Elon Musk Is Creating Cyber Pigs

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Elon Musk showed off his latest efforts to let you control a computer with your brain by showing a pig fitted with implants.

The pig was part of a Friday demo from Neuralink, a company Musk started to create the upcoming brain-to-computer interface. The hog, named Gertrude, happily roamed a feeding pen and ate food, even with an implant placed inside her snout.

The implant itself contains hundreds of tiny threads – each smaller than a human hair – to act as electrodes, which can detect brain signals. In the case of the Gertrude, Neuralink is using the implant to read the pig's neural activity as the animal performs certain actions, like smelling, eating, and walking.

"Whenever she shuffles around and touches something with her snout, that sends out neural spikes, which are detected here," said Musk, who later added: "She's had the implant for two months."

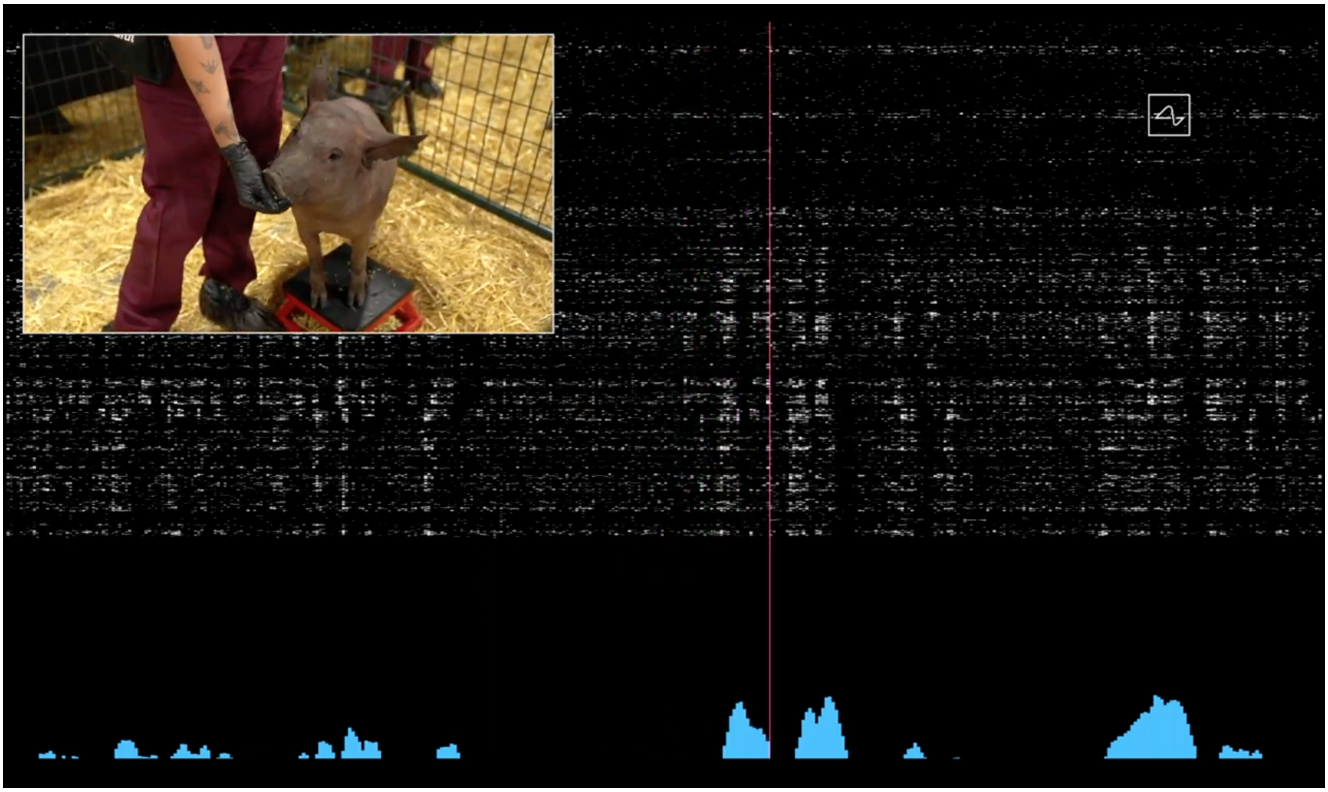


Image Credit: Neuralink via PCMag

Another pig, named Dorothy, was also shown. The porker previously had an implant, but Neuralink removed it to show that the animal was fine, despite the past surgery. “What Dorothy illustrates is you can put in the Neuralink, remove it, and be healthy and happy, and indistinguishable from a normal pig,” Musk said.

Musk introduced his “little pigs” demo to show how the implants can be surgically added to live subjects without any detriment to their health. The same implants are also sturdy, and can continue functioning, even though pigs are often running around and head-butting each other.

His company has also been experimenting with not one, but two implants, in a trio of pigs. “We’ve been able to show you can have multiple Neuralinks implanted, and again, they’re healthy and happy, and indistinguishable from a normal pig,” Musk said.

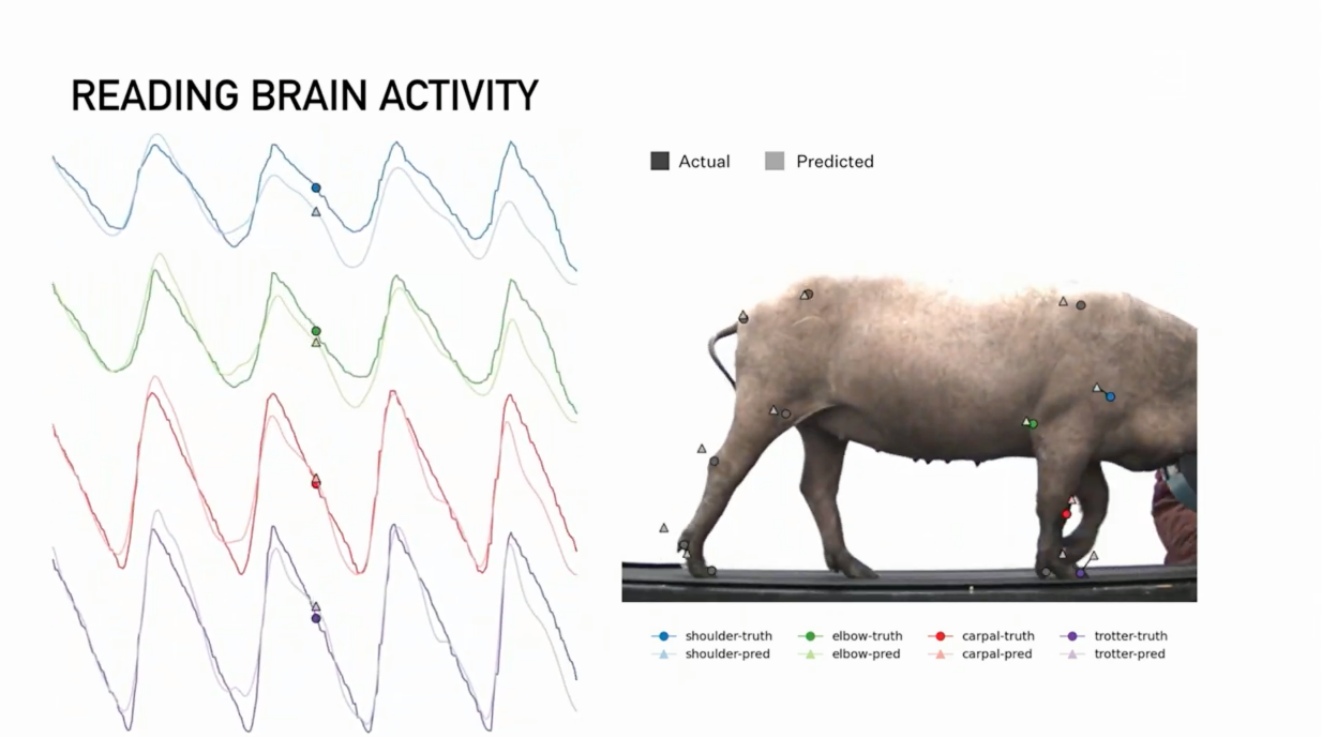


Image Credit: Neuralink via PCMag

So what does this all mean for controlling a computer with your thoughts? Well, according to Musk, the implants are accurate enough to read a pig's brain signals to determine how the neural activity will move the animal's joints. "With a wireless neural implant, we're actually able to predict the position of all of the limbs in the pig's body," Musk added.

Unfortunately, no pigs were trained to wirelessly control a computer mouse or keyboard during the live demo. But Musk revealed the company has changed how the implant will be attached to human wearers.

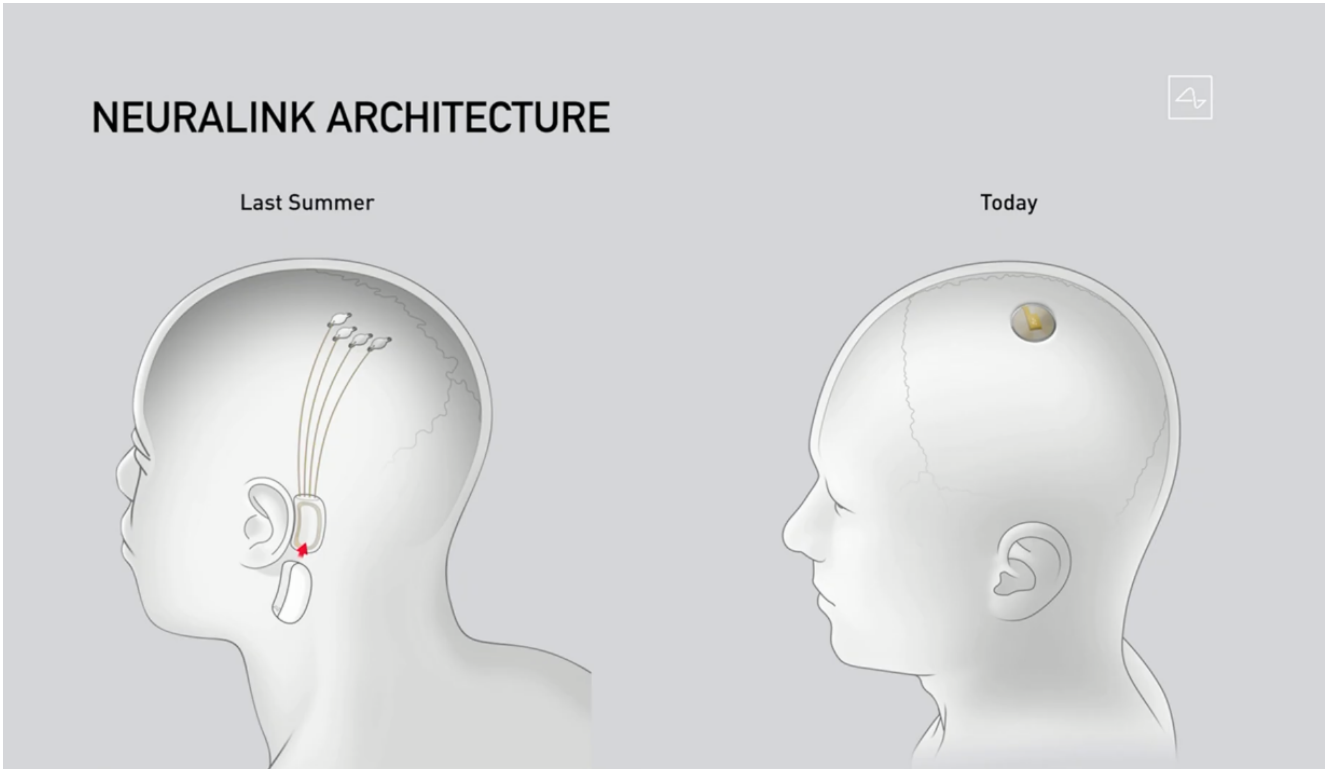


Image Credit: Neuralink via PCMag

Originally, Neuralink envisioned the implant being placed behind your ear. But now the company says the implant will be small enough to be inserted on top of your skull, making it practically invisible under your hair. (If you're bald, the scar should be pretty small.)

"We've simplified this to something about the size of a large coin," Musk said. "It goes in your skull, replaces a piece of skull. And then the wires connect within a few centimeters, about an inch of the device."

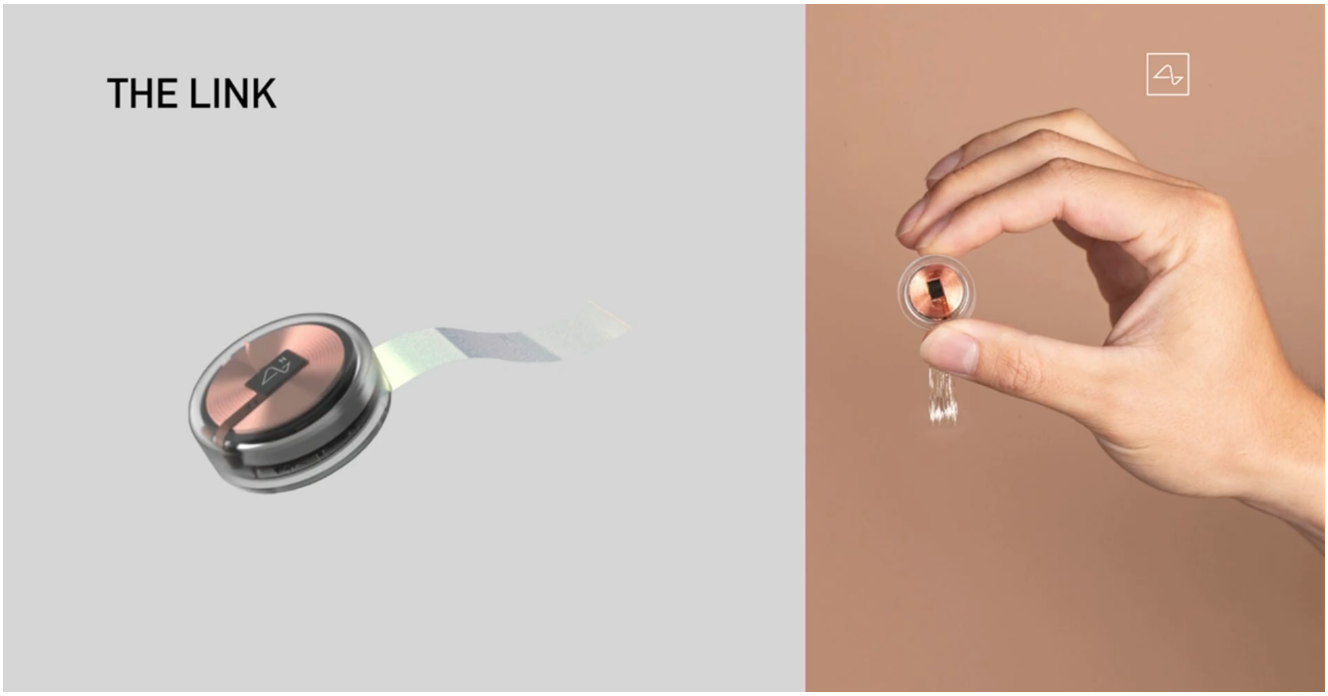


Image Credit: Neuralink via PCMag

“It’s like a Fitbit in your skull with tiny wires,” he added, noting the implant itself will charge its battery like a smartwatch does. “So you can use it all day, and charge it at night, and have full functionality,” Musk said.

The implant will then talk to your smartphone via Bluetooth, and potentially other devices, such as a mouse and keyboard, enabling you to control each product with your thoughts. This will involve reading your brain signals to determine what actions you’re trying to make, and then translating the actions into computer commands.



Image Credit: Neuralink via PCMag

To surgically deliver the implant both safely and efficiently, the company is relying on a robot, which was also shown in the demo. The machine can intricately place the thread-like electrodes in your brain without puncturing a blood vessel for no noticeable damage.

The robot is being designed to complete each surgery in less than an hour. The process also promises to be painless, requiring no anesthesia.



Image Credit: Neuralink via PCMag

Musk added that Neuralink did receive a “breakthrough device designation” from the FDA back in July. His company is now preparing to implant a Neuralink device in the first human subject “soon,” pending further safety testing and the needed regulatory approvals.

The goal is to make the whole surgery process similar to a Lasik procedure to improve eyesight. “At first, it’s going to be quite expensive,” Musk said. “But that price will very rapidly drop… I think inclusive of the automated surgery we want to get the price down to a few thousand dollars. Something like that.”

Musk hosted Friday’s demo to also recruit new people to join Neuralink, which is hiring. Currently, it employs 100 people. But during the event, Musk said the company could one day reach 10,000 employees.

The company is currently targeting the implant for paraplegic patients who can no longer use their limbs. But the brain-to-computer interface could lay the foundation for wilder sci-fi-like concepts found in films such as *The Matrix* and *Ghost in*

the Shell. During a Q&A session, Musk raised the possibility of converting your memories into computer code, which could then be downloaded into a new robot body.

“The future is going to be weird,” Musk said.

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