BCI/BBI

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BCI

A Brain-Computer Interface (BCI) is a technology that enables individuals to communicate directly with computers through neural activity. Sensors detect and record brain signals, which are processed and interpreted by algorithms, allowing users to control external devices through their thoughts without the use of traditional input methods.

FUTURE OF BCI

Brain-computer interfaces (BCIs) are being used to restore movement and speech to patients with severe impairments and to control drones and video games with thoughts. Advancements in electrode arrays are improving the resolution and functionality of BCIs, with potential for thousands of channels to be implanted in the brain. Sensory feedback integration is being explored to improve control over prosthetics and speech neuroprosthetics. Regulatory and ethical issues need to be addressed while prioritizing patients' needs.

BBI

A Brain-to-Brain Interface (BBI) establishes a link between the neural activities of two biological entities, such as humans and animals, mediated by computers. It enables bidirectional communication between brains, where one brain's signals can modulate the function of another brain without involving the peripheral nervous system. In a typical BBI setup, neural signals from one brain, detected using EEG, are translated into computer commands, which then stimulate specific brain areas in another individual via techniques like transcranial focused ultrasound (FUS). This process allows for the exchange of information and control between individuals, opening up possibilities for collaborative tasks, communication, and potential therapeutic applications.

FUTURE OF BBI

Advancements in technology such as improved EEG signal processing algorithms, high-resolution neuroimaging techniques, and precise brain stimulation methods are enhancing the accuracy, speed, and versatility of brain-computer interfaces (BBIs). As these technologies continue to evolve, BBIs have the potential to revolutionize our understanding of the brain and reshape human capabilities and interactions.

The Vagus Project
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https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3616031/