

Human Trials Next for Darpa's Mind-Controlled Artificial Arm

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Pentagon-backed scientists are getting ready to test thought-controlled prosthetic arms on human subjects, by rewiring their brains to fully integrate the artificial limbs.

Already in recent years, we've seen very lifelike artificial arms, monkeys nibbling bananas with mind-controlled robotic limbs and even humans whose muscle fibers have been wired to prosthetic devices. But this is the first time human brains will be opened up, implanted with a neural interface and then used to operate an artificial limb.

It's a giant step that'll transform the devices, which were little more than hooks and cables only 50 years ago. And the progress is courtesy of Darpa, the Pentagon's far-out R&D agency, who've been sponsoring brain-controlled replacement limbs as part of their Revolutionizing Prosthetics Program.

A team of scientists at Johns Hopkins, behind much of Darpa's prosthetic progress thus far, have received a \$34.5 million contract from the agency to manage the next stages of the project. Researchers will test the Modular Prosthetic Limb (MPL) on a human. The test subject's thoughts will control the arm, which "offers 22 degrees of motion, including independent movement of each finger," provides feedback that essentially restores a sense of touch, and weighs around 9 pounds. That's about the same weight as a human arm.

The prosthetic will rely on micro-arrays, implanted into the brain, that record signals and transmit them to the device. It's a similar

design to that of the freaky monkey mind-control experiments, which have been ongoing at the University of Pittsburgh since at least 2004.

Within two years, Johns Hopkins scientists plan to test the prosthetic in five patients. And those researchers, alongside a Darpa-funded consortium from Caltech, University of Pittsburgh, University of Utah and the University of Chicago, also hope to expand prosthetic abilities to incorporate pressure and touch.

“The goal is to enable the user to more effectively control movements to perform everyday tasks, such as picking up and holding a cup of coffee,” Michael McLoughlin, the project’s program manager, says.

In other words, prosthetic arms that are remarkably similar to the real thing. But the long-term caliber of the MPL arm remains an open question. Just three months ago, Darpa launched a new program to overcome several problems with neuro-prosthetic models — most notably, the two-year lifespan of those implanted neural recording devices.