Alternative Communication Device for People with Amyotrophic Lateral Sclerosis

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Amyotrophic Lateral Sclerosis (ALS) is a neurodegenerative disease that affects the motor neurons responsible for voluntary movement. It is characterized by progressive loss of muscle strength and affects movement, speech and swallowing, causing progressive irreversible paralysis. Usually, the eyeball is the last affected body part. The British astrophysicist Stephen Hawking was a source of inspiration for our project, as he lived with the disease for 55 years. The only muscle he could move was used to communicate through a computer that interpreted and translated his gestures. Current devices for ALS patients have high acquisition costs. As the ability to communicate is essential for people, the aim of this project was to develop a low-cost assistive technology for alternative communication. By using it ALS patients could express themselves through the blink of their eyes, promoting their participation in different social contexts in an autonomous and independent way. To guarantee that the system worked properly, we rigorously analyzed the blinking to define whether it was voluntary or not. We created a language based on blinking that works in a practical and efficient way in order to allow patients to express themselves and to use a computer so they can navigate the internet, listen to music, watch videos, use chats and/or social networks, use search engines, edit texts, among others. In this way, it would improve their quality of life through social inclusion. Despite the emphasis on ALS, this project can be easily adapted for people with similar types of limitations and/or diseases. This work provided us a better understanding about the harsh reality of ALS patients and showed us the importance of more initiatives like this one to reach a more egalitarian society.

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