**Project Definition Document Outline**

**Team members:** Matt Raporte, Greg Potter

**Client:** Professor Xiaolei Huang

**Brief description of the project:**

Our project will make use of a laptop/PC mounted Leap Motion sensor to map several hand gestures into useful functions such as window management, volume/brightness control etc. to demonstrate a cost effective, practical and widely applicable use of this technology.

**What is the problem:**

AR/VR technology is rapidly growing, but it’s a long way from being a common household item. Development of this technology seems to be largely focused on “end-goal” products that provide a completely new, fully immersive user experience such as the HoloLens, Google Glass or Oculus Rift. The problem with this is:

1) Technology isn’t sophisticated enough to live up to the expectations of the public

2) Hardware costs are too high to justify

As a result this technology is stuck in a developmental phase and is largely inaccessible to the general public. And even if you do get your hands on some of this technology, most of the software written for it are “cool” or sometimes even “novel”, for the most part it isn’t really that practical for the average consumer or help with productivity.

**Why is it interesting/important:**

If we can create a cheap, effective and useful way to incorporate this technology with an existing product (such as a laptop computer or a PC) it could be one of the first “household” applications of an emerging technology. At less than $100, the cost of a Leap Motion controller is incredibly attainable for many. Additionally, over the last five years or so, we have seen touch become a primary input source for not only mobile devices but computers as well. Success of devices such as the iPad and the Surface Pro have shown that users want to interact with technologies that feel more natural. Motions such as taps and swipes are beginning to replace clicks. We are proposing something that takes these natural motions and put them into a 3d environment. The potential for a Leap Motion like device to be integrated *inside* of a computer, makes this even more exciting.

**What is the proposed solution to the problem:**

We are proposing a software solution to integrate a Leap Motion controller into everyday computer interactions. Someone browsing a website could, of course, scroll down using a keyboard and/or mouse, but we also want to give them the option to use a gesture. This will allow for users have a new option to interact with their computers in a new way using this new technology, while also improving productivity. This could also be helpful for people who are presenting as advancing slides often relies on a clicker, running back to the computer, or something else. With our proposed project, they would just perform a gesture and the slide would automatically advance without the presenter having to move away from the stage.

**Clear enumeration of customer requirements:**

**Minimum scope you must accomplish to meet customer requirements (and pass the course):**

Using the Leap Motion Controller and the Windows API, allow users to move windows, perform basic scrolling functionality, and advance slides in PowerPoint.

**Remaining (desired) project deliverables prioritized if possible:**

* Integrate with Windows logon to allow for “3D gesture passwords”
* Allow users to adjust volume, brightness, and other features
* Create a cursor so that the user can click on items on the screen controlled by motion
* Create a virtual keyboard (or handwriting recognition) to allow for text input when necessary
* Allow two users to use the computer together