

Forget computer hacking, your brain may be next

Neural Devices Could Be Targeted, Warn Experts

Hackers who can easily break into personal computers are giving researchers sleepless nights as they fear that someday the human brain might get hacked as well.

In the past year, researchers have developed technology that makes it possible to use thoughts to operate a computer, maneuver a wheelchair or even use Twitter — all without lifting a finger. But as neural devices become more complicated — and go wireless — some scientists say the risks of “brain hacking” should be taken seriously, reports *Wired* News.

“Neural devices are innovating at an extremely rapid rate and hold tremendous promise for the future,” said computer security expert Tadayoshi Kohno of the University of Washington. “But if we don’t start paying attention to security, we’re worried that we might find ourselves in 5 or 10 years saying we’ve made a big mistake.”

Hackers tap into personal computers all the time—but what would hap-



Getty Images

BRAINSTORMING: As neural devices go wireless, hackers might try to manipulate deep-brain stimulators or electrode systems for controlling prosthetic limbs

pen if they focused their nefarious energy on neural devices, such as the deep-brain stimulators currently used to treat Parkinson’s and depression, or electrode systems for controlling prosthetic limbs?

According to Kohno and his colleagues, who published their concerns in *Neurosurgical Focus*, most current devices carry few security risks. But as neural engineering becomes more complex and more widespread, the potential for security breaches will mushroom.

For example, the next generation of implanta-

ble devices to control prosthetic limbs will likely include wireless controls that allow physicians to remotely adjust settings on the machine. If neural engineers don’t build in security features such as encryption and access control, an attacker could hijack the device and take over the robotic limb.

“It’s very hard to design complex systems that don’t have bugs,” Kohno said. “As these medical devices start to become more and more complicated, it gets easier and easier for people to overlook a bug that

could become a very serious risk. It might border on science fiction today, but so did going to the moon 50 years ago.”

Some might question why anyone would want to hack into someone else’s brain, but the experts say there’s a precedent for using PCs to cause neurological harm. In November 2007 and March 2008, malicious programmers vandalized epilepsy support websites by putting up flashing animations, which caused seizures in some photo-sensitive patients.

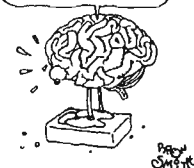
“It happened on two separate occasions,” said computer science graduate student Tamara Denning, a co-author on the paper. “It’s evidence that people will be malicious and try to compromise peoples’ health using computers, especially if neural devices become more widespread.”

In some cases, patients might even want to hack into their own neural device. Hacking into these devices could enable patients to “self-prescribe” pain relief by increasing the activity of the brain’s reward centers. AGENCIES

HEALTH CAPSULE

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THE HUMAN BRAIN WEIGHS THREE POUNDS.