Chapter 2
Developing Usable Electronic Devices for Brain–Computer Interfaces

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ABSTRACT

This study paper's goal is to assess the viability of producing user-friendly electronics with Brain-Computer Interface (BCI)-based technology. The ultimate goal is to improve the site's accessibility as well as the overall user experience. Brain-computer interfaces, or BCIs for short, are devices that allow direct lines of communication to be established between the brain and outside machinery. By doing away with the need for conventional input methods, this is achieved. The main goal of this research

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is to design and develop electronic devices that use brain-computer interfaces, or BCIs, to facilitate smooth interaction. This is particularly crucial for people who experience mobility issues. The research has brought to light significant issues related to signal accuracy, usability, and real-time responsiveness. The identification of these problems is achieved by analyzing various BCI technologies and integrating them into common devices. These results provide insight into novel approaches to improve device interfaces, intending to improve their usability and ability to adapt.

INTRODUCTION

The introduction of brain-computer interface (BCI) technology has made it possible to construct stoner-friendly technological bias that enables faultless commerce between the human brain and machines. This has opened up new opportunities for the development of devices. Brain-computer interfaces (BCIs) are systems that can interpret brain impulses and turn them into commands. Enables individuals to control electronic bias without experiencing the need for physical commerce (Pandey, B. K. et al., 2024a). With the provision of new results for druggies with disabilities and the enhancement of mortal-computer commerce for the general populace, this cutting-edge technology is leading to the transformation of a variety of areas, including healthcare, communication, and entertainment.

As a result of the increasing reliance on technology in day-to-day living, there has been a considerable increase in the market for electronic bias that is suitable for stoners in recent times. Conventional user interfaces, which include keyboards, touchscreens, and voice commands, frequently experience a dramatic decline in terms of availability and convenience of use for individuals who have difficulties with motor skills (Ahmad, A. Y. B.,2024d or cognitive abilities. Kosmyna, N., Lécuyer, A., Tan, D. S., & Rivière, G. (2016) explains Brain-computer interfaces (BCIs) offer a potential volition because they circumvent traditional control methods and calculate cerebral effort. This makes it possible for druggies to operate bias directly through their studies. Not only does this method improve availability, but it also has the implied potential to improve the efficiency and intuitiveness of device relations for a wide variety of druggies in Figure 1, (YItayew, M. et al., 2020).