Personalized Wheelchair for Disabled With Mobility Loss

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The researchers became aware of the current social alienation of patients suffering from diseases that cause mobility loss, such as Parkinson's, Lou Gehrig's, Lewy Body, and CTE. Those patients had great difficulty using available electric wheelchairs with physical buttons and operating digital devices freely, creating a lack of rights to move and access to information. Therefore, we tried to solve the above problems through customized wheelchair production. We developed a hand shape recognition program to replace physical buttons, making it easier for users to operate wheelchairs. A web app was mounted on the front of the wheelchair via a transparent display to send text messages, check maps, or use TTS functions. In addition, a transparent monitor was produced and installed to secure the user's full view. Various detailed functions were developed, such as mounting an eye-tracking module at the bottom of the transparent monitor, so patients with reduced mobility can easily use the web app. Three tests were conducted to evaluate the convenience and stability of the above-developed devices, and all obtained favorable results. Therefore, this study is expected to significantly improve information access and mobility rights of people with disabilities suffering from decreased athletic ability, that is, as a steppingstone for them to act as members of society.

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