CS 5245 – Vision and Graphics for Special Effect
Project progress

Group member:

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Project title: Ideal Laptop
Getting 3D objects from a 2D-flat, transparent laptop screen

What should have been done

Our original schedule was to have a working video that we could use later for the animation of the hand with the monitor. We plan to have two video shots: one without the hand and one with a real and virtual hand edited using Maya.

Week 5: Finalize the script.
Week 6: Shoot video and create the transparent screen.
Week 7: Starting to do touching and pulling screen effect. In the mean time, we'll create the 3D model for the hand so that later we can create interaction effect between the hand and things on the monitor.

What we have done

In fact, we have not been able to get clear video due to some technical fault on our side by using USB cable instead of fire wire port. We did some testing using Adobe after effects of creating the transparent laptop. We have also mange to find 3D models of the hand and laptop. Further work will be to use our concept on a clearer video and also generating our 2nd video using Maya.

There are two simple way of creating a transparent laptop with camera movement. One would be to shoot two videos, with the laptop shot in blue screen so as to act as the foreground. But one problem that we face was having a robot to control both camera motion and speed. The second way of doing it would be have the laptop model as a CG object. But this way also fails to work perfectly as the laptop would not look like a real laptop. So an alternative solution has to be found. After some discussion, we devised a way of having just one video shot to capture all frames that we need without worrying about the camera motion and speed. The below section will shows the procedure of the shots.

Since we do not have robot to control the motion of the camera where we can shoot the video twice with the same camera movement, we had to think of an ingenious way to do blue-screen matting to produce a transparent screen effect. We intend to replace the laptop screen by a CG screen while retaining the original laptop without screen.

The sequences of frames are shown below.

Next we model the hand and laptop. We tried using the 3d scanner in the media lab, but as the quality of the scan wasn't really good, we abandon the idea of using the scanner. The next approach was to find free 3d model of the hand and laptop and modify it to our needs. This approach left us with little time to do other things, as most 3d models found on the web requires us to pay for it. But nevertheless, we eventually found a model for the hand and laptop. To proof that we could use this two models that we found, we did some small skeleton to mimic the movement of the hand and laptop. It proof that we could use these models.

Initial position of laptop.

Intermediate frame, camera has rotated. We want to remove the laptop screen by covering it with a blue cloth while retaining the objects in the background so that we can incorporate the CG screen
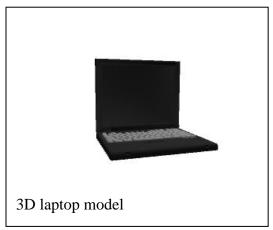

Final position of laptop. After the initial shot of camera rotation is done, we next have to create the virtual shop whereby the user can buy a can of drink and take out from the screen.

Initial laptop with transparent screen. Next we add a online shop, the user will then click on the screen using his finger. A can of coke will pop out from the screen. The user will then reach in to grab the can of coke out from the screen.

The 3d object that we obtain

3D laptop model

Tasks to be done:

According to our pervious schedule, we hope to finish all effects by week 9. So for our next steps, we need to animate the 3D hand, matching the 2D image created by animation with the real video seamlessly, and doing match move.

Morphing 3d object to 2d objects and vice-verse

To get a thing out of screen, we're thinking of using morphing to create a smooth effect. There are two solutions that we're examining:

At first, we model the thing that we want to get out. Because in the screen, the object is 2D-view but when it is taken out slowly from the screen, it becomes 3D object. So we need to do morphing from 2D to 3D.

Second approach, we shoot a video of taking a thing with blue cloths and of course, this video will produce 2D-view. From that we only need to morph from 2D-viewed object in the screen to the object in the video of taking it out.

We're considering of using one of them to solve our problem. For the first approach, it's difficult to model and texture an object that looks real like a coke can or a cup of noodle with detail interface. We tried to scan an object to get the geometry and did the texture

mapping. However, the scanner in media lab can't get the whole geometry of the object. It only can construct one side of the object once a time. We also tried to search for a 3D-model of a coke in the internet. What ever it's a free model, it doesn't look real.

So we turn to the second approach. With this one, we have to match the 2 videos well in term of position. One shot has a coke in the screen. The other is the taking out of coke with blue cloths. And we only need to do morphing from 2D to 2D at the boundary between the screen and the space in front of the screen.

One thing that we must do is model the hand and also morphing the hand from real and modeled one. Because when the hand goes and reaches the screen, it starts becoming 2D and can't be viewed at the back of the screen. Everything should be "on the screen" and can't be seen at the back of the screen. At the moment, we already get the model of the hand. To make the model looks real, we think morphing from the model to the real hand is necessary.

Finally, to put all the model objects in the video, we need to do the match move.