Harnessing the Power of the Human Brain

The Center for Neural Engineering and Prostheses (CNEP)

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CURRENT RESEARCH

Developing technologies to treat neurological and neuropsychiatric conditions

A 15-year-old girl has a brain stem hemorrhage that has suddenly left her physically "locked in" - stuck in her body without the ability to move or speak. Although she cannot even blink her eyes to communicate, a scan reveals that her cerebrum is intact. After weeks of silence and immobility, Berkeley scientists deliver a specialized cap of electrodes in an attempt to help the girl communicate letters that spell words and essentially give voice to her thoughts. "The same brain regions are activated when you see or do something and when you imagine seeing or doing the same thing," explains Robert Knight, UC Berkeley professor of psychology and neuroscience. He explains that a girl, like the one who suffered from the brainstem hemorrhage, uses the same pathways in her brain when she is thinking of a word as when she actually says the word. After first analyzing the cortical readings - the brain response - to 50 of the words, they created a mathematical algorithm that was able to decode the remaining 50 words. This work lays the groundwork for future studies aimed at decoding imagined words that, if successful, could lead to a speech prosthesis.

Such neurological decoding, combined with BMI technology, has vast implications for millions of people around the world.

The Center for Neural Engineering and Prostheses (CNEP) is a cross-campus collaboration at the University of California Berkeley and San Francisco working to integrate cutting-edge engineering with world-class basic and clinical neurosciences to develop technology to restore sensory, motor, and cognitive function in patients suffering from disabling neurological conditions.

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AFFILIATION

University Of California, San Francisco

RESEARCH AREAS

Veteran's Causes, Life Science, Neurological / Cognitive

FUNDING REQUEST

Your contributions will help the Center for Neural Engineering and Prostheses develop innovative technology and move it from bench to bedside in order to help people living with sensorimotor, visual, speech, and cognitive impairments.