

Microsoft Researchers Developing Muscle-Based PC Interface (w/ Video)

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This scene is taken from the movie, *Minority Report*, that shows Tom Cruise accessing computer information using advanced gesture controls.

(PhysOrg.com) -- Microsoft researchers have teamed up with the University of Washington and the University of Toronto to develop a muscle-controlled interface that allows for hands-free, gesture-driven interaction with computers.

By attaching a band of electrodes to a person's forearm, [electrical activity](#) can be read from different arm muscles. The signals are then compared to different hand [gestures](#) and processed by software.

*Video Caption: Science advisor, Steven Spielberg has created a real-world implementation of the computer systems seen in the *Minority Report*.*

The current model uses six electromyography sensors (EMG) and two ground electrodes placed in a ring around a person's upper right forearm for sensing finger movement. Two additional sensors are placed on the upper left forearm for identifying hand squeezes.

Since the sensors can't accurately interpret [muscle](#) activity, software must be used to train the associate electrical signals with different gestures. By using standard machine-learning algorithms, the software learns to recognize EMG signals produced by a user performing gestures.

The algorithms use three aspects of the EMG signal: the magnitude of muscle activity, the rate of [muscle activity](#), and the wave patterns taking place across several [sensors](#) at once.

After the software is properly trained, using standard machine-learning algorithms, participants gestures were accurately determined 85 percent of the time. In the early stages of training, participants' gestures must be carefully controlled so that the machine-learning algorithms are properly trained.

The goal of this research is to provide a more seamless integration between user and computer. One day advance gesture control, using muscle-base interface, will become the norm and current PC interfaces, such as a mouse, will become obsolete.

More information: Visit [Microsoft Research for muCIs](#)

Via: [Technology Review](#)

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