

Myo Armband



Figure 1: Myo Armband. Image courtesy of Thalmic Labs.

1. What is it?

A touchless input system for controlling applications on both Windows and Apple computers. Applications are also available to control various physical devices via gestures.

2. How does it work?

The Myo is a band that you wear on your arm. It is able to sense your movements and uses custom software to translate them into commands to controls various applications. The system comes with a Bluetooth dongle and the server software can be freely downloaded and installed on any computer.

3. What are the key features?

The Myo recognizes several hand gestures, such as making a fist, waving your hand, or raising your arm into the air. One of its most common uses is for controlling PowerPoint presentations, although it can be used with other applications and has general keyboard and mouse functions. The gestures are simple and easy to learn, but do require a bit of practice.

When using PowerPoint for example, double-tapping your middle finger against your thumb advances to the next slide. Holding your wrist in at a right angle rewinds the presentation, and making a fist and rotating it either gives you an onscreen

pointer that follows your movements or allows you to zoom in on an image. This is the most reliable mode for the Myo and works quite well.

Other functions, such as acting as a mouse, are less successful. It's difficult to control the pointer and positioning and clicking on a small icon is very difficult.

The vendor does operate a marketplace that currently contains over 100 applications that have been enhanced with Myo compatibility. Those include games, control packages for both flying and ground-based devices (such as quadcopters and Sphero toys), programming tools, and connectors to popular applications like YouTube and iTunes. This may, in fact, be Myo's strongest point. As a generic computer control device it generally falls short of what can be done with other technologies such as voice control or wireless remotes.

However, for specialized and non-traditional applications, it may prove to be just the thing.



Figure 2: The Myo sits on the forearm and interprets muscle movement. Image courtesy of Thalmic Labs.

4. What are the potential uses on the ISU campus?

- Large lecture presentations
- HCI teaching and learning
- Touchless device control.

5. What are the implications for teaching and learning?

Human-computer Interaction (HCI) is an exciting and rapidly-evolving field. As our devices get smaller and more complex, there is a need for control mechanisms that don't rely on typing or physically moving controls. Voice recognition is one possible (partial) solution, and the Myo may represent another avenue for exploration. For

example, there may be certain scenarios in the fields of medicine and biology where having to touch a physical controller is not possible, but where a hand or arm movement is preferred. In addition, the vendor offers “Myo Education Kits” with up to 24 armbands, associated hardware, and lesson plans designed to allow students to learn about gesture control, programming, and signal processing.



Figure 3: The Myo can be used with many apps and devices, including some virtual reality headsets. Image courtesy of Thalmic Labs.

6. What are the downsides?

The Myo is very much first-generation technology: It's rather bulky and uncomfortable, is difficult to sync (which is required every time you put it on), and can be rather finicky and hard to control.

For general classroom use, the biggest drawback to the Myo seems to be that there is little practical application for it. How many times do you find yourself within Bluetooth range of your computer and needing to control it, but can't hold or touch anything? A good presentation remote with a built-in laser pointer would do a better job of controlling a PowerPoint presentation, and Myo is really a bit too unreliable to use as a generic input device.

7. What are the key technical specs?

- Medical grade stainless steel EMG sensors

- Nine-axis IMU containing three-axis gyroscope
- Three-axis accelerometer
- Three-axis magnetometer
- Dual Indicator LEDs
- ARM Cortex M4 Processor
- Haptic Feedback
- Bluetooth Connectivity
- Rechargeable lithium ion battery, providing a full-day's use

8. Where can I find out more?

Visit the Myo website at <https://www.myo.com/>.

The Myo Market at <https://market.myo.com/> lists the different products and apps that are compatible with the Myo armband.

You may also contact Jacob E. Larsen (jlarsen@iastate.edu) or Mike Wilson (mawilson@iastate.edu) in IT Services to discuss how the Myo can be used in your classroom or lab.

Additional [legal information](#).

Guest contributor Mike Wilson is a communications manager with ISU IT Services where he, among other things, supports ISU's Zoom video conferencing and Panopto classroom capture solutions. Mike is also very involved in the use of cell phones and connected accessories for the purposes of remote control and task automation.