**NPointer**: http://www.neurotechnology.com/download.html#npointer

Relevant Features:

* Allows user to control mouse based on the position of the center of the hand, using only the webcam built in to the computer with no additional hardware necessary.
* Holding hand still is used to select actions
* Context menu brought up when hand held still
* Can also use head to control mouse
* Lets user adjust mouse speed, mouse acceleration, etc.
* Detects hand very well in brightly lit areas

Issues:

* Difficult to both precisely move mouse around and go from one side of the screen to the other in a short period of time
* Context menu pops up when simply standing still
* Too many “gestures” are necessary to click, making this form of input unlikely to replace the standard mouse.

Planned Implementation Ideas:

* Replicate the hand detection ability in good lighting conditions
* Allow a gesture to toggle gesture tracking
* Have simple gestures execute macros instead of single clicks
* Use only the webcam to detect gestures

**AllSee**: <http://www.washington.edu/news/2014/02/27/battery-free-technology-brings-gesture-recognition-to-all-devices/>

Relevant Features:

* Detects many actions and allows binding to custom actions
* Lightweight and efficient
* Seems to interface with both Android and PC

Issues:

* Requires additional hardware
* Only allows actions which move perpendicular to the device (i.e. punch, push, pull)

Planned Implementation Ideas:

* Allow custom binding to many different actions
* Have the system be efficient to allow it to work on low power devices
* Use only the webcam instead of additional hardware
* Make API easy to access, modify, and reuse

**LeapMotion:** <https://www.leapmotion.com/>

Relevant Features:

* Uses a combination of hardware in order to generate a 3d model of the hands
* Provides a platform for others to build off of, resulting in gesture controlled computer, games, art programs, etc.
* Easy way for developers to hook off of the platform, nice SDK to provide data
* The API is well documented
* Seems to work well in all lighting conditions, due to IR and depth sensors.

Issues:

* Additional hardware is required. At $79.99, it may be cost prohibitive
* Works only when situated under your hands

Planned Implementation Ideas:

* Provide a very easy to use API to allow others to create gesture enabled applications
* Give developer access to data about points on the hand instead of just gestures, if desired
* Be able to track multiple points on the hand instead of just the palm
* Generate some idea of depth based on the change in distances between multiple points
* Allow gestures in a plane perpendicular to the camera, or ones directly perpendicular to camera

**OpenCV Static Gesture Detection:** <https://www.youtube.com/watch?v=xML2S6bvMwI>

Relevant Features:

* Detects hand, obtains convex hull, finds center of palm and points for fingers
* Can detect which static gesture the hand is making
* Does a background subtraction to only show relevant parts of the image
* Only uses OpenCV and webcam
* Can detect both hands at arbitrary rotations
* Provided a brief overview of the algorithm

Issues:

* Doesn't do any sort of gesture recognition across multiple frames

Planned Implementation Ideas:

* Track multiple points on the hand over multiple frames
* Differentiate between different hand positions
* Background subtraction to make contour detection easier