

Critique: Leap Motion

To me, it seems like the Leap Motion has been under the radar for a long time, and never really reached the mainstream, even though Elon Musk [praised it](#) (in 2013!). I'm not entirely sure why, because at first glance the technology looks powerful when it comes to interacting with a computer. In fact, "Leap Motion is transforming how we interact with technology using the original interface: the human hand." In the video linked above, SpaceX describes using technologies like the Leap Motion to explore "methods for engineers to accelerate their workflow by designing more directly in 3D. We are integrating breakthroughs in sensor and visualization technologies to view and modify designs more naturally and efficiently than we could using purely 2D tools. We are just beginning, but eventually hope to build the fastest route between the idea of a rocket and the reality of the factory floor." I definitely agree with the message these

statements describe, and believe this technology could easily be built into keyboards, laptops, and even VR headsets, or used as a standalone device with a computer!



The Leap Motion was first introduced to the public in 2012, to be used with the usual desktop or laptop setup, only costing about \$70 USD. It connects through USB 2.0, requires a minimum of 2.0 GB of RAM, and can be used with an i3/i5/i7 processor. In other words, this cute tiny device is compatible with many consumer products, which is a big deal. The Leap Motion uses two monochromatic IR cameras and three infrared LEDs to observe a roughly hemispherical area within 1 meter. The observed data is sent to the computer, where software extracts 3D position data by comparing the 2D frames generated by the two cameras. If you want to know more details about Leap Motion, Timothy Choh's [Student Choice report](#) is a good place to start. Additional resources will be listed at the bottom.

Just watch this beautiful [video](#), showcasing some of the things you can do with Leap Motion. Interaction looks so smooth and intuitive. Did you notice the precision, especially towards the end when the user uses both hands to draw in 3D? In a 2013 study, the overall average

accuracy of the controller was shown to be 0.7 millimeters. Depending on the environment, accuracy can reach as high as .01 millimeters.



With all this in mind, however, the Leap Motion didn't do so well when it was introduced to the market, and in 2014 layoffs (10% of their workforce) had to be made, primarily in sales and marketing. Why was this amazing technology not being adopted by the mass?! I don't have a clear answer, but I assume the main contribution can be tied to people believing the Leap Motion was more of a novelty than a tool, best served as a means for entertainment, not productivity. I think people just weren't ready and creative enough in thinking of the future and potential applications for this technology. That is starting to quickly change, and I'm excited! In 2016, the company released new software titled Orion, specifically designed for hand and finger tracking in VR and AR! Here is a jaw dropping [video](#) showing the Leap Motion in VR. Were you able to grasp how wonderful that truly was?! It is so easy to interact with the virtual world. You are literally using your bare hands to control the virtual world around you. A lot of people share my excitement, well at least I hope. Most high-end headsets have their own handheld

controllers. Leap Motion hand-tracking technology can integrate with all VR systems, potentially becoming the standard VR controller in the near future and promising greater immersion.



Leap Motion consists of a combination of hardware and software solutions. It can be used with a Desktop or VR environment, on a plethora of devices. This makes the highly portable and accessible Leap Motion a very effective tool. There are of course a lot more ways to use Leap Motion, for example in museum installations or controlling robotics. The possibilities are vast. Leap Motion is already driving new experiences, spanning automotive, education, engineering, healthcare, retail, smart devices, entertainment, and creative. Here are a bunch of [examples](#) for VR/AR!

Additional Resources

- 1) <https://www.leapmotion.com/>
- 2) <https://edgyllabs.com/leap-motion-hand-vr/>