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CONNECT special

Edition 72

Editor 's Desk

Dear friends,

"We need to make every single thing accessible to every single person with a disability."

— Stevie Wonder

And this would make the world, a beautiful one in true sense!

Happy Reading !

Regards

Bhavna Botta

http://www.connectspecial.in/

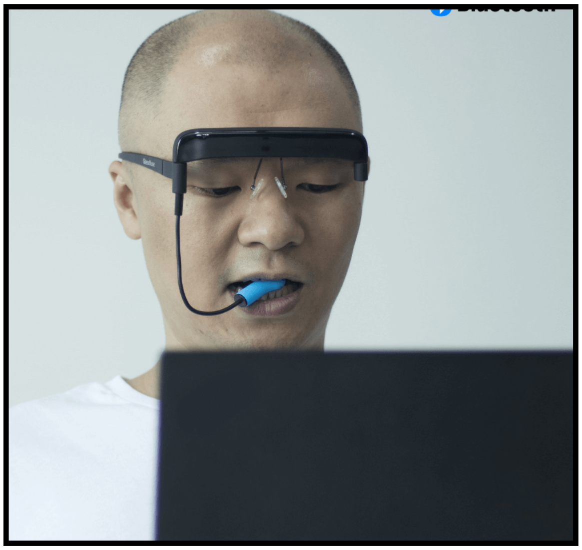
Inclusive ideas

GlassOuse

GlassOuse is a pair of glasses and connects to mobile phones, computers, tablets and Smart TVs via Bluetooth . It gives people with disabilities more control of their computers and other devices for greater independence. For people who struggle with using a standard mouse, this alternative tracks their head movements and converts them to mouse movements on the screens with options of Bite Switch, Puff Switch, and Finger Switch for selection.

Image description - a person see wearing Glassouse and using a bite switch .

http://glassouse.com/



Ginger

Ginger offers several features that can help students with dyslexia and other learning disorders with writing. It has a Grammar checker that analyses context to determine any errors or misspellings. The Word prediction and sentence rephrasing tools can be helpful for students learning how to construct sentences properly. The Text to speech functionality so students can hear what they've written.

Ginger is available for Windows and Macintosh systems, as well as for use on iOS and Android mobile devices.

https://www.gingersoftware.com/

Evernote

Another great app for organizing! With Evernote, we can create to-do lists, capture photos, record voice reminders or simply take notes. And your notes can be searchable.

Available on android and ios

https://evernote.com/download

New spinal implant gets paralyzed people up and walking

Originally featured in

Access and Inclusion through Technology

http://www.accessandinclusion.news/?edition_id=dd6fca50-9276-11ec-aab2-fa163e6ccaff

Picture description -Two formerly paralyzed individuals go for a stroll in Lausanne, Switzerland.

Spinal cord injuries are life-altering, as they prevent the transmission of nerve impulses past the point of injury. But improvements in our understanding of neurobiology have raised the hope that we can eventually restore some control over paralyzed limbs.Some of these efforts focus purely on nerve cells, attempting to get them to grow through the damage at the site of injury and restore a functional spinal cord.

Others attempt to use electronics to bypass the injury entirely. Today,there was very good news for the electronics-focused effort: researchers have designed a spinal implant that can control the leg muscles of paralyzed individuals, allowing those individuals to walk with assistance within hours of the implant being activated.

Skipping the brain

Much of the spinal cord is composed of long extensions made by nerve cells, termed axons. These axons allow nerve impulses to travel long distances, which is necessary for information to travel back and forth to the brain. Sensory inputs, like pain in your elbow or tickling of your feet, ride axons up the spinal cord into the brain. The brain in turn sends signals back down the spinal cord, controlling your breathing or moving your arms.

Injuries to the spinal cord can physically sever these axons, disrupting this communication. Cells have the ability to regrow axons in many cases, but in the spine, heavy scar tissue develops that blocks this process. This means lost communication may never be restored. In some cases, the injury is partial, and the remaining function can be retrained to work with the function that's left.

But in other cases, the damage is severe enough that very little nerve function is retained, and paralysis is permanent.Or at least permanent in the absence of medical intervention. Many researchers are working to find ways to limit or eliminate the scar tissue and induce regrowth of the severed axons. But this new research doesn't involve any of that.

An alternative to that type of biological repair is what you might consider an electronic bypass. In its most sophisticated form, a bypass would involve an implant that registers neural activity,located either in the brain or in the spinal cord closer to the brain than the injury. This is then paired with some sort of hardware—potentially another implant—on the far side of the injury that stimulates the nerves based on the information read by the other implant.

A model spine

To control walking, the axons that bring nerve signals to the leg muscles have to exit the spine; decades of research have identified the specific bundles of nerve fibers in the lower spine where the axons make their exit. Different bundles innervate different muscle groups, allowing the potential for fairly precise control. But so far, that potential has been unrealized.

The team started by looking in detail at these bundles in 27 different individuals, some of them cadavers, the rest CT or MRI scans. The researchers found that there's a fair amount of variability in the details of the spine's structure, although the size of the nerve bundles doesn't change much. But the researchers were able to use this data to build a model of the spine and virtually experiment with electrode location and size in order to see which nerve bundles they would stimulate. This eventually led to the design of an implant with 16 individual electrodes that should allow control over which nerve bundles were activated.

At this point, the three volunteers for this trial, each of whom had lost use of their legs, got involved. The volunteers were placed in an MRI tube to monitor neural activity while their legs were moved. The movement caused their leg muscles to send signals back to the spine regarding their altered tension, setting off activity in the nerve bundle that innervated the muscle. Reading this activity using the MRI allowed the researchers to figure out which nerve bundles were associated with specific muscles.

Using the mix of anatomical and activity data that resulted, the researchers built a computer model for each of the three individuals. The researchers then used this model to control the stimulation of the leg muscles, testing out different potential motions while the subjects were lying down and then fine-tuning the model based on any unwanted movements that resulted. Overall, this process took about an hour.

The results were astonishing. Prior to activating the implant, none of the three participants could initiate any sort of muscle activity when attempting to take a step. The same day that the model was trained, all of the subjects could take steps on a treadmill if they were supported. The model was able to generate the right series of currents to stimulate the leg muscles appropriately.

Out for a walk and more

With three days of fine-tuning, the participants were able to walk around a room if given sufficient support. Eventually, they were able to stand unaided and walk supported only by a walker—their legs were controlled via an implant in their abdomen, which responded to triggers on the handles of the walker. One volunteer was even able to go up stairs.

First Then visual schedule

This application is designed for caregivers to provide positive behavior support to individuals with communication needs, developmental delays, Autism or those who benefit from a structured environment and to increase independence and lower anxiety during transitions through different activities.

The app allows using own photo and record own voice to the images and create as many schedules as needed, flexibility to change the order of a schedule, anytime and also to share.

https://apps.apple.com/us/app/first-then-visual-schedule/id355527801

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