

Abstract

A Brain Computer Interface System to Control Wheelchair for Severe Mobility Impaired Persons

Imagine a wheelchair that people with severe physical disabilities can control using only their thoughts. This could transform lives for around 80 million wheelchair users worldwide, including over 16 million in Bangladesh. The goal is to create a wheelchair that understands mental commands—like wanting to move in a specific direction—and turns those thoughts into actions. Our study develops a brain-computer interface (BCI) wheelchair that turns mental commands into actions, addressing issues like noisy brain signals and limited real-world use. Using advanced signal processing, machine learning, and deep learning, we'll analyze brainwaves to create precise commands, improving safety and functionality. The project aligns with SDGs for health, innovation, and equality, prioritizing ethics like privacy and consent. We'll test in labs, using user feedback to refine the design. Future work will tackle challenges like real-world settings, brain pattern variations, and costs, aiming for an intuitive wheelchair that boosts independence and quality of life.