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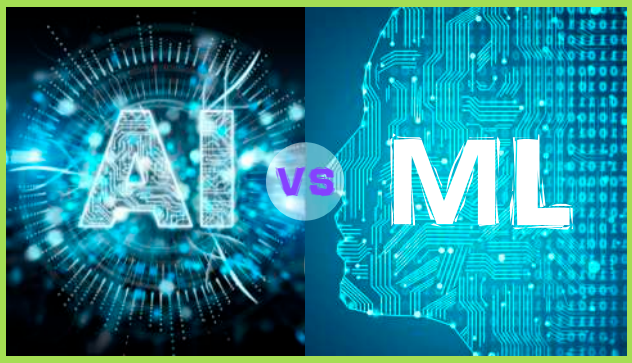
USHARAMA
COLLEGE OF ENGINEERING AND TECHNOLOGY

Article

Artificial Intelligence Versus Machine Learning

An Ongoing Battle...



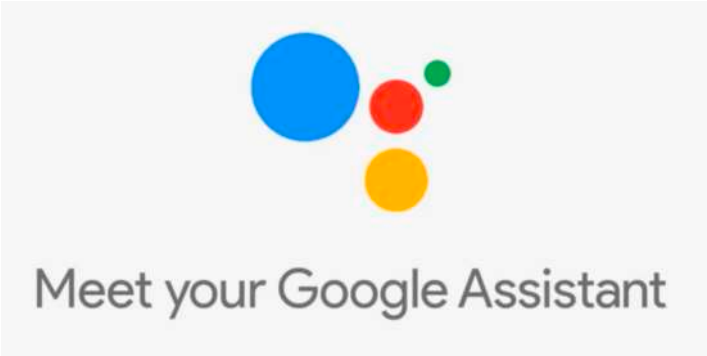
The debate over Artificial Intelligence versus machine learning seems never to stop. It seems to get more intense by the day.

Artificial Intelligence versus machine learning. Adding fire to the debate, take the pun in whichever way you want, is the recent claim by Sundar Pichai, Google CEO, that AI and machine learning are at the throes of taking the world to a plane not witnessed earlier. Well, he did not use these exact words but meant as much. The words he actually used were that AI and machine learning is more profound than fire or electricity, and these words purport the same.

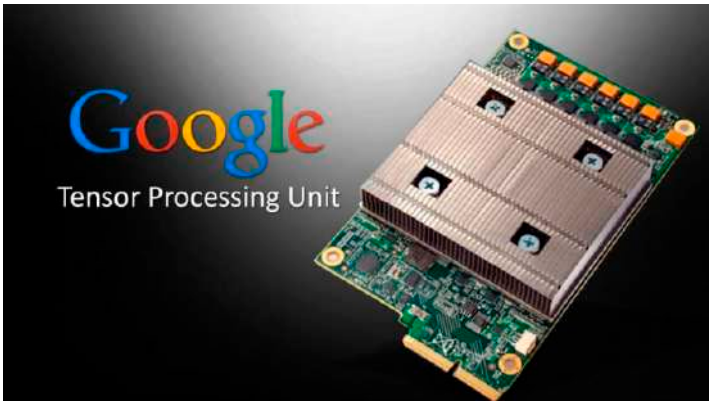
Expectedly, analysts, thinkers, technology gurus, and everyone of some eminence, and those without it jumped into the debate on whether AI is really what it is being made out to be. When he referred to AI and machine learning, Pichai meant AI from Google, his company. That opens up the first point of the debate, which is this: are AI and machine learning synonymous with Google, which seems to be transitioning from being a search engine to an AI company? AIright, let us leave this part aside for now because this topic takes the attention away from this topic and merits another discussion.

So, what is the basis for this assertion from Google's CEO? What is it about the AI, machine learning, and deep learning of today that is dramatic and different from what they were a few years ago that triggers this conviction in him? Has there been some kind of a paradigm shift in this technology, alluding to which Sundar makes his claim?

It has come up with Google Assistant, which, as we all know, mimics the human voice in a manner that fools the user into thinking that it is to a human that they are talking. But now, this is the catch: if this is the extent to which machine learning can take automation, is it significant enough to be considered something as path-breaking as fire or electricity? The answer should be a no.

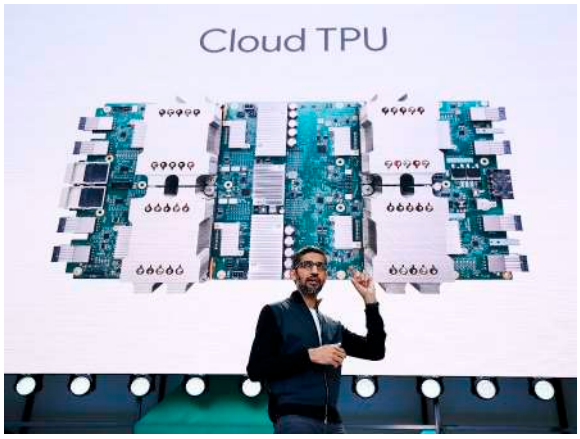


A Lot More To Come



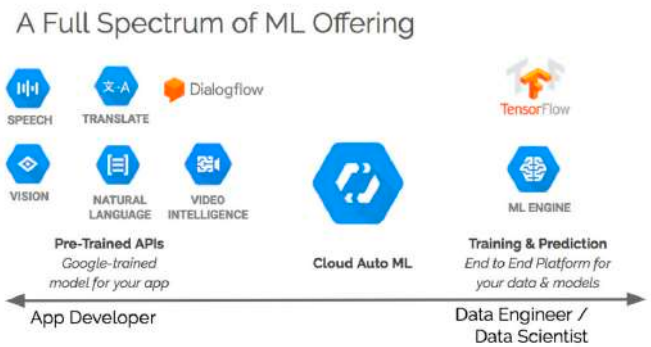
But wait before we sing the requiem for this debate. What Google has shown the world is only a part of what their AI, machine learning, and deep learning technologies can eventually deliver over time. A new computer processor it has developed has the software that learns how to learn. In other words, it designs machine learning software itself, something that its experts have been getting paid to do all this while. Is it a case of the Frankenstein, or one of one's excellence consuming oneself? It is too early to draw conclusions on this part, but what one can say with certainty is that the seeds for an altogether new paradigm in machine learning have been sown with this advancement.

Deep learning makes it possible to bring about a shift in the way intelligence is used to perform recognition tasks. Google's Cloud Tensor Processing Unit will dramatically hasten the speed at which AI recognizes objects.



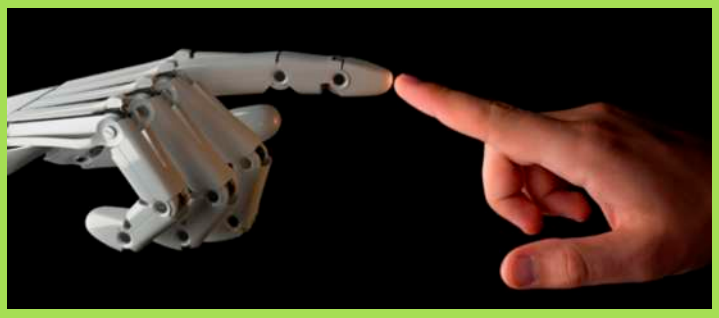
When it is developed to its logical end, who knows, Google Assistant might do unimaginable things in the future. The extent and depth of its prowess could range from robotic oncology surgery to agriculture to performing daily tasks that we humans have been conditioned for millennia to do. The technology that has enabled this, of which the human voice we hear in Google Assistant is just one part, is what has prompted Pichai to make his lofty claim about Google's deep learning technologies.

And then, there is also the fact of his company having introduced AutoML, a technology project that has come out from the Google Brain stable. We have known all along that AI has been around for a while, but where AutoML upends the existing technology is that it will take machine learning a step above by configuring architectures that teach software to perform image and language-related tasks, at which they either rivalled the best architectures to ever have been designed by humans or showed improvement over.



Whether Google's products from its AI, machine learning, and deep learning projects will change the face of mankind for the better or worse is difficult to predict, but the steps are being taken. This said, we have to understand on the concluding note that the Cloud Tensor only increases the speed of recognition and perhaps adds an element of improved efficiency. What it does not do, or has not yet done, is to make machines understand the difference between objects. As of now, the standpoint on which this technology performs that of recognition of objects to differentiate them, and not knowing or understanding them for what they are has essentially remained unchanged.

Could we say with confidence that the kind of tectonic shift being talked about can happen only when machines learn this skill, which is still not to be seen anywhere? Till then, should we take Pichai's words figuratively and not literally?



There is a platform that offers insights and knowledge about next-generation technologies and tries to guide its readers on how the developments in these areas make an impact on their lives. It tries to keep matters simple and easy to understand. It follows the tech industry closely and loves to keep its audiences updated about developments in these areas and follows thought leaders and game changers.

Article by
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Workshop

A one day workshop has been conducted on 21st february 2019 about Data Science & Analytics in Usha Rama College of Engineering & Technology at R-Block seminar hall.

The resource person for this one day workshop on Data Science & Analytics is Nithin Mishra who is a Data Scientist & Trainer for Analytics. He is a mechanical & Production Engineering graduate with over 17 years of industry Experiance. He trained over 300 persons in the last 2 years. He is a Data Scientist at ExcelR

This one day workshop has been conducted by Computer Science & Engineering Department of Usha Rama College of Engineering & Technology.

After this workshop a lot of Knowledge about Data Sciences & Data Analytics has been obtained.

Floating AI Astronaut Assistant

In modern era, artificial intelligence have been playing a prominent role in every field. Think of an AI robot in the space!

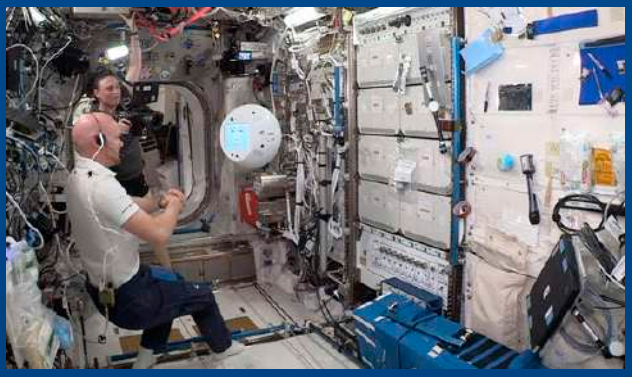
In this article, let us known about the AI robot that is Free-floating CIMON which stands for crew Interactive Mobile companion. It was the first interactive artificial intelligence powered assistant to go space. CIMON is a 3D printed plastic sphere, roughly the size of a basketball, which has been designed to test human-machine interaction is space.

The AI bot has been designed and developed by Germany based Airbus. This bot runs on Watson AI software provided by IBM. It goes by the name CIMON, short for "Crew Interactive Mobile Companion." Built by the aerospace design company Airbus in collaboration with IBM, CIMON houses artificial intelligence (AI) in an autonomous, spherical body that would "float" in the space station's microgravity environment, with a screen that can display data readouts for astronauts or present an image of a friendly face as well as a voice shaped by IBM's AI technology.

As an "intelligent" machine, CIMON could help the ISS crew to solve problems during their routine work by processing and displaying diagnostic data. But its neural network a computer system that works like the human brain would enable it to go a step further and also engage with astronauts as a "colleague," according to the statement "Hello, I am CIMON!".

CIMON weighs about 11 lbs. (5 kilograms) and is already "training" with an astronaut Alexander Gerst, who represented the European Space Agency (ESA) on the ISS from May to November 2014. Gerst will return to the ISS, bringing CIMON along, from June to October 2018, on ESA's Horizons mission. Since 2016, a team of 50 technicians has been working to prepare the AI for its trip into space, feeding it data about the ISS and ensuring that the robot can orient itself and move freely. At the same time that CIMON was learning about the layout of the ISS, it was also becoming familiar with its astronaut colleague Gerst, through photos and voice samples.

Once CIMON is in space, astronauts and the AI will work together on a series of tasks that includes working with crystals, solving a Rubik's Cube and performing a medical experiment in which CIMON will serve as an interactive camera, Airbus representatives said in the statement.



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Article

Snakebots

A snakebot, also known as snake robot, is a biomorphic hyper-redundant robot that resembles a biological snake. Snake robots come in many shapes and sizes, from the four stories long, earth quake snakebot developed by SINTEF, to a medical snakebot developed at Carnegie Mellon University that is thin enough to maneuver around organs inside a human chest cavity. Though snakebots can vary greatly in size and design, there are two qualities that all snakebots share.

First, their small cross section to length ratio allows them to move into, and maneuver through, tight spaces. Second, their ability to change the shape of their body allows them to perform a wide range of behaviours, such as climbing stairs or tree trunks. Additionally, many snake robots are constructed by chaining together a number of independent links. This redundancy makes them resistant to failure, because they can continue to operate even if parts of their body are destroyed. Properties such as high terrainability, redundancy,and the possibility of complete sealing of the body of the robot, make snake robots very interesting for practical applications and hence as a research topic.

Snakes move rapidly through unstructured environments and avoid obstacles by going around or over them, or through small holes in the obstacle, such as a rock pile. For years, engineers have studied the remarkable locomotion capabilities of snakes to make snake-like robots that move in similar ways.

Snake robots or “snakebots” are especially valuable in search-and-rescue operations. They come in a variety of shapes and sizes, ranging from 20-30-foot-long snakebots that work on the ocean floor to tiny medical snakebots used inside the human body for surgical procedures.

Traditional snakebots move using snake-like motions such as sidewinding and lateral undulation. But the next-generation snakebots are more modular in design, consisting of a series of independent modules that are connected and programmed to work together. This redundancy allows them to continue to function even if several modules are destroyed.

New advances in actuators, motion planning algorithms, force feedback, and modularity are taking snake robots to a higher level of complexity and functionality. Next-generation snake robots emerging from Carnegie Mellon University, Stanford University, and Worcester Polytechnic Institute labs are leading the pack.

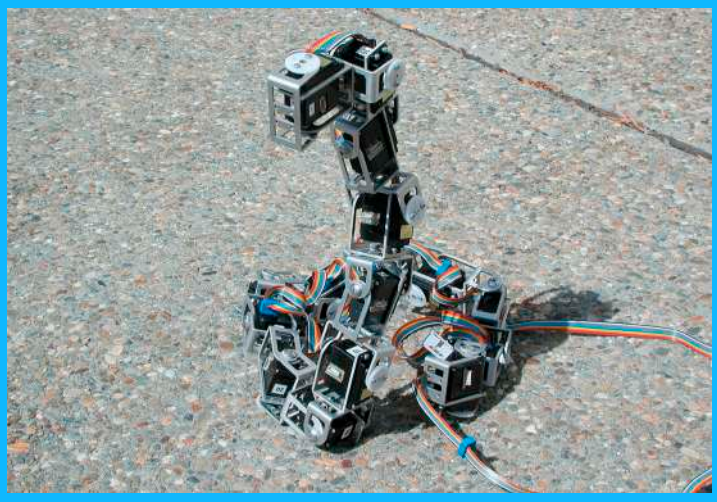
Modular Snakebots

Carnegie Mellon University's Robotics Institute is considered by many to be the home of snake robot design and development. CMU engineers have made advances in force-sensing technology so the robot can determine how tightly it needs to wrap around an object in order to cling on—eliminating the need to preprogram the robot based on "best-guess" conditions of its operational environment. These robots are of modular design, where segments or modules can be added or subtracted to change its length. Each module is a series-elastic actuator packed with sensors that enable controllable position, velocity, and sensitive torque control, as well as three axis inertial measurement. With six legs connected to a rectangular body, CMU's "Snake Monster" robot is actually not a snake. The legs, however, move with snake-like action. The actuators measure and regulate the force it exerts, as well as the forces upon it.

"The joints in the leg 'feel' the force of the robot being pushed and then, in an effort to zero-out the force it feels, the robot walks in the direction it is being pushed," says CMU professor of robotics Howie Choset. The force feedback allows for very simple controls that can adapt to a wide range of terrains. "When the robot goes over bumpy terrain, the series elastic actuators allow us to not perfectly plan the footsteps, but rather let the robot automatically conform to the environment the way animals do," he says.

Stanford University and University of California, Santa Barbara engineers have developed a snake-like robot that extends like a vine by squeezing through hard-to-reach places. The robot is deployed as a rolled-up inside-out tube, with a pump on one end and a camera on the other.

Once initiated, the device inflates with air and grows in the direction of the camera, while the other side stays anchored. A control system that differentially inflates the body can make the robot turn right or left. A software system makes direction decisions based on photographs transmitted from the tip of the robot.



"The body lengthens as the material extends from the end, but the rest of the body doesn't move" says Elliot Hawkes, assistant professor in the mechanical engineering department at the University of California, Santa Barbara, who is part of the research team. "Its surface does not move with respect to the environment, meaning that there is no friction with the surface over which it is moving. The body can be stuck in the environment, but that doesn't stop the robot because the tip can continue to progress as new material is added to the end." The research team tested the robot in a series of cluttered environments consisting of obstacles like sticky glue, nails, and other debris. "It was very nearly impossible to stop in these environments," adds Hawkes. "We piled all kinds of things in front of it, and it always finds a way through."

Researchers are planning to design newer models that will use tougher external materials, such as Kevlar. It may also be possible to extend the robot by using pressurized liquid instead of air, which would also be a way to deliver water to trapped victims, or for extinguishing fires within the rubble.

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"Most good programmers do programming not because they expect to get paid or get adulation by the public, but because it is fun to program.

~Linus Torvalds

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