People missing a hand used their minds to control a prosthetic one, guided by signals from nerves in the arm. EVAN DOUGHERTY/UNIVERSITY OF MICHIGAN ENGINEERING

Minimuscles let amputees control a robot hand with their minds

By **Kelly Servick** | Mar. 4, 2020 , 2:00 PM

Building a beautiful robotic hand is one thing. Getting it to do your bidding is another. For all the hand-shaped prostheses designed to bend each intricate joint on cue, there's still the problem of how to send that cue from the wearer's brain.

Now, by tapping into signals from nerves in the arm, researchers have enabled amputees to precisely control a robotic hand just by thinking about their intended finger movements. The interface, which relies on a set of tiny muscle grafts to amplify a user's nerve signals, just passed its first test in people: It translated those signals into movements, and its accuracy stayed stable over time.

"This is really quite a promising and lovely piece of work," says Gregory Clark, a neural engineer at the University of Utah who was not involved in the research. It "opens up new opportunities for better control."

Most current robotic prostheses work by recording—from the surface of the skin—electrical signals from muscles left intact after an amputation. Some amputees can guide their artificial hand by contracting muscles remaining in the forearm that would have controlled their fingers. If those muscles are missing, people can learn to use less intuitive movements, such as flexing muscles in their upper arm.

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