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Khomchenko D., Beznis Y.

NeuraLink

Belarusian National Technical University
Minsk, Belarus

Neuralink is a United States-based neurotechnology development company founded by Elon Musk, the company is engaged in the design and manufacture of implantable neurocomputer interfaces. Neuralink is a company that develops neurochips that aim to treat diseases of the central nervous system and improve people over the long term [1].

Before that, there were already companies involved in the development of neurochips. Let's compare the characteristics of some components of these chips using the example of Utah Array. The thickness of the electrodes inserted into the brain: for Utah Array Electrode is 100 mkm and for Neuralink Electrode is 4 mkm. They differ in diameter by a factor of 25. In addition, the Neuralink electrodes are not made of metal, but of special flexible polymeric organic materials. The flexibility allows you to better protect the brain when the electrodes start to move, the size is small enough not to damage it.

The company has developed a special robot that inserts electrodes into the brain, since no surgeon can manually insert them into the brain due to their small size. According to Elon Musk, the surgery to implant a chip in the brain will take no more than an hour, and patients will be able to leave the hospital themselves within a day of the surgery.

The chip also has an advantage in communication and performance. For example, at the first demonstration a device with USB Type-C was presented, and at the presentation, which took place in the summer of 2020, a completely wireless

implant was demonstrated, which can communicate with devices via Bluetooth and is also equipped with inductive charging [2].

All the electronics are on a 23mm x 8mm chip, and the chip itself is called «Link». Another advantage is the number of contacts. Let's compare their number with the number of contacts of the «Utah Array» mentioned above: Utah array lead = 100 and Neuralink lead = 1024. This number of contacts allows getting more information from the brain, but even with a hundred contacts, one person can control a robotic arm.

The most successful presentation so far is the 2020 presentation with three pigs. The first pig was a regular pig, the second pig was chipped, and then the third pig was removed with the link chip. Through recording, modeling and computer processing of brain signals, they were able to predict the movements of each joint of the pig, real-time diagrams of joint movements and predicted diagrams were demonstrated, their difference was very small.

In the future there arises the possibility to control person's thoughts, feelings and actions. Elon Musk said it was possible to hear music in his head. Really important opportunities will be the ability to predict and prevent stroke, hearing, vision, movement disorders, multiple sclerosis and the treatment of hundreds of other diseases. Special interfaces can also be controlled with the power of thought.

References:

1. Neuralink [Electronic resource]. – Mode of access: <https://ru.wikipedia.org/wiki/Neuralink/>. – Date of access: 30.03.2022
2. Что такое Neuralink? Разбираю технологию [Electronic resource]. – Mode of access: https://ikabu.ru/story/chto_takoe_neuralink_razbirayu_tekhnologiyu_8017177/. – Date of access: 30.03.2022