**Leap Motion - Power Point**

Verification Document

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Customer: Professor Huang, Professor Chuah

1. Scope of the Software

The software is expected to have the following components:

* A *Detection* component to listen for user hand gestures and identify them
* A *Translation* component communicates the detected gesture to the action component
* A *Action* component takes the gesture name and performs the correct action to the power

2. Typical Use Case

The user runs our program(s) and launches a PowerPoint presentation. The user issues physical hand gestures over the Leap Motion sensor, which are detected and identified in live time by our *Detection* component. Each detected gesture is communicated to a queue (after a little bit of logic) and then passed on to the PowerPoint application.

3. Test Plans

1. *Detection* Test: (White-box)
2. Each Gesture will be tested for accuracy by having random users issue gestures, and having the *Detection* component print gesture names to console; each Gesture will be simultaneously tested for speed using a built in clock to time latency between recognition (object detected in frame) and gesture recognition (outprint). Running these tests concurrently will allow us to evaluate speeds of false-detection, mis-detection and correct-detection separately. *Detection* accuracy will also be judged and improved by testing and assessing edge cases, and the *Detection* process speed will be further evaluated using Big O notation.
3. The test will be passed once accuracy for every gesture is >90% and latency is <1.5s, or we have proved hardware or software limitations.
4. *Translation* Test: (White-box)
5. Each gesture/command will be dropped on a queue with a timestamp so that events that the *Action* phase might miss aren’t all of a sudden batched up with
6. We might add something to make sure that there is a “cooldown” period between commands which we can test by manually firing many events and seeing how many (and which ones) actually get through the queue.
7. *Action* Test: (White-box)
8. Full-Scope Test: (Black-box)
9. Full-Scope of our project will be tested after each component passes its white-box testing. Full-Scope will be tested for accuracy by having testers issue random gestures with Power Point running, and corresponding PowerPoint behaviors (or lack of behaviors) will be recorded and quantified per Gesture-Execution pairs. Full-Scope will also be tested for speed by simultaneously recording intervals between object recognition in frame to *Action* execution while accuracy testing is conducted.
10. This test will be passed when every gesture results in its corresponding Power Point *Action* being executed at <2s from the Leap Motion controller capturing a “hand” frame. With at least an 85% accuracy.
11. Full-Scope Live Functionality Test: (Black-box)
12. After Full-Scope testing is passed we will conduct a live test of our full project by using it to control an informative slideshow we will present alongside our Poster Presentation. In order to conduct this test before the final presentations on 12/04, we will have to pass our Full-Scope testing phase before the practice presentation dates of 11/24 and 12/01.
13. This test will be passed when we are able to complete the whole presentation without any non-Leap input device assistance, use each gesture at least once, and receive a positive response from the class and Professor Chuah.