# Brain-computer interface advances improve prosthetics, therapies

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Advances in connecting neural stimulation to physical control of the body are transforming the development of prosthetics and therapeutic training for people with disabilities, according to new research. The findings were presented at Neuroscience 2018, the annual meeting of the Society for Neuroscience and the world's largest source of emerging news about brain science and health.

As improved understanding of neural functions and interactions combines with technical advances, scientists are developing new and improved prosthetics and therapies aimed at improving quality of life for people with conditions such as paralysis, stroke, and blindness. Electrical signals that stimulate specific regions in the brain or body can bypass injuries in the spinal column or eyes and activate target regions, training the brain to process movement or vision in the most effective manner possible.

Today's new findings show that:

- Advances in the precision and force of brain-controlled, computer-guided hand movements may enable people with quadriplegia and others suffering from hand paralysis to begin integrating electrical-stimulation-based prosthetics into their daily lives (Gaurav Sharma, abstract 271.01).
- Using avatars to provide stroke patients with visual feedback in combination with real-time electronic feedback improved the use of motor function even years after a stroke (Christoph Guger,

abstract 271.14).

- A new prosthetic hand system is the first prosthesis designed for regular home use to restore task-related sensations to an amputee (Ranu Jung, abstract 404.10, see attached summary).
- A new brain stimulation technique called "dynamic current steering" helps restore limited vision to blind people (Michael Beauchamp, abstract 226.09).
- An assistive device that combines computer vision and sound cues can help blind people perform everyday tasks such as identifying and locating people and objects around them (Michael Paradiso, abstract 226.04).

"The advances presented today help expand what's possible with brain-machine interfaces," said press conference moderator Chethan Pandarinath, Ph.D., of Emory University, whose work interprets how the brain represents information and intention to build assistive devices for people with disabilities. "The neuroscience advances and range of techniques presented provide potential new assistive devices and treatment strategies for people with disabilities, and also open the door to a deeper understanding of how our brains translate intention into actions."

**More information:** Related Neuroscience 2018 Presentation Minisymposia: Latent Factors and Dynamics in Motor Cortex and Their Application to Brain-Machine Interfaces Saturday, Nov. 3, 1:30-4 p.m., SDCC 28A

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