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NEURAL ENGINEERING AND BRAIN-COMPUTER INTERFACES: A NEW APPROACH TO MENTAL HEALTH

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ABSTRACT

Neural engineering and brain-computer interfaces (BCIs) are emerging as revolutionary tools in the field of mental health, offering innovative approaches to diagnosing and treating neurological disorders. By facilitating direct communication between the brain and external devices, BCIs enable real-time monitoring and modulation of neural activity, leading to potential breakthroughs in understanding conditions such as depression, anxiety, and schizophrenia. This technology integrates advanced neuroscience with machine learning algorithms, providing tailored interventions and enhancing neuroplasticity through feedback mechanisms. The potential for BCIs to restore cognitive function, improve mental resilience, and offer non-invasive treatments positions them at the forefront of mental health innovation. As the field advances, ethical considerations surrounding privacy, consent, and accessibility will be crucial to ensuring that these technologies contribute positively to mental healthcare systems worldwide. This abstract explores the intersection of neural engineering, BCIs, and mental health, emphasizing the transformative potential and future directions of this interdisciplinary approach.

KEYWORDS: *Neural Engineering, Brain-Computer Interfaces, Mental Health, Neurological Disorders, Neuroplasticity, Cognitive Function, Real-Time Monitoring, Machine Learning, Non-Invasive Treatments, Mental Resilience, Ethical Considerations*