What Is Content-Based Filtering?

When a friend asks you for a movie recommendation or any other recommendations, it's natural to ask what kinds of movies they like. From there, you could think of a few movies that are similar to the things we have watched and liked in the past. This process, of recommending content based on its features, is at the heart of content-based filtering, the technology used behind Netflix recommendation engines.

WHY CONTENT-BASED FILTERING?

Content-Based filtering has a number of advantages, especially in certain circumstances.

1. Results is highly relevant to Our Expectations. Because content-based recommendations rely on characteristics of objects themselves, they are most likely to be highly relevant to a user's interests. This makes them valuable for organizations with massive libraries of a single type of content.

2. Recommendations are transparent. Another advantage is that the process by which any recommendation is generated can be made transparent, which may increase users' trust in their recommendations. With collaborative-filtering, the process is more of a black box–the algorithm and users alike may not really understand why they're seeing the recommendations they are.

3. It's technically easier to implement. Compared to the sophisticated math involved in building a collaborative-filtering system, the data science behind a content-based system is relatively straightforward. The real work, as we've seen is in assigning the attributes in the first place.

CHALLENGES OF CONTENT-BASED FILTERING

1. Scalability is a challenge. As we know that the key requirement when it comes to content-based filtering is domain-specific knowledge. Furthermore, manual tagging of attributes has to continue as new content is added.

2. Attributes may be incorrectly or inconsistently applied. Content-based recommendations are only as good as the subject-matter experts who are tagging items. When you have hundreds of thousands (or millions) of items, it can be a challenge to ensure attributes are applied consistently or accurately.

In this recommendation system the contents of the movie (overview, cast, crew, keyword etc) is used to find its similarity with other movies. Then the movies that are most likely to be similar are recommended. This can be done through content based similarity easily.

GENOME SEQUENCING AND GENE EDITING

Aishwarya S Muchandi(TE Computer)

Since the illnesses, an individual experiences in a life time, are largely determined by their genetics, there has been significant interest to better understand our genetic makeup for years. Our progress was stalled by the complexity of data needed to be evaluated for understanding genetic makeup. But now, with the advances in artificial intelligence and machine learning applications, researchers are better able to interpret and act on genomic data through genome sequencing and gene editing.

A genome sequence is a specific order of DNA building blocks (A, T, C, G) in a living organism; the human genome is made up of 20,000 genes and more than 3 billion base pairs of these genetic letters. Sequencing the genome is a critical first step to understanding it.

The latest technology called high-through put sequencing (HTS) allows the sequencing of DNA to occur in one day—a process that once took a decade when it was first done. When changes are made to DNA at a cellular level, it's called gene editing.

Gene technology is restricted to a particular gene, hence it will differ from person to person. Hence it promises the development of predsion or personalized medicine. Machine Learning will help identify patterns within genetic data sets and then computer models can make predictions about an individual's odds of developing a disease or responding to interventions.

Google's tool DeepVariant uses the latest AI techniques to turn high-throughput sequencing (HTS) into a more accurate picture of a full genome. While HTS was available since the 2000s, DeepVariant is able to distinguish small mutations from random errors. Deep learning was instrumental in effectively training DeepVariant.

The Canadian start-up Deep Genomics uses its AI platform to decode the meaning of the genome to determine the best drug therapies for an individual based on the DNA of the cell. The company's learning software analyzes mutations and uses what it's seen in the hundreds of thousands of mutation examples it's analyzed to predict the impact of a mutation.

CRISPR ,a gene-editing technology, is a collaboration between computer scientists and biologists. There are positive outcomes for "editing out" genes that might cause disease "editing in" genes that create high-yielding, drop-resistant crops, but it also introduces complex ethical, moral and legal implications. Most people can see the benefits of "optimizing" health by editing mutated genes, but the issue is more complex when we begin to "optimize" the human race.

Another thing experts are working to resolve in the process of gene editing is how to prevent off-target effects when the tools mistakenly work on the wrong gene because it looks similar to the target gene.

One way of Approach is to design the learning systems extract heuristics from existing adaptive systems. Genetic Algorithms are Heuristic learning models based on principlesdrawn from natural evolution and selective breeding. Genetic Algos are also applied in areas of tradifional ML problems, including concept learning from examples, learning weights for neural nets and learning rules for sequential decision problems.

The chromosome of the genetic algorithm represents a set of condition action rules for controlling any functions or adions of robot. The performance is measured on a resulting control strategy (using stimulator) in adverse conditions such as; tracking a prey, seeking a goal while avoiding obstacles. Thus learning from multi-agent environments and also from the behavior exhibited from external agents. So hence focusing on learning competitive strategies against an opponent which is itself a learning agent.

This is a usual situation in natural environments in which multiple spedes compete for survival.

So initial studies lead us to expect that genetic learning systems can successfully adapt to changing environmental conditions

Artifidal intelligence and machine learning help make gene editing initiatives more accurate, cheaper and easier. The future for AI and gene technology is expected to include genetic screening tools for newborns, enhancements to agriculture and more.

While we can't predict the future, one thing is for sure: AI and machine learning will accelerate our understanding of our own genetic makeup and those of other living organisms.

"SMART GADGETS ARTICLE"

Bhavik Jain, Ujjwal Jain(SE Computer)

Smart gadgets for smart generations

DEFINITION

A smart device, as the name suggests, is an electronic gadget that's able to connect, share and interact with its user and other smart devices.

CONCEPTS

A smart device is an E-Device, generally connected to many other devices or networks via different networking devices and network protocols such as Bluetooth, Wi-Fi, radio-waves, etc.

- The term can also refer to those devices that contain similar properties of Ubiquitous computing, including although not necessarily (artificial intelligence) AI.
- Smart devices are interactive electronic gadgets that can understand simple commands and basic instructions sent by users and help in daily activities. While many smart devices are small, portable personal electronics, they are defined by their capability to connect to a network to share and interact accordingly.

THEORIES INCLUDED;

- UBIQUITOUS COMPUTING-It is a paradigm in which the processing of information is linked with each activity or operation is performed. It involves connecting E-devices and also includes embedding microprocessors to communicate in between and transfer information. Devices that use ubiquitous computing have constant availability they are fully connected. This computing technique of computing focuses on learning by removing the complexity and increases optimality while using computing for different general and usual activities.
- ARTIFICIAL INTELLIGENCE-Artificial intelligence (AI) is an area of computer science that generally focuses on the creation of intelligent machines that work, process and act like humans. Some of the operations of machine with artificial intelligence are designed for include:
- FEATURES OF AI-
- 1-Speech recognition
- 2-Planning
- 3-Problem solving
- CLOUD COMPUTING ROLE-Cloud computing and the Internet of Things (IoT) are distinctively two separate technologies that are closely knitted. With these two technologies combined, it will lead to new inventions. It will change the way how we store, manage and uses information.

- Generally, it is a complex web of physical devices, vehicles, home appliances and smart gadgets.

SOME OF COMPANIES MAKING SMART GADGETS

- 1-GOOGLE- Alexa is a virtual digital assistant developed by Amazon for its AMAZON ECHO and line of computing devices. Alexa's Function are like those of our other intelligent assistants such as Apple Siri, Microsoft Cortana, Google Assistant, and SAMSUNG BIXBY
- 2-JOLLA-It's a developer of mobile devices, built on its own open operating system (OS), called Sailfish, which features live multitasking, and gestures based on the natural movements of your hand.
- 3. MOOV- It offers a wearable fitness tracker that uses three sensors to form a nine-axis motion-sensing system. Paired with MOOV's software, the data collected by this hardware can reconstruct your movements in 3D and guide you on how to improve your workout and how to prevent injuries.
- 4. CLINIC CLOUD-It offers "the medical kit of the future" with a digital stethoscope and a non-contact thermometer for the home. Parents can record and monitor children's fever, coughs, and colds, and even get medical help at home through the iOS or Android app.

RECENT INNOVATIONS

- Amazon Alexa. ...
- Google Assistant. ...
- Wink Hub 2. ...
- Samsung SmartThings Hub. ...
- Best Speaker: Amazon Echo (2nd Generation) ...
- Best Lights: Philips Hue. ...
- Best Light Switch: TP-Link HS200. ...
- Google Assistant...

ADVANTAGES

1-Convenience at Various Levels. ...
2-An Unprecedented Level security...
3-Peace of Mind to Vulnerable people and their caregivers. ...

DISADVANTAGES

1- Dependency on Internet...
2-Dependency of professionals...

NOTHING

Tejas Deshmukh(TE Computer)

The word "Nothing" is so mysterious! No one knows anything about nothing. But we have the power of imagination; we can define nothing in different ways looking at it with different perspectives. It's gonna get a little heavy out there, but stick up to understand what and why "You are what you are"..!

Scientifically, according to the big bang theory, universe and what lies beyond, emerged out of nothing. Particles get created and destroyed in the very millionth of a second. So, Can Nothing be said to be in existence because of something? If so, the universe shouldn't have existed. In fact, we don't know, and there's no way of knowing this.

Other perspective to look at nothing can be "an object to sense".Nothing is not something. When there are natural calamities like fires, cyclones, tsunamis, etc; houses get destroyed and are left with 'nothing'.People die and are turned to ashes; they become nothing. This arise to me that something is getting turned to nothing. And we say, universe came out of nothing ;and now ,we are saying people die, so we are turning to nothing. So, can we say that something came out of nothing, and now nothing will come out of something? This will make your brain's neurons dance. This is in fact the question which may never be answered, no matter how much further the human race goes.

We know energy cannot be destroyed, it can only be only converted from one form to another.So maybe a "thing" cannot be destroyed, it can only be something or nothing. That's how I think of nothing. So this makes us immortal. We existed out of nothing and we are something right now just to become nothing again and will become something again. Understand this similarity? It's a loophole.

It will take a long time to understand nothing. A book is a book although nothing is written in it. We know nothing about our existence. What is the purpose of our existence?
Did this ever make you wonder ..? If yes, then well, you really are 'something'.....

Jokes apart, but if you do , then you really think out of the box, think something related other than just living your life by the rules defined by our ancestors. But the matter of fact is, I came out of nothing; and from nothing to nothing, I will travel the dull way which is leading to nothing. We are all going to be ashes, that's our destiny, they say. But I won't call it a full stop.

People say that you don't leave without nothing, that, other people will always remember you. Well, they will eventually, die one day too and ,even if my name survives; I feel ,even if they carry forward my name, there's a saying "Nothing is there in the name". They will remember my name, but if they cannot even remember my work and who I was, there's nothing that they know they can relate to a person's life. In short, they'll know nothing about me and thus my life will be ended in nothing and so do everyone's will. It won't matter if it was a he or a she, a poor or a rich, a good person or a bad person, a smart or a dull, everything will turn to nothing. It is sad when we think of it from the future point of view. It's like having no motivation to live out the life and no fear of the unknown death.

But what if we can find a purpose? I don't know whether we are living in a simulation,a virtual reality or just, this is the reality, If we can achieve something or nothing;we must understand that this is not something that matters to us humans.

Have you ever seen a child who knows nothing , but is still smiling without a purpose? We can create purposes. What matters is living the positive moments in our life enjoying them to our fullest and that is what makes our life, a 'life'.A life without death wouldn't be a life. We don't know what lies ahead; we know nothing, but think in a way; we cannot understand the true meaning of happiness without sadness; the same way, we cannot understand the true meaning of something that we have right here, right now; without nothing.So for me, I think of nothing as a positive "thing", even if it starts with a "NO".

Maybe it is the absence of someone in your life, you have nothing in your life , your relationship has ended in a 'nothing', everything is valuable, even 'nothing'.This nothing, this absence, is going to teach you something in your life, may be to move forward and never look back, accept the past which had something that lead you to nothing, or go beyond whatever you are now currently.

Our life with the huge life span we have, is worth living. Thus, even if we know nothing about nothing, We know many things about something; and sometimes, it is a wise decision to let the unknown be unknown.

FOR THIS MOMENT IS LIFE

Gauri Deshpande (TE Computer)

If you cannot relate to whatever I am about to tell you, either you are not from this generation or not from this planet! Well if the latter part is true, HI you extraterrestrial species! Well, jokes apart, I want you all to take a wild guess as to what it could be!

Now if your guess was not following traffic rules or littering the streets, unfortunately you guessed it wrong! Although that might be something to talk about wouldn't it? As a responsible citizen, it would definitely be a good idea to spread awareness through a platform like this, but we will save that for some other time! For now, let's pretend we are responsible adults who know right from wrong! What I really want to talk about in this post is this...I'm sure all of you must have visited a place of surreal beauty, where everything that you laid your eyes upon seemed like it had dropped down straight from heaven! Apart from admiring the beauty around you for no more than 5 seconds, what is the next immediate thing you did? We all know the answer to this one...We reached out for our pockets, took out our phones and started showing off to the world how amazing our life is! You know what would have been more amazing?

Admiring that same view for a little longer than 5 seconds and filling your bones with the positivity that laid around. We are in that time of our era where 'evidence' is more important than 'memories'. I mean I still remember my childhood days...oh the 90's... where there were so many endless memories made but there was no evidence of those memories, apart from some really hysterical photos that we could actually call candid! What we often forget is once a moment is gone, it's gone! Can't we put our phones in our pockets a little longer and just be? Be alive, be present,be thankful, be stunned by the beauty around us? Can't we just live in the moment for a little while? Can't we enjoy the hot delicious food without getting a perfectly angled Instagram photo of it? Yes, we can! You know how? By simply realizing the fact that at the end of the day, when you look back at all the bewildering things you did or experienced, what matters are the memories that you took back., the way that moment made you feel, the burning sensation on your tongue you got by having a sip of that hot soup without capturing it first! Photos and evidence of you living that moment is secondary, but truly living in that moment is something that is primary!

In no way am I saying that you shouldn't post pictures of that really yummy dessert you had or that really pretty resort that you visited over the weekend, most certainly do all those 'tumblry' things. But before you get so engraved in the virtual world, please do not forget to cherish all that you experience.
Fill your eyes with that breath-taking sunset, relish your taste buds with that mouth-watering dish, dance your heart out to your favourite song. Do what everyone else is forgetting to do these days...LIVE...Just live in the moment.

For this moment is life!!!

ARE IDEAS GETTING HARDER?

Aditya Sable (TE Computer)

Robert Gordon, an economist at Northwestern University, says we're unlikely to match the heights of discovery that marked the late 19th and early 20th centuries, when inventions such as electric light and power and the internal-combustion engine led to a century of unprecedented prosperity. It makes sense that we've already picked up of what some economists like to call the "low-hanging fruit" in terms of inventions. Could it be that the only fruit left are a few shriveled apples on the farthest branches of the tree?

If he is right, and there are only few big inventions left, aren't we doomed to a dismal economic future? But few economists think that's not the case.Rather, it makes sense that big new ideas are out there; it's just getting more expensive to find them as the science becomes increasingly complex. So, we'll need more and more researchers to make sense of the advancing science.

Which is evident from the fact that a new research involving drug discovery, semiconductor research, medical innovation, and efforts to improve crop yields, have come to a common conclusion: the investments in R&D are increasing sharply while the payoffs are staying constant.

So, if we're still doubling the number of transistors on a chip every two years, its only because we're still putting more and more money and people into research. And to maintain a steady growth rate, we'll have to double our investments in research and development over the next 13 years. While searching for the real cause, one may find that the problem is that human researchers can explore only a tiny slice of what is really possible.So, what's the way out?

Does AI have the potential to solve the kinds of problems that new innovation demands? Some experts now think that it can. The reason being,the bottleneck that has slowed development in various fields is exactly where deep learning excels. From largely affecting the areas of image recognition and language comprehension, to transforming the task of finding new drugs,AI and Machine Learning are excessively being used in complex sciences.

In a recent paper, economists at MIT, Harvard, and Boston University argued that the AI's greatest economic impact could come from its potential as a new "method of invention" that ultimately reshapes "the nature of the innovation process

and the organization of R&D". So, the biggest impact of artificial intelligence will be to help humans make discoveries we couldn't make on our own.

Are Ideas Getting Harder Iain Cockburn, a BU economist, says, "New methods of invention with wide applications don't come by very often, and if our guess is right, AI could dramatically change the cost of doing R&D in many different fields." Much of innovation involves making predictions based on data. In such tasks, Cockburn adds, "machine learning could be much faster and cheaper by orders of magnitude."

In other words, AI's greatest legacy might not be driver less cars or image search or even Alexa's ability to take orders, but its ability to come up with new ideas to fuel the Innovation itself.

TEAMWORK

Radheshyam Yadav (TE Computer)

Teamwork can be defined as the skill to work with a team of people collaboratively for achieving a particular goal. It plays an important part in the success of a business because it is important for colleagues to work in a team and try their best in all the conditions.

Characteristics of an Effective Teamwork:

In a group of people, the characteristics of the effective teamwork consist of the willingness to take responsibility and set aside the personal issues for achieving a common goal. Have a look at the characteristics of the effective teamwork:

•Credibility: All the people in the group should take responsibility and accept the credit for their actions as a team and not on an individual basis.

•Sense of purpose: There is a need to have a sense of purpose in the team for achieving a specific and clear mission. All the members of the team should believe that this mission is necessary to attain.

•Accountability: It is necessary that the teams must be accountable as a group for all their failures and successes. It means that you required rewarding the team as a group for their accomplishments if you are a business owner.

•Cooperative Spirit: There is a need for the spirit of cooperation in a successful team. All the members required to work collectively for achieving the specific missions. It can be tough if some of the individuals in the group are highly opinionated or strong personalities.

•Appreciation: All the members of the group should appreciate the knowledge's diversity, which the other individual in the group can offer. They should use the skills and knowledge of a particular member in a convincing way for achieving the organization's goals.

Types of Teams

There are four main types of teams explained below:

• Informal Teams : The main motive behind forming an informal team is social purposes. This type of team facilitates the employee pursuits of the common concerns such as improvement in the working conditions.

• Problems Solving Teams: These types of teams are formed when a problem can't get solved within the structure of the standard organization.The problem-solving team works in a cross-functional way for the betterment of an organization.

• Leadership Teams: The leadership teams consist of management that brings together for spanning the boundaries between the several functions in the company. The heads of finance, marketing, and production have to interact with each other and come with a common goal for the product.

•Self-Directed Teams: In these types of teams, the autonomy is given to decide how a work will be completed. The self- directed teams are offered with a mission by the company and then determine how to complete this purpose.

OUR COLLABORATIONS

Open Source Experimental Lab

Open Source Experimental Lab is a collaborative effort of APSIT and ASHNIK PTE LTD Singapore to impart skills in the areas of open source technologies including Database, Docker, Elastic Stack, NGINX, Cloud Computing to develop necessary industry skills.

AWS Web Services Educate program

Amazon Web Services & Educate program prepares students for booming technology of Cloud Computing. AWS certification is a doorway to IT industry.

Partnership with Leading India

APSIT joined the Leading India program of Government of India whose objective is to make Deep Learning and AI skills mainstream in India to fulfill trilateral needs of entrepreneurship, Industry academia partnership and application-inspired Engineering Research.

OUR RECRUITERS