What is Leap Motion?

- Leap Motion technology makes it possible to interact with technology using your bare hands.

- The company was founded in 2010 by David Holz and Michael Buckwald, and began shipping the Leap Motion Controller in July 2013.

- Leap Motion HQ is in San Francisco, CA.

What Can You Do with It?

The Leap Motion Controller works alongside your mouse and keyboard, translating hand and finger movements into a rich array of 3D input. Developers are using the device to create everything from games, art, and music to motion-controlled robots and AR/VR experiences.

Hardware Breakdown

- Near-Infrared LEDs
  - Illuminate hands in day or night

- Wide Angle Lenses
  - Provide large interaction space

- Global Shutter Image Sensors
  - 120+ frames per second

- USB Controller
  - Crops and compresses video streams
  - USB 2.0

Languages Available

Native Development

- Windows, Mac & Linux

- C++, C# (Unity3D), Objective-C, Java & Python

- Extensible to other languages (e.g., Flash/AIR, MatLab, Ruby)

- Polling or event callbacks

- SDK, libraries, documentation, tutorials & examples available from developer.leapmotion.com

- Unity assets and examples from developer. leapmotion.com/downloads/unity

Web Development

- Support for modern browsers through WebSocket connection

- JavaScript & CoffeeScript

- Plugin system to share common code & reduce boilerplate

- Polling or event callbacks

- LeapJS library, documentation, tutorials & examples available from Leap.JS

- Libraries hosted on our CDN

Hand Tracking API

The Leap Motion system recognizes and tracks hands, fingers and finger-like tools. The device operates within 60 cm of the user with high precision and tracking frame rate – reporting discrete positions, motions, and gestures.

- Hands
    - Handedness (left or right)
    - Bones and joints from elbow through fingertips
    - Position, length, radius & orientation of each bone
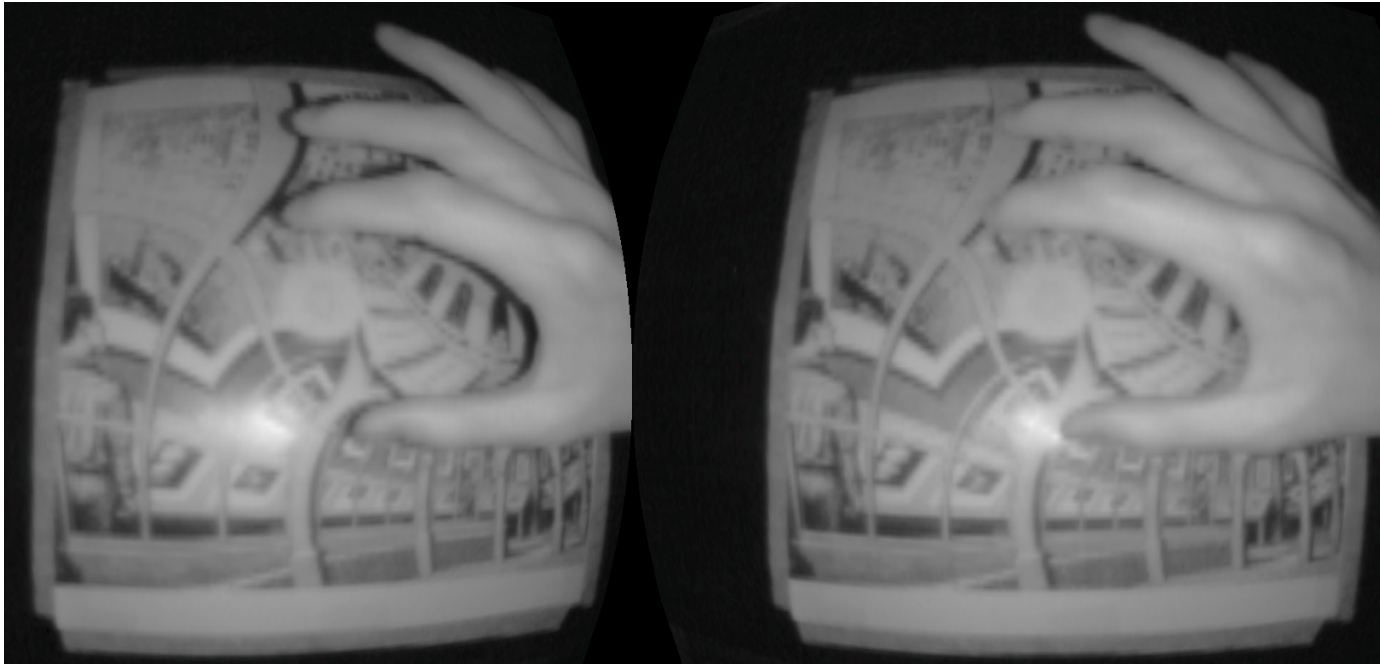   - Tracking confidence

Pinch

- Gestures
    - Circle and swipe
    - Recent translation & rotation of hand
    - Grab strength for hand
    - Pinch strength for hand
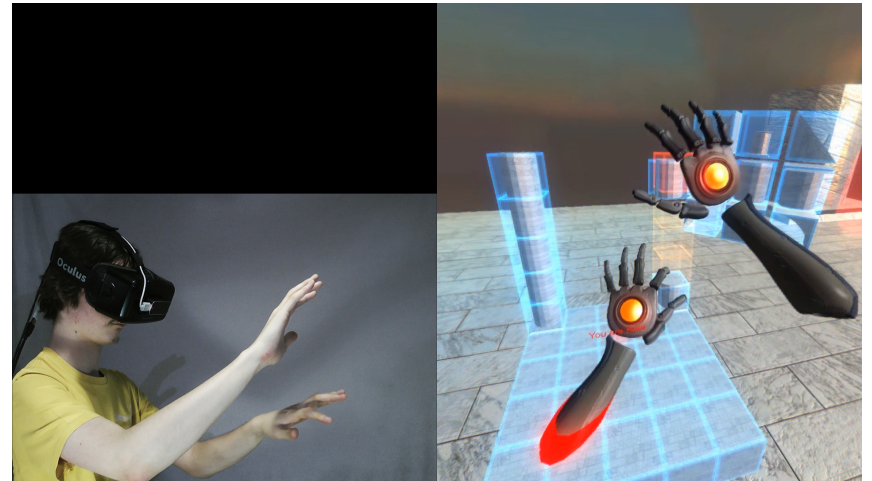
Grab

Image API

- What you see is what the Leap sees!
  - Near-infrared view of the world
  - Stereoscopic images
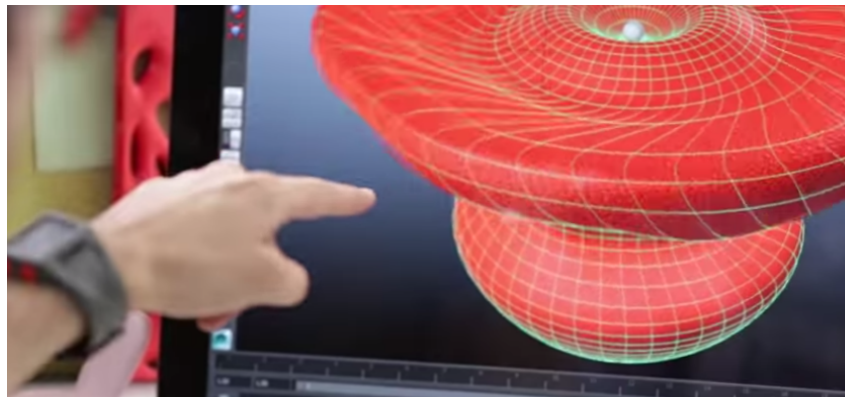 - Minimal distortion & low latency

Leap in the Wild

Healthcare

Games

Design

Development Tips

- **Device location & orientation**
  - Consider hand ergonomics
  - Clear the Leap controller's view
  - Understand what is visible to the Leap controller

- **Motion control vs. gestures**
  - Immediate vs. delayed result
  - Direct object manipulation vs. abstract state control

- **User experience**
  - Orient user with tutorials
  - Provide visual feedback

- Menu interaction
  - Throw away 2D assumptions (clicks)
  - Use boundary-crossing or hover
  - Integrate menus with content

- Development process
  - Observe interaction styles in other motion-controlled applications
  - Focus on core interactions
  - Make rapid prototypes
  - Test with users and iterate

Helpful Links

Design Tips:

- [4 Tips for building your first motion controlled experience](#)
- [VR Design Guidelines](#)
- [Widgets for Unity](#)
- [Quick Switch for Unity](#)
- [JavaScript VR Quickstart](#)
- [Building VR Applications from Scratch](#)
- [VR Troubleshooting Guide](#)

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Thank You

Feel free to contact us!

Questions? Email us!
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