TECHNOLOGY Improving Lives

On The Tip Of The Tongue: Electrical Impulses That Help Blind People "See"

(NAPSA)—A new kind of technology is enabling blind people to "see" their environment—but instead of using their eyes, these individuals are using a different body part: the tongue.

With just a few hours of training, users of a new visual device form a spatial reference, mapping touch information on the tongue to their environment. Participants detect shapes, identify motion, report contrast differences and depth cues. Remarkably, users are able to use this information to guide their behavior in ways that other assistive technologies cannot provide.

About The Device

The prototype BrainPort® vision device1 makes it possible to find a target from a distance and walk directly to it while avoiding obstacles along the way. In addition, users can directly find and pick up target objects (a coffee cup, for instance) instead of touching unintended items. All told, the device offers significant potential for improving safety and quality of life for those who are blind or have low vision.

Visual information is collected from a head-mounted video camera and sent to a control box, which translates the visual information into an electrical pattern for display on the tongue. The brain then interprets the pulses and creates "artificial vision."

Computer Power

A key component of the system is a Sony® VAIO® UX Micro PC. This small form-factor computer has a 4½" screen, weighs just 1.2 pounds and provides video stream capture and image-processing capability, while interfacing with the BrainPort vision's user controller and a remote host for researcher feedback.

Thanks to a device that sends electrical impulses to the tongue, people may soon be able to overcome blindness and vestibular disorders.

"The VAIO UX Micro PC was chosen for its light weight, small size, long battery life and favorable cost," says Rich Hogle, director of product development at Wicab. "Plus, this fully functioning PC integrates well into the BrainPort system. In the end, we found it an excellent choice to get units up and running quickly, while providing a worry-free solution for prototyping."

Why The Tongue?

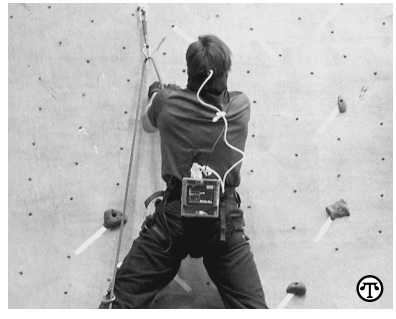
Numerous studies support using the tongue as a sensory substitution channel. Research has revealed that the brain can correctly interpret information from a sensory substitution device, even when the input is not in the same form as in the natural sensory system. And perhaps no BrainPort vision device user has taken the device to such heights as Erik Weihenmayer—the only blind person to have climbed the "Seven Summits," the tallest peak on every continent.

Among his many accomplishments, Weihenmayer has scaled the 3,000-foot rock face of El Capitan, skied down the tallest peak in Europe and guided blind Tibetan teenagers to 21,500 feet on the north side of Mt. Everest. In a 2007 demonstration of the BrainPort vision device, he was able to "see" different playing cards, to recognize the number of fingers his wife Ellie held up in front of him and to reach out and pick up objects from the table.

BrainPort And Balance

The company has developed a similar device for treatment of patients with balance disorders. With the BrainPort balance device[1], the signal on the tongue moves in relation to the patient's head position. During training sessions, patients are instructed to maintain their balance while standing with their eyes closed, solely by maintaining the reference signal in the middle of their tongue. And within hours, most subjects learn to maintain their balance using just the tongue signal.

To learn more about the Sony VAIO UX Micro PC and its role in BrainPort technologies, visit www.sony.com. For additional information about Wicab's vision and balance devices, visit www.sony.com/business.



[1] The BrainPort vision device and BrainPort balance device are investigational devices and their use remains limited by U.S. federal law to investigational uses only. Both devices are currently in clinical trials and are not yet available for sale.