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Elon Musk demonstrated a Neuralink brain implant in a live pig

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4-5 minutes



Elon Musk, co-founder of Neuralink, led a demonstration of the brain implant technology on 28 August

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Elon Musk has showed off his company Neuralink's brain-computer interface for the first time. In an announcement on 28 August, Neuralink unveiled prototypes of its device and showed off pigs that had had the devices implanted in their brains.

The device resembles a coin with extremely thin wires coming from one side of it. It is designed to be implanted in the skull, with the wires embedded a few millimetres into the surface of the brain. Those wires can then [detect when neurons are firing](#), or emit their own electrical signals to make the neurons fire.

Musk showed a video of neurons responding to the electrodes.

Eventually, the hope is that these small devices will be able to

both read and write neuron signals, helping with medical problems that originate in the brain and spine, and maybe even allowing humans to integrate computers into their brains in the distant future, Musk said.

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The [Neuralink](#) team trotted out three pigs to demonstrate the device: the first, named Joyce, had no implant, and the second, named Gertrude, had an implant that monitored neurons in her snout. Musk displayed a screen showing live signals from Gertrude's Neuralink device as she rooted around in some hay, produced when she touched her snout to food or the ground.

The third pig, called Dorothy, had had an implant installed and then removed. "What Dorothy illustrates is that you can put in the Neuralink, remove it and be healthy, happy and indistinguishable from a normal pig," Musk said. This will be important for human users, he said, because they may want to remove or upgrade their implants.

"The challenging part that they've pulled off is that the animal is happy-looking and walking around and acting normal and the data is being relayed wirelessly," says Timir Datta-Chaudhuri at the Feinstein Institutes for Medical Research in New York.

"Other people that might have done something similar usually have the animal on an operating table under anaesthesia with wires coming from its brain."

While this is impressive, says Datta-Chaudhuri, it is still not quite enough to prove the devices are safe. Musk said that implantation can be done with relatively little bleeding in the brain. "You sort of think if you stab something with a wire surely it will bleed, but actually at a really small scale it does not," he

said.

“They downplayed the potential damage to the brain, but that damage is sometimes not easily observable even in humans, let alone pigs,” says Datta-Chaudhuri. “You don’t know if the pig now has a slur or the other pigs aren’t really socialising with it because it’s acting weird.”

During the announcement, members of the Neuralink team expressed their long-term hopes for the device, ranging from restoring vision for people with [eye injuries](#) and limiting pain to recording memories and telepathy.

Some of these goals are more realistic than others, says Datta-Chaudhuri. For example, Musk spoke about bypassing spinal injuries to restore movement for people who are paralysed, which he said will be the focus of the company’s first clinical trials in humans, beginning soon. Devices similar to Neuralink [have achieved this](#), so it isn’t outlandish to expect Neuralink to do the same.

On the other hand, a feat like reading a memory or thought would require a detailed understanding of the brain that we simply don’t yet have, with advanced technology to match, says Datta-Chaudhuri.

“I feel like there’s still a lot that they have to learn, and it’s going to be an uphill battle for them,” he says. “But this snowball might get rolling and turn into something bigger, simply because of the advantage of the brand and having Elon Musk attached to it, that social spotlight.”

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