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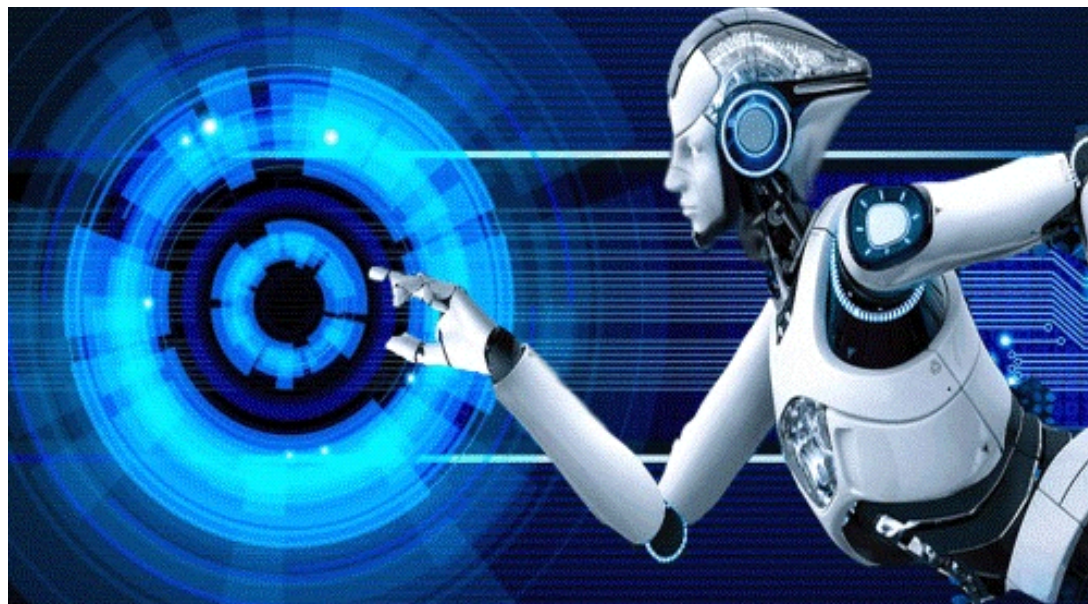
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Artificial Intelligence

In today's world, technology is growing very fast, and we are getting in touch with different new technologies day by day.

Here, one of the booming technologies of computer science is Artificial Intelligence (AI) which is ready to create a new revolution in the world by making intelligent machines. Artificial Intelligence is now all around us. It is currently working with a variety of subfields, ranging from general to specific, such as self-driving cars, playing chess, proving theorems, playing music, painting, etc.

AI is one of the fascinating and universal fields of Computer science which has a great scope in future. AI holds a tendency to cause a machine to work as a human.



Introduction to AI

Artificial Intelligence is composed of two words Artificial and Intelligence, where Artificial defines "man-made," and intelligence defines "thinking power", hence AI means "a man-made thinking power."

So, we can define AI as:

"It is a branch of computer science by which we can create intelligent machines which can behave like a human, think like humans, and able to make decisions."

Artificial Intelligence exists when a machine can have human-based skills such as learning, reasoning, and solving problems. With Artificial Intelligence you do not need to preprogram a machine to do some work, despite that you can create a machine with programmed algorithms which can work with own intelligence, and that is the awesomeness of AI.

It is believed that AI is not a new technology, and some people say that as per Greek myth, there were Mechanical men in early days which can work and behave like humans.

Importance of Artificial Intelligence

Artificial Intelligence (AI) has made it possible for machines to learn from experience and grow to perform human-like tasks. A lot of flashy examples of Artificial Intelligence you hear about like Self Driving Cars, Chess Playing Computers rely heavily on Deep Learning and Natural Language Processing. Using these technologies, computers can be trained to accomplish specific tasks by processing large amounts of data and recognizing patterns in the data. If we have a look at the Importance of Artificial Intelligence:

AI automates Repetitive Learning and discovery through data. Artificial Intelligence performs frequent, high-volume, computerized tasks reliably and without fatigue.

AI adds intelligence to existing products. In most cases, AI will not be sold as an individual application. Rather, products you already use will be improved with AI capabilities, much like Google Assistant was added as a feature to a new generation of Mobile Phones.

Face Recognition

Face recognition technology has always been viewed as something straight out of science fiction. Over the past decade, this ground-breaking technology has not just become viable, but it has also become widespread. In fact, it seems almost impossible nowadays to read technology news which do not deal with face recognition. There are several industries which benefit from this technology. Crime and violence are being prevented by retailers. Face recognition is used by law enforcement agencies to keep communities safer. Airports are improving traveller's convenience and security. Facial recognition is used particularly by mobile phone companies in order to provide consumers with new layers of biometric security. It may seem to some people that facial recognition is very recent and that it came out of nowhere. In reality, this technology has been used for some time already.

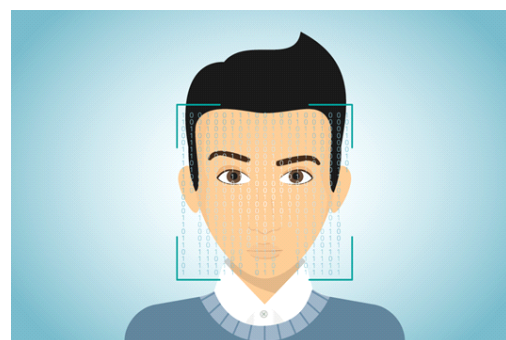
Message from CMD



G-TEC has always stood as a tie that connects people with technology and skills ever since we established two decades ago. While we celebrate our 20th birthday in 2020, we have added more perfection to it by adjoining MEANING and SUSTAINABILITY to technology and skills training. From Drone Programming and 3D Printing for school children, to Full Stack Development, Data Science and IT Security to job seekers and professionals, our focus has been on skills and technology that gives our students the STATUS AND STANDING in the job market. **The focus is, was and will always be our students.** We have grown from 300 to 400 course academia while our International certification quivers 20+ global benchmarks from SAP to ACCA, from Adobe to Autodesk, from Microsoft to EC Council and more.

Scaling to new continents and marking our presence in more nations to skill and up-skill our fellow beings beyond the thin lines of caste, creed, race, and economy, will remain the rotary of our action. Inspired by our 1.8 million alumni, their contributions to the society, nation and our planet as a whole, we strive to serve more with pace and perfection as is in a 20-20 match. We also have geared up ourselves to add more fun, arts and cultural events to our technology training to inculcate the value of unity and collaboration through our mega event called G-Zoom. A world where education seeds success and culture breeds compassion, that is where we see us in 2020.

Many more years to come, many more students to be skilled, our mission remains the same – Making Professionals Globally.



What is Biometric ?

Biometrics is the measurement and statistical analysis of people's unique physical and behavioural characteristics. The technology is mainly used for identification and access control, or for identifying individuals who are under surveillance. The basic premise of biometric authentication is that every person can be accurately identified by his or her intrinsic physical or behavioural traits. The term biometrics is derived from the Greek words bio meaning life and metric meaning to measure.

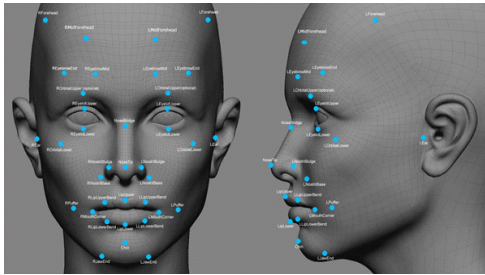
Biometric includes the methods for uniquely recognizing humans based on one or more physical or behavioral traits.

Physical Biometrics : Based on measurements and data derived from direct measurements of a part of the human body

- Finger Scan
- Facial Recognition
- Iris Scan
- Retina Scan
- Hand Scan

Behavioral Biometrics : Based on measurements and data derived from an action

- Voice scan
- Signature scan
- Keystroke scan



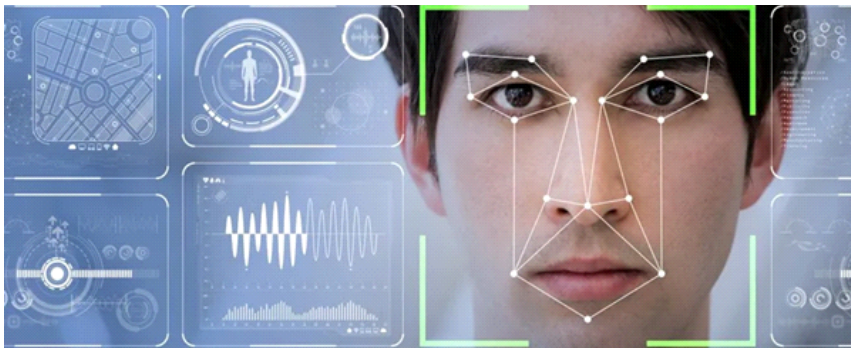
How Face recognition works ?

Facial recognition software is based on the ability to first recognize faces, which is a technological feat in itself. If you look at the mirror, you can see that your face has certain distinguishable landmarks. These are the peaks and valleys that make up the different facial features.

There are about 80 nodal points on a human face. Here are few nodal points that are measured by the software.

- Distance between the eyes
- Width of the nose
- Depth of the eye socket
- Cheekbones
- Jaw line
- Chin

These nodal points are measured to create a numerical code, a string of numbers that represents a face in the database. This code is called face print. Only 14 to 22 nodal points are needed for face it software to complete the recognition process.



Virtual Reality

The definition of virtual reality comes, naturally, from the definitions for both 'virtual' and 'reality'. The definition of 'virtual' is near and reality is what we experience as human beings. So the term 'virtual reality' basically means 'near-reality'. This could, of course, mean anything but it usually refers to a specific type of reality emulation.

We know the world through our senses and perception systems. In school we all learned that we have five senses: taste, touch, smell, sight and hearing. These are however only our most obvious sense organs. The truth is that humans have many more senses than this, such as a sense of balance for example. These other sensory inputs, plus some special processing of sensory information by our brains ensures that we have a rich - flow of information from the environment to our minds. Everything that we know about our reality comes by way of our senses. In other words, our entire experience of reality is simply a combination of sensory information and our brains sense-making mechanisms for that information. It stands to reason then, that if you can present your senses with made-up information, your perception of reality would also change in response to it. You would be presented with a version of reality that is not really there, but from your perspective it would be perceived as real. Something we would refer to as a virtual reality.



Internet of Things (IoT)

The Internet of Things is the concept of connecting any device (so long as it has an on/off switch) to the Internet and to other connected devices. The IoT is a giant network of connected things and people all of which collect and share data about the way they are used and about the environment around them. That includes an extraordinary number of objects of all shapes and sizes from **smart microwaves**, which automatically cook your food for the right length of time, to **self-driving cars**, whose complex sensors detect objects in their path, to wearable **fitness devices** that measure your heart rate and the number of steps you have taken that day, then use that information to suggest exercise plans tailored to you.

There are even **connected footballs** that can track how far and fast they are thrown and record those statistics via an app for future training purposes.

How does it work?

Devices and objects with built-in sensors are connected to an **Internet of Things platform**, which integrates data from the different devices and applies analytics to share the most valuable information with applications built to address specific needs.

These powerful IoT platforms can pinpoint exactly what information is useful and what can safely be ignored. This information can be used to detect patterns, make recommendations, and detect possible problems before they occur. For example, if I own a car manufacturing business, I might want to know which optional components (leather seats or alloy wheels, for example) are the most popular.

Using the Internet of Things technology, I can:

- Use sensors to detect which areas in a showroom are the most popular, and where customers linger longest;
- Drill down into the available sales data to identify which components are selling fastest;
- Automatically align sales data with supply, so that popular items do not go out of stock.

The information picked up by connected devices enables me to make smart decisions about which components to stock up on, based on real-time information, which helps me save time and money.

With the insight provided by advanced analytics comes the power to make processes more efficient. Smart objects and systems mean you can automate certain tasks, particularly when these are repetitive, mundane, time-consuming or even dangerous. Let us look at some examples to see what this looks like in real life.



IoT in your home

Imagine you wake up at 7 am every day to go to work. Your alarm clock does the job of waking you just fine. That is until something goes wrong. Your train is cancelled and you have to drive to work instead. The only problem is that it takes longer to drive, and you would have needed to get up at 6.45am to avoid being late. Oh, and it is pouring with rain, so you will need to drive slower than usual.

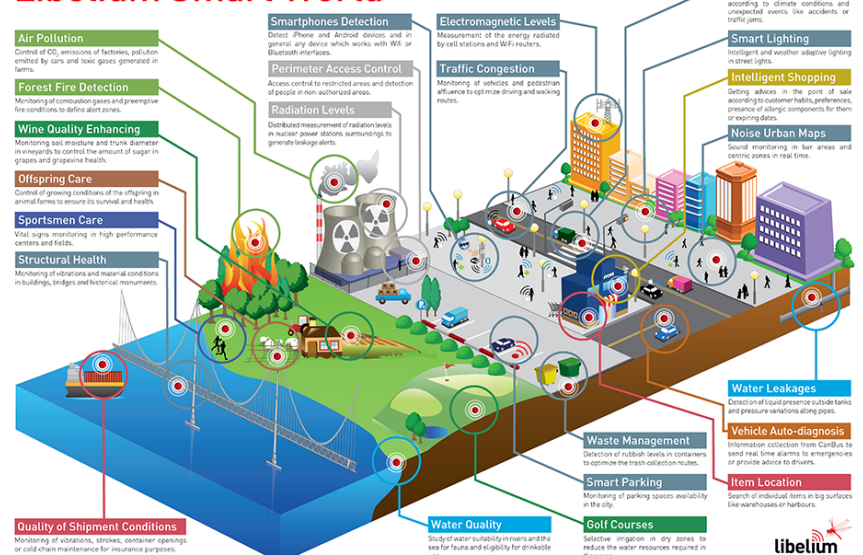


A connected or IoT-enabled alarm clock would reset itself based on all these factors, to ensure you got to work on time. It could recognize that your usual train is cancelled, calculate the driving distance and travel time for your alternative route to work, check the weather and factor in slower travelling speed because of heavy rain, and calculate when it needs to wake you up so you are not late. If it is super-smart it might even sync with your IoT-enabled coffee maker, to ensure your morning caffeine is ready to go when you get up.

Smart World

On a broader scale, the IoT can be applied to things like transportation networks: "smart cities" which can help us reduce waste and improve efficiency for things such as energy use; this helping us understand and improve how we work and live. Take a look at the visual below to see what something like that can look like.

Libelium Smart World



The reality is that the IoT allows for virtually endless opportunities and connections to take place, many of which we cannot even think of or fully understand the impact of today. It is not hard to see how and why the IoT is such a hot topic today; it certainly opens the door to a lot of opportunities but also to many challenges. Security is a big issue that is oftentimes brought up. With billions of devices being connected together, what can people do to make sure that their information stays secure? Will someone be able to hack into your toaster and thereby get access to your entire network? The IoT also opens up companies all over the world to more security threats. Then we have the issue of privacy and data sharing. This is a hot-button topic even today, so one can only imagine how the conversation and concerns will escalate when we are talking about many billions of devices being connected. Another issue that many companies specifically are going to be faced with is around the massive amounts of data that all of these devices are going to produce. Companies need to figure out a way to store, track, analyze and make sense of the vast amounts of data that will be generated.

Why Learn Python?

Python is a general-purpose language, which means it can be used to build just about anything, which will be made easy with the right tools/libraries. Professionally, Python is great for backend web development, data analysis, artificial intelligence, and scientific computing. Many developers have also used Python to build productivity tools, games, and desktop apps, so there are plenty of resources to help you learn how to do those as well, Python can use in wide variety applications.



Easy to Understand

Being a very high-level language, Python reads like English, which takes a lot of syntax-learning stress off coding beginners. Python handles a lot of complexity for you, so it is very beginner-friendly in that it allows beginners to focus on learning programming concepts and not have to worry about too many details.



Desktop apps & Web apps



Data mining



Scientific computing

Future Technologies Counting On Python

Generally, we have seen that python programming language is extensively used for web development, application development, system administration, developing games etc.

But do you know there are some future technologies that are relying on python? As a matter of fact, Python has become the core language as far as the success of these technologies is concerned. Let's dive into the technologies which use python as a core element for research, production and further developments.

(1) Artificial Intelligence (AI)

Python programming language is undoubtedly dominating the other languages when future technologies like Artificial Intelligence(AI) comes into the play.

There are plenty of python frameworks, libraries, and tools that are specifically developed to direct Artificial Intelligence to reduce human efforts with increased accuracy and efficiency for various development purposes.

It is only the Artificial Intelligence that has made it possible to develop speech recognition system, autonomous cars, interpreting data like images, videos etc.

We have shown below some of the python libraries and tools used in various Artificial Intelligence branches.

- Machine Learning
- General AI
- Neural Networks
- Natural Language & Text Processing

(2) Big Data

The future scope of python programming language can also be predicted by the way it has helped big data technology to grow. Python has been successfully contributing to analyzing a large number of data sets across computer clusters through its high-performance toolkits and libraries. Let us have a look at the python libraries and toolkits used for Data analysis and handling other big data issues.

- Pandas
- Scikit-Learn
- NumPy
- SciPy
- GraphLab Create
- IPython
- Bokeh
- Agate
- PySpark
- Dask



(3) Networking

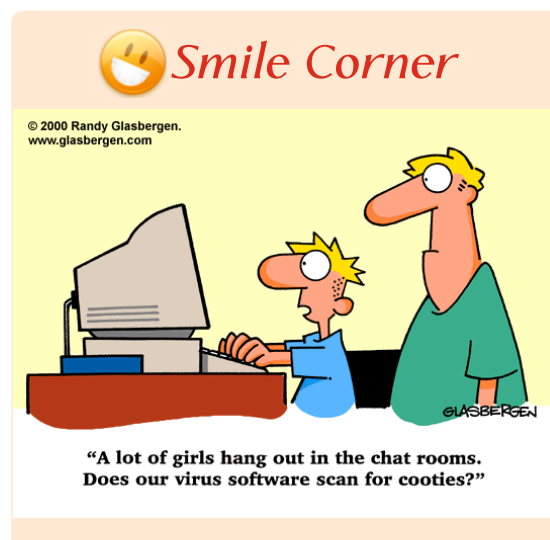
Networking is another field in which python has a brighter scope in the future. Python programming language is used to read, write and configure routers and switches and perform other networking automation tasks in a cost-effective and secure manner.

For these purposes, there are many libraries and tools that are built on the top of the python language. Here we have listed some of these python libraries and tools especially used by network engineers for network automation.

- Ansible
- Netmiko
- NAPALM(Network Automation and Programmability Abstraction Layer with Multivendor Support)
- Pyeapi
- Junos PyEZ
- PySNMP
- Paramiko SSH

On Angel List, Python is the 2nd most demanded skill and also the skill with the highest average salary offered.

With the rise of big data, Python developers are in demand as data scientists, especially since Python can be easily integrated into web applications to carry out tasks that require a machine learning.



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