

ELON MUSK UNVEILS WORKING NEURALINK CHIP THAT CONNECTS BRAIN DIRECTLY TO COMPUTER -

from 2 page.

Neuralink, which was founded by Musk and a team of engineers and scientists in 2016, unveiled an earlier, wired version of its implant technology in 2019. It had several modules: the electrodes were connected to a USB port in the skull, which was intended to be wired to an external battery and a radio transmitter that were located behind the ear. The latest version consists of a single integrated implant that fits in a hole in the skull and relays data through the skin via a Bluetooth radio. The wireless design makes it seem much more practical for human use but limits the bandwidth of data that can be sent, compared with state-of-the-art brain-computer interfaces.

The company's goal, Musk said in the demo, is to "solve important spine and brain problems with a seamlessly implanted device"—a far cry from his previously stated, much more fantastic aim of allowing humans to merge with artificial intelligence. This time Musk seemed more circumspect about the device's applications. As before, he insisted the demonstration was purely intended as a recruiting event to attract potential staff.

Neuralink's efforts build on decades of work from researchers in the field of brain-computer interfaces. Although technically impressive, this wireless brain implant is not the first to be tested in pigs or other large mammals. About a decade ago Brown University scientists David Borton and Arto Nurmikko and their colleagues developed a wireless neurosensor that was capable of recording neural activity from pigs and monkeys. In 2016 the researchers showed it could be used to help paralyzed monkeys walk.* "Neuralink, with a lot of creativity, has been able to cut and paste a lot of stuff that the field has developed," Nurmikko says. The technology may not be unique, he adds. But "might it have a robust future in terms of actually getting into humans? That's kind of the pending question, and the answer could very well be yes."

Musk and Neuralink are devoting significant resources to their project. "It is an extremely well-funded, focused effort. They said they have 100 people working on this," says Ken Shepard, a professor of electrical and biomedical engineering at Columbia University. "That's a level of resources that is pretty impressive to work on something like this. I think that gives them a real advantage over other groups."

Neuralink's robotic technology for inserting flexible electrodes is very notable, Shepard says. There will be challenges in scaling up the number of polymer electrodes, or "threads," and the interconnections between them and the integrated circuit chip, he says. The data bandwidth will also have to increase: recording from 1,000 electrodes yields a large amount of information, so Neuralink must compress it to relay it over Bluetooth.

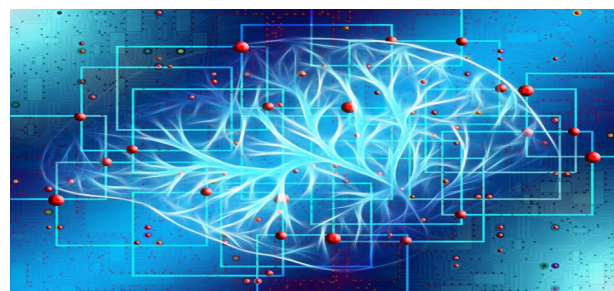
The U.S. Food and Drug Administration recently granted Neuralink a "breakthrough device" designation, which essentially means the company has submitted the paperwork to start the process of gathering the data necessary for FDA approval. There are numerous challenges to overcome before the device could be ready for human use, however. It will have to be shown to be safe and not cause any damage to brain tissue. And its sensitive electronics must be able to withstand the corrosive environment of the human body.

Neuralink is not the only company venturing into the realm of brain-computer interfaces. An Austin-based company called Paradromics—funded by the U.S. government's Defense Advanced Research Projects Agency—is also developing one potentially capable of recording signals from tens of thousands of neurons. The project aims to restore communication to people with paralysis who have lost the ability to speak or type. And the Culver City, Calif.-based company Kernel is developing a helmetlike device for monitoring brain signals noninvasively, which can be used to do things such as identify what song a person is listening to. It lacks the resolution of Neuralink's device and similar implanted systems but has the benefit of not requiring brain surgery.

Still, devices such as Neuralink's will likely be made less invasive over time as electrodes become thinner and more flexible and as robotic insertion becomes more streamlined. Musk has previously compared the process to LASIK

- Mr. O.S.Vastre (SYCO)

Advancing Artificial Intelligence Research -



The broad applicability of artificial intelligence in today's society necessitates the need to develop and deploy technologies that can build trust in emerging areas, counter asymmetric threats, and adapt to the ever-changing needs of complex environments.

As part of a new collaboration to advance and support AI research, the MIT Stephen A. Schwarzman College of Computing and the Defense Science and Technology Agency in Singapore are awarding funding to 13 projects led by researchers within the college that target one or more of the following themes: trustworthy AI, enhancing human cognition in complex environments, and AI for everyone. The 13 research projects selected are highlighted below.

"SYNTHBOX: Establishing Real-World Model Robustness and Explainability Using Synthetic Environments" by Aleksander Madry, professor of computer science. Emerging machine learning technology has the potential to significantly help with and even fully automate many tasks that have confidently been entrusted only to humans so far. Leveraging recent advances in realistic graphics rendering, data modeling, and inference, Madry's team is building a radically new toolbox to fuel streamlined development and deployment of trustworthy machine learning solutions.

"Next-Generation NLP Technologies for Low-Resource Tasks" by Regina Barzilay, the Delta Electronics Professor of Electrical Engineering and Computer Science; and Tommi Jaakkola, the Thomas Siebel Professor of Electrical Engineering and Computer Science. In natural language technologies, most languages in the world are not richly annotated. This lack of direct supervision often results in inaccurate, indefensible, and brittle

- Mr. P.S. Bhandare (Lecturer)



SVERI's COLLEGE OF ENGINEERING (POLYTECHNIC), PANDHARPUR

Department of Computer Engineering

CompLit

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In Touch with Tomorrow...

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Issue 01

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Department Vision

To be recognized as one of the best computer engineering department in Maharashtra providing core knowledge and skills along with professional ethics enabling students to reach higher goals.

Department Mission

1. To impart value based Technical Education in Computer Engineering.
2. To support for technical knowledge of students in the field of Computer Engineering.
3. To make the students efficient in various skill Sets in Computer Engineering.
4. To encourage students for life-long learning.

GIS (Geographical Information System) Software-

A warm welcome to everyone. We live in a green society, everywhere around our local area we do see farming, because that is what is considered most important in our Maharashtra, we spread over 307,713 km² (118,809 sq mi) on land, which makes us the third-largest state by area in India. We are considered to be the leaders in agriculture and industrial production.

Being a student studying in computer engineering department, we are always been looking for new technologies that are making life easy for people. In this article, I will be just introducing you with one of the most used geographical assistance software in farming industry. Here I introduce you to Geographic Information System (GIS Software), which is designed to store, retrieve, manage, display, and analyze all types of geographic and spatial data. GIS software lets you produce maps and other graphic displays of geographic information for analysis and presentation. **What is GIS Mapping Software?** GIS software lets you produce maps and other graphic displays of geographic information for analysis and presentation. With these capabilities a GIS is a valuable tool to visualize spatial data or to build decision support systems for use in your organization. A GIS stores data on geographical features and their characteristics. The features are typically classified as points, lines, or areas, or as raster images. On a map city data could be stored as points, road data could be stored as lines, and boundaries could be stored as areas, while aerial photos or scanned maps could be stored as raster images.

Geographic Information Systems store information using spatial indices that make it possible to identify the features located in any arbitrary region of a map. For example, a GIS can quickly identify and map all of the locations within a specified radius of a point, or all of the streets that run through a territory. In addition to the above capabilities, Maptitude implements a professional-strength relational database, a feature critical for GIS software. Attribute data may be freely joined to and detached from geographic layers and tables. Relational data manipulation is integrated with robust and powerful geoprocessing for spatial queries, polygon overlay, and other location-based analyzes. This is supported seamlessly.

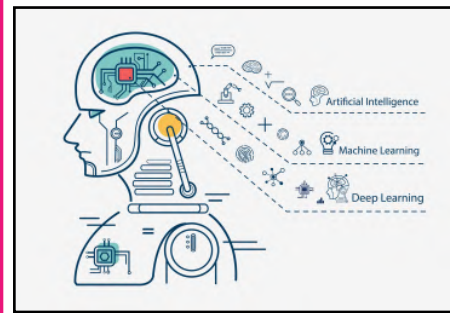
- Ms. R. D. Ghodake (TYCO)

HOD Message

It is our pleasure to present News Letter "CompLit" of our department. This news letter is one of the ways in which we can disseminate the information about our department. Due to pandemic situation in the last semester lectures conducted online. We celebrated different functions online and our students have attended different online workshops and completed online 'Coursera' courses also. As you read through pages, you will realize that we have succeed in academics as well as participated in different co-curricular activities.

-Mr. A.S.

What is Machine Learning?



“Machine Learning is defined as the study of computer programs that leverage algorithms and statistical models to learn through inference and patterns without being explicitly programmed. Machine Learning field has undergone significant developments in the last decade.”

With machine learning algorithms, AI was able to develop beyond just performing the tasks it was programmed to do. Before ML entered the mainstream, AI programs were only used to automate low-level tasks in business and enterprise settings.

This included tasks like intelligent automation or simple rule-based classification. This meant that AI algorithms were restricted to only the domain of what they were processed for. However, with machine learning, computers were able to move past doing what they were programmed and began evolving with each iteration. Machine learning is fundamentally set apart from artificial

intelligence, as it has the capability to evolve. Using various programming techniques, machine learning algorithms are able to process large amounts of data and extract useful information. In this way, they can improve upon their previous iterations by learning from the data they are provided.

We cannot talk about machine learning without speaking about big data, one of the most important aspects of machine learning algorithms. Any type of AI is usually dependent on the quality of its dataset for good results, as the field makes use of statistical methods heavily. Machine learning is no exception, and a good flow of organized, varied data is required for a robust ML solution. In today’s online-first world, companies have access to a large amount of data about their customers, usually in the millions. This data, which is both large in the number of data points and the number of fields, is known as big data due to the sheer amount of information it holds.

Big data is time-consuming and difficult to process by human standards, but good quality data is the best fodder to train a machine learning algorithm. The more clean, usable, and machine-readable data there is in a big dataset, the more effective the training of the machine learning algorithm will be.

Types of Machine Learning.

- Supervised learning
- Unsupervised learning
- Reinforcement learning

Supervised learning

Supervised learning as the name indicates the presence of a supervisor as a teacher. Basically supervised learning is a learning in which we teach or train the machine using data which is well labeled that means some data is already tagged with the correct answer. After that, the machine is provided with a new set of examples(data) so that supervised learning algorithm analyses the training data(set of training examples) and produces a correct outcome from labeled data.

Unsupervised learning

Unsupervised learning is the training of machine using information that is neither classified nor labeled and allowing the algorithm to act on that information without guidance. Here the task of machine is to group unsorted information according to similarities, patterns and differences without any prior training of data.

Reinforcement learning

Reinforcement learning is an area of Machine Learning. It is about taking suitable action to maximize reward in a particular situation. It is employed by various software and machines to find the best possible behavior or path it should take in a specific situation. Reinforcement learning differs from the supervised learning in a way that in supervised learning the

- Ms. J.C. Sonvane (TYCO)

ELON MUSK UNVEILS WORKING NEURALINK CHIP THAT CONNECTS BRAIN DIRECTLY TO

Last week Elon Musk’s brain tech start-up Neuralink unveiled the latest version of its neural implant technology. In characteristic Musk style, the billionaire CEO of SpaceX and Tesla announced the news during a widely hyped livestreamed event in which he showed off the implant’s functionality in several pigs. The device is about the size of a large coin and can be fully embedded in the skull. Attached to it are 1,024 threadlike, flexible electrodes that extend down into the cerebral cortex, the outer layer of the brain responsible for numerous functions, including motor control and sensory feedback. A customized computer chip in the device amplifies signals from the cortex and wirelessly relays them to a nearby computer. The electrodes are carefully inserted by a surgical robot and are capable of recording (and, theoretically, also generating) the tiny electrical signals, or “spikes,” produced by individual neurons. The idea is that these signals could be used to one day do things such as

restore movement to people who are paralyzed or create a visual prosthesis for blindness. During Musk’s demonstration, he strolled near a pen containing several pigs, some of which had Neuralink implants. One animal, named Gertrude, had hers for two months. The device’s electrodes were situated in a part of Gertrude’s cortex that connected to neurons in her snout. And for the purposes of the demo, her brain signals were converted to audible beeps that became more frequent as she sniffed around the pen and enjoyed some tasty treats. Musk also showed off a pig whose implant had been successfully removed to show that the surgery was re-



Paper Publication



Techno societal 2020 Conference Springer Publication

SR. NO	Name of Staff	Title in Paper
1	Mr. P.S. Bhandare, Mr. S.S Bhimade, Mr. A.S. Bhatlavande	Bandobast Allocation & attendance System
2	Mr. M.K. Jadhav, Ms. V.V. Khandagale	OSS features ,scope and Challenges
3	Ms. J.S. Pawar	Use of AR for maintenance during pandemic
4	Mr. S.S Bhimade, Mr. P.S. Bhandare, Mr. A.S. Bhatlavande, Ms. B.M. Deokar	A secure data sharing platform using blockchain and fine-grained access
5	Ms. V.B Maskar, Mr. P.S. Bhandare, Ms. M.P. Pawar	Clustering of fruits image based on color and shape using Machine Learning.
6	Mr. A.S. Bhatlavande	Automated Early Detection of Diabetic Retinopathy



Our Achievements A.Y. 2020-21

SR. NO	Name Of the Student	Marks	Class
1	KOKARE AHILYA VITTHAL	97.25%	FYCO
2	KASHID NILESH DHANAJI	96.88%	FYCO
3	SALUNKE SAURABH SATISH	96.38%	FYCO
4	KSHIRSAGAR PRAJAKTA CHANDRAKANT	96.13%	SYCO
5	PAWAR NUPUR NILESH	96.00%	SYCO
6	PAWALE AKANKSHA GANESH	94.93%	SYCO
7	KATKAMWAR YASH VIVEK	99.76%	TYCO
8	GUND PRATIKSHA PANDIT	99.06%	TYCO
9	RANPISE PRITI PANDIT	98.94%	TYCO



Editorial

It gives me great pride to present to you this issue of our departmental Newsletter. Newsletter is an amalgamation of all the events held in the department and it has an instrumental role in providing a greater exposure of the achievements accomplished by the students and the faculty.

Thank You all

Faculty Co-coordinator: Ms. Pawar J.S.
Student Co-coordinator: Mr. Gawali S.L.