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Commentary

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Brain Implants The Future of Thinking?

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Description

Brain implants, often referred to as neural implants, are technological devices that connect directly to a biological subject's brain – usually placed on the surface of the brain, or attached to the brain's cortex. A common purpose of modern brain implants and the focus of much current research is establishing a biomedical prosthesis circumventing areas in the brain that have become dysfunctional after a stroke or other head injuries.

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This includes sensory substitution , e.g. in vision . Brain implants involve creating interfaces between neural systems and computer chips, popularly called brain-machine interfaces . Some futurologists, such as Raymond Kurzweil , see brain implants as part of a next step for humans in progress and evolution , whereas others, especially bioconservatives, view them as unnatural , with humankind losing essential human qualities. It is argued that implants would technically change people into cybernetic organisms (cyborgs). Some people fear implants may be used for mind control, e.g. to change human perception of reality.

Almost two years ago, Dennis Degray sent an unusual text message to his friend. “You are holding in your hand the very first text message ever sent from the neurons of one mind to the mobile device of another,” he recalls it read. “U just made history.” Degray, 66, has been paralysed from the collarbones down since an unlucky fall over a decade ago. He was able to send the message because in 2016 he had two tiny squares of silicon with protruding metal electrodes surgically implanted in his motor cortex, the part of the brain that controls movement.

These record the activity in his neurons for translation into external action. By imagining moving a joystick with his hand, he is able to move a cursor to select letters on a screen. With the power of his mind, he has also bought products on Amazon and moved a robotic arm to stack blocks.

But while the Utah array has proved that brain implants are feasible, the technology has a long way to go. Degray had open brain surgery to place his. The system is not wireless – a socket protrudes from his skull through which wires take the signal to computers for decoding by machine-learning algorithms. The tasks that can be done and how well they can be executed are limited because the system only records from a few dozen to a couple of hundred neurons out of an estimated 88bn in the brain (each electrode typically records from between one and four neurons).

A brain (or neural) implant is a technological system that enables communication between the brain and electronic devices, thus permitting brain activity to be modified, recorded, and/or translated for the manipulation of devices such as a computer cursor or a robotic arm. The modification of brain activity, typically through electrical stimulation, has a number of medical applications, including the disruption of maladaptive brain activity that arises from neurological diseases such as epilepsy and Parkinson's disease, or the creation of new sensory pathways to assist, for example, the blind or individuals who have lost their sense of touch and body position.

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