

Abstract :

The Hybridization of the Human with Brain Implants: The Neuralink As the days are passing by, we come across new and latest inventions which use Artificial Intelligence to ease our usage of the devices. This sudden surge in the usage of AI has increased insecurity among humans that it can leave us of no use. This increased insecurity led people to think what can be done to make our future secure among the robots and artificial intelligence. And out came the solution, mix both the intelligences and achieve a symbiosis between human and AI. To achieve this, we can use the “Neural Lace” technology as well as Brain-Machine Interface (BMI). The paper will discuss the use of Brain-Machine Interface, Artificial Intelligence and Neural Network to achieve symbiosis with AI along with the company that is making all this possible, Neuralink, which is an Elon Musk startup which has a vision to cure the insecurity among us.

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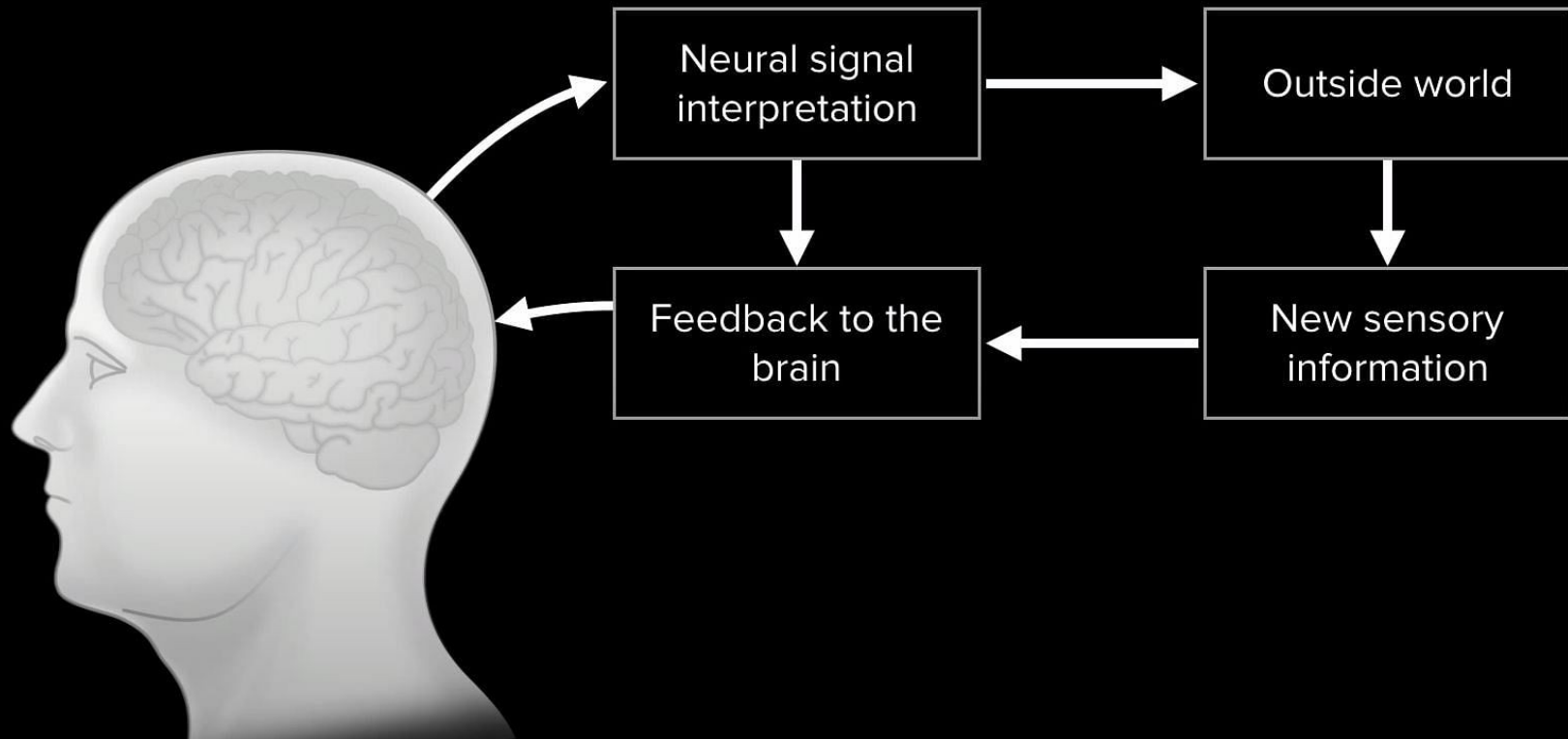
INTRODUCTION

- As the days are passing by , we come across new ideas and new technologies , inventions and innovations .
- As now a days the usage of artificial intelligence have been increased.
- This sudden surge in the usage of AI has increased the insecurity among humans that it can leave us of no use.
- And there come an out come of a solution, which mixes both intelligences (tech and humans) achive a symbiosis between human and AI.
- To achive this, we can use the “neural lace” technology as well as Brain-Mechine Interface (BMI).

Concepts Used

- Brain-Machine Interface (BMI)
- Brain –Machine Interface (BMI) or Brain to Machine interface (B2M) is an interface where we can connect ourselves to machine which is capable of reading the inputs directly from our brain.
- Brain machine interfaces holds the power to help the people with a wide range of clinical disorders such as dis-functional sensory and motor functions.

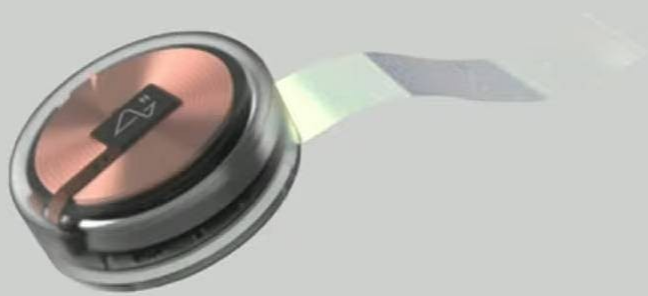
BRAIN-MACHINE INTERFACES

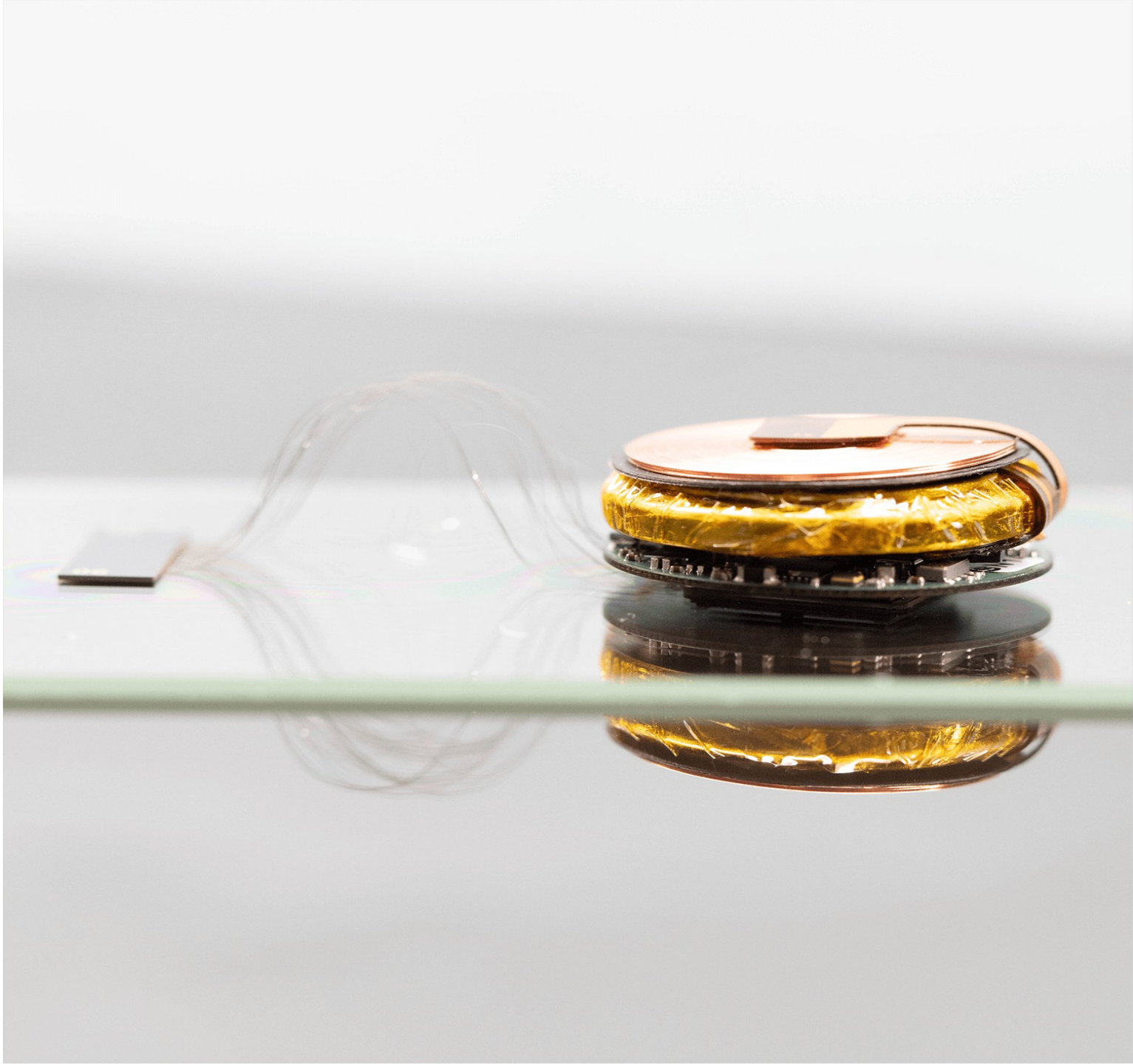


WHAT IS NEURALINK?

- **Neuralink is a device that will be surgically implanted into your brain and with it, you'll be able to communicate with machines and even control them.**
- **It will also help study the electrical signals in the brain and arrive at solutions that can help cure various medical problems.**
- **Neuralink a chipset, called N1 chipset, will be installed in your skull which is 8mm in diameter and has multiple wires housing electrodes and insulation for the wires.**
- **These wires will be surgically placed inside your brain using a robot. As per the company, the wire is as thick as the neurons in your brain and thinner than a strand of hair at 100 micrometres. To compare, imagine the diameter of your hair, and then divide that diameter by ten.**

THE LINK







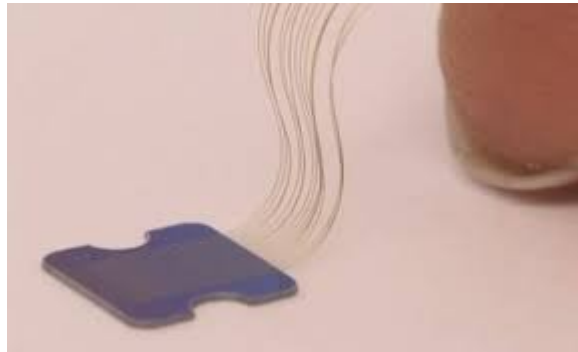
HOW DOES NEURALINK WORK ?

- **Creation of threads**
- **Sticching of threads into tissues**
- **Reading the signals and clearing them**
- **Transmission of signals to amplifier**
- **Amplification of signals and transmission to the machines**

Threads :

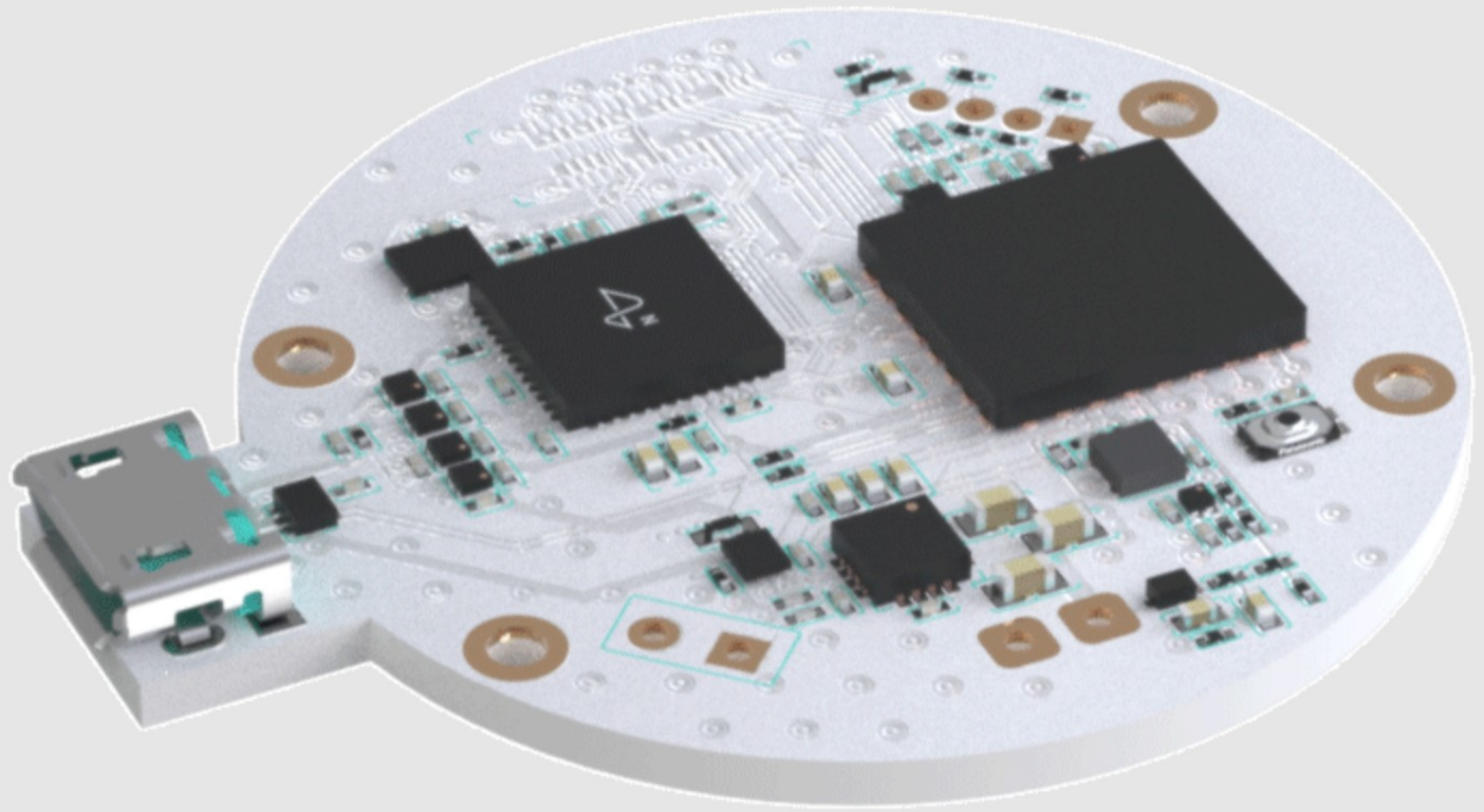
- Threads are the ultra thin ,flexible polymers which will contain the electrodes and will transfer the information and signals to the transmitter .
- These threads (4-6 micro meters) are thinner than the hair (which is 17 micro meters thin) and have a length of 20 micrometers.
- Injecting this type of 1,024 electrodes threads into the outside layer of the brain avoiding any veins or arteries.
- These electrodes communicate with the brain cells which are connected to a Bluetooth link that goes straight to the outside of computing device.

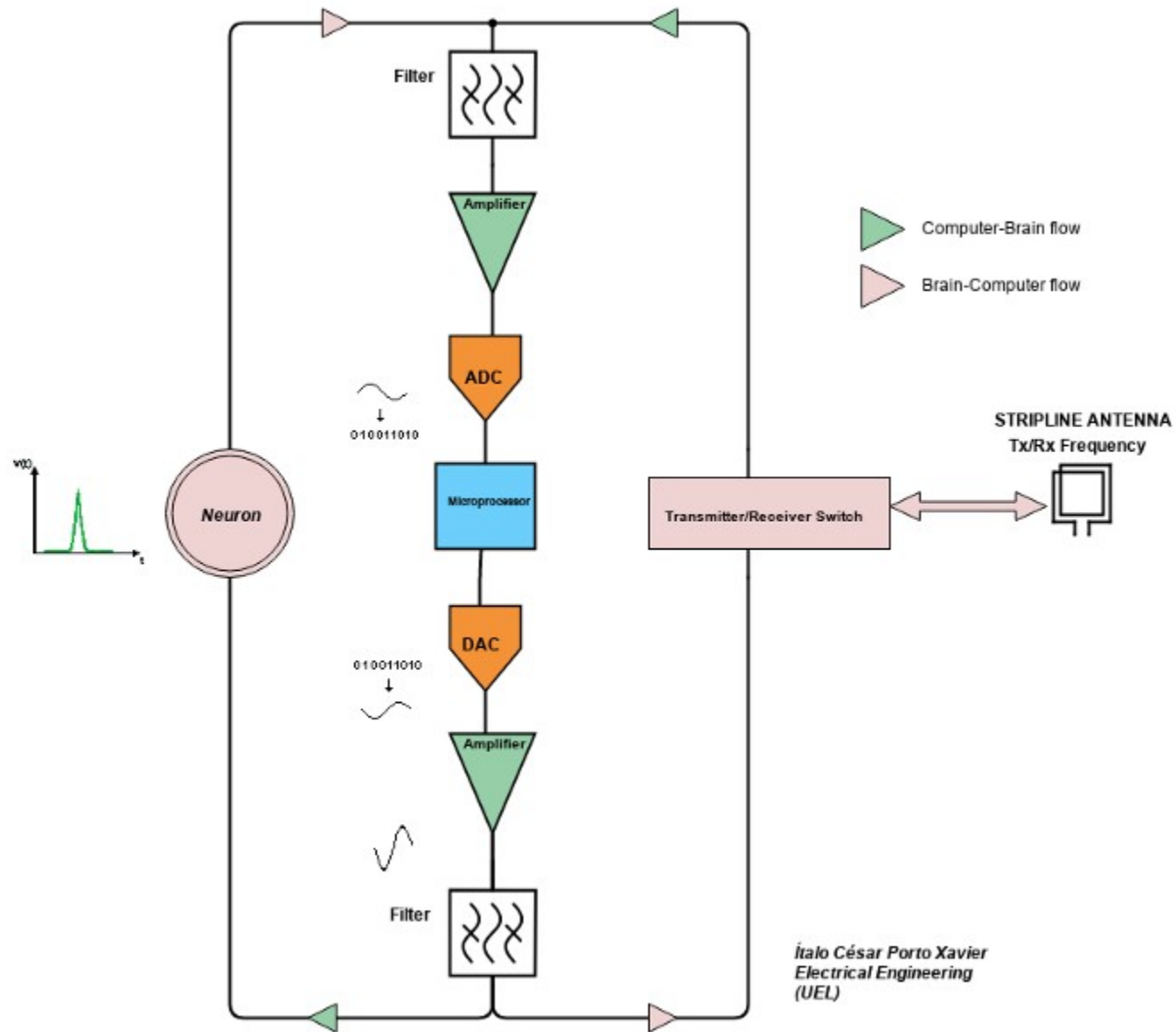




AMPLIFIER

The electrodes are built around the neuralink's custom application specific integrated circuit (ASIC) , which consists of 256 individually programmable amplifier (analog pixels), on-chip analog to digital converters (ADC) , and peripheral control circuitry for serializing the digitized outputs.





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How Will Neuralink Be Installed

Since we're talking about drilling a hole into your skull and inserting wires into your brain there are a lot of reservations among people.

Which is why Neuralink will be using its specially developed robots to carry out the quick and precise insertion of the device into the cortex. The company said it will work in accordance with the regulations by health ministries while carrying out the operation to ensure it is safe.

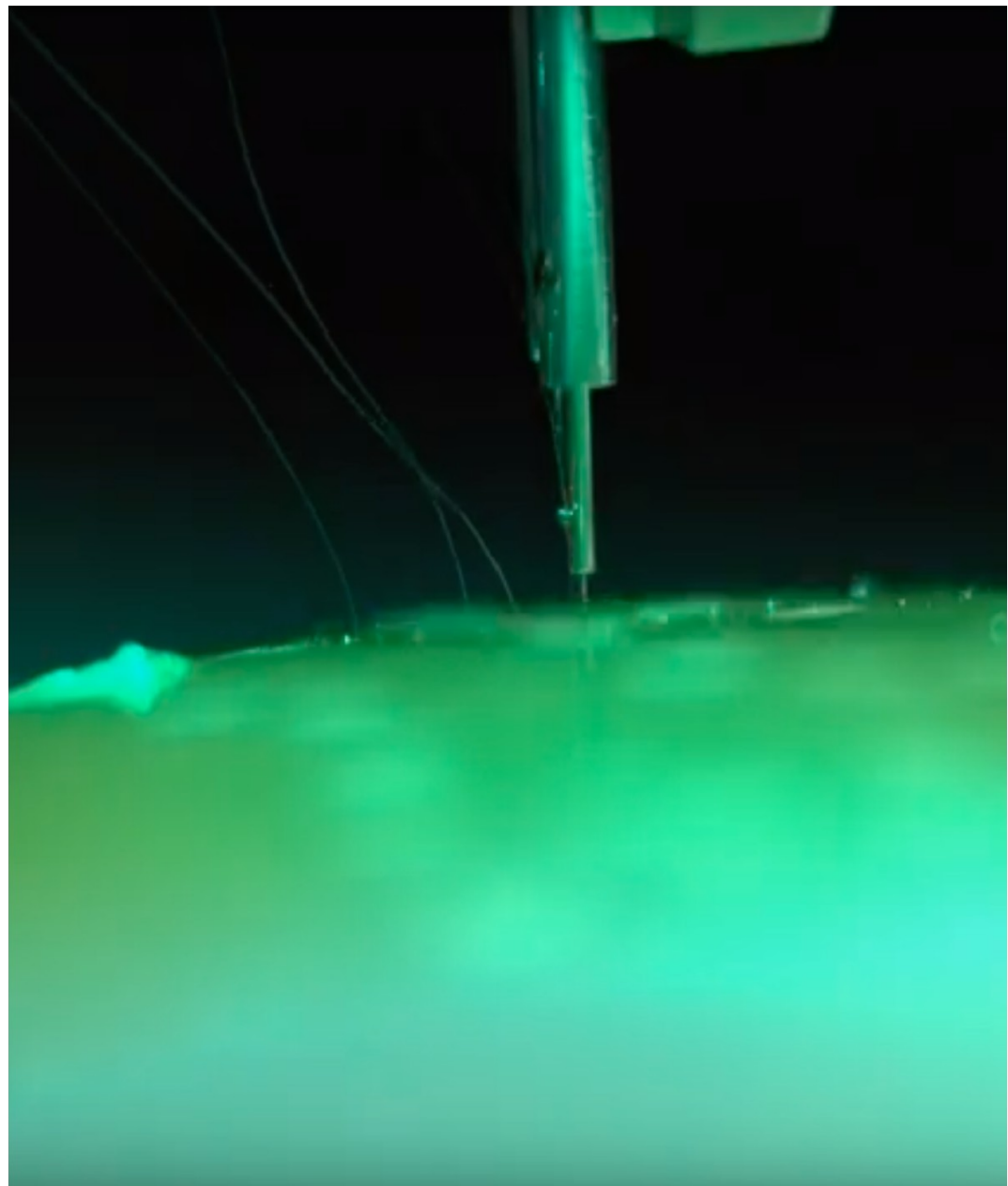
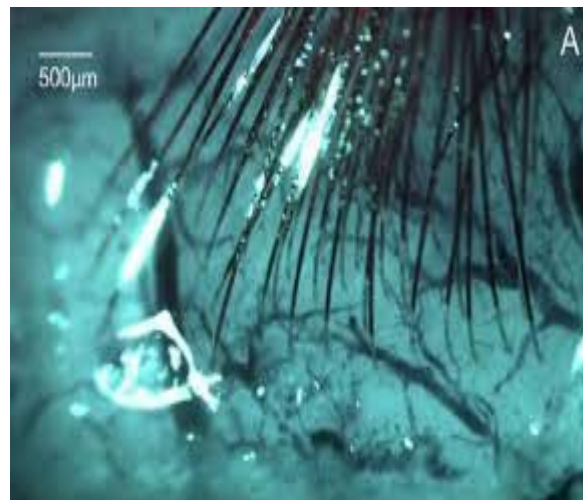
The Neuralink robot will insert the module into your brain using a microscope and needles the size of 24 microns (a micron is one-millionth of a meter). These needles are so small that you can't easily spot them with the naked eye.

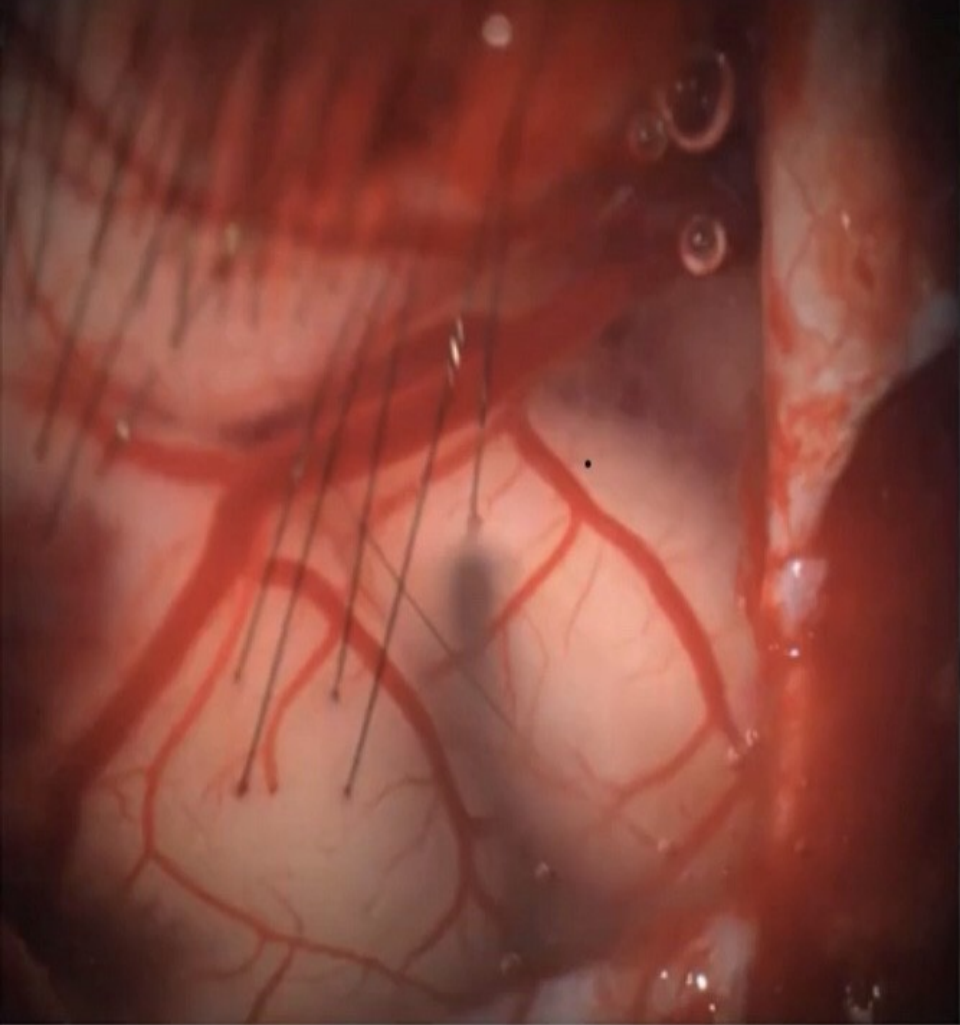
As per the company, there could be 10,000 electrodes inserted into the brain.

The robot has been designed to ensure that the device is inserted into the brain without touching any veins or arteries. Each electrode will be inserted specifically bypassing any kind of blood vessel.

The operation will require a 2mm incision which will be dilated up to 8mm. After the procedure is complete the exposed part of the skull will be covered with the chipset module.







How does it look like

LINK V0.9

1024 channels per Link

23 mm x 8 mm

Flush with skull (invisible)

6-axis IMU, temperature, pressure, etc.

Megabit wireless data rate, post compression

All day battery life



PROS AND CON'S :

Advantages of Neuralink

Some of the most anticipated pros of the neuralink are curing paralysis, treating mental illness, to stream music straight into your head, and extending the range of sight and hearing

You might also be able to download skills and other files directly into your brain.

It is completely ready yet to be able for performing such advanced operations. Although, by looking at the growth and development over time, we can make out that it is not very long when we can control our mobile phones, computers just by thinking.

Neuralink recently showcased their experiment of 'the link' in three pigs. This experiment shows that living beings will perform normally after installing the chip into their brain. The device can also be removed and no harm would be caused

Some interesting things you probably didn't know about Neuralink

Long term goals can bring a huge difference in our daily life. It can be used to perform many more things rather than just operating our devices. You can seamlessly be connected to a computer or create a virtual world, download stuff into your brain, gain multitasking capabilities.

Neuralink might be able to cure most of the dangerous diseases such as

Autism

Paralysis

Memory loss

Brain damage and addiction

Blindness

Depression

Anxiety

Seizures

Strokes

Hearing loss

Disadvantages of Neuralink

Despite how strong and powerful the chip might be, it is still a piece of electronics/ technology. It might always have a probability of malfunctioning.

When the **neuralink** is completed, and people start using it, the cases of advanced hacking might increase and produce new threats like Mind hacking, Mind high jacking. In simple words, anonymous people can read your mind and also be able to alter it according to their will.

Privacy, Security will be the biggest concern.

Ethical concerns and questions will arise around people whether they should opt for **neuralink** or not.

Conclusion

It seems that AI is a double-edged sword, it could be our salvation and our doom. One thing is certain, there's no way of stopping it at this point. All reports point to Artificial intelligence evolving at a faster rate than we initially anticipated. We can only hope that humanity doesn't collectively , but instead manage to merge to make good use of this powerful technology.

THANK YOU