HandMade

The final project for @pybae, @MikkelKim, @tsherlock, and @iancai.
Our team name is HandMade!

Our members:

- Paul Bae
- Mikkel Kim
- Tim Sherlock
- Ian Cai

Pitch

There is a growing market in drawing tools, such as Paper and Sketchpad. These tools don't seek to replace the power of heavy applications, such as PhotoShop, but instead seek to provide a simple interface to allow users to quickly sketch up their ideas.

There have been several burgeoning ideas in this region as well. Rocketboard, which allows users to draw on a whiteboard to share thoughts in real time, FlockDraw, and much more.

Our app seeks to do the same, but in a unique way.

Rather than relying on mice or touch surfaces for input, our app will take input from the user by a camera. By using real-time hand tracking, we can track the motions of the hand to simulate drawing on a virtual whiteboard.

We can come up with a set of gestures to represent each action:

- An index finger pointed to the camera will represent the drawing state.
- A palm moving will cause the current white board view to move.
- A closing fist represents zooming out
- A opening fist represents zooming in

And these gestures are hypothetical as of the moment, and will likely changed based on user input.

Our end goal is to create a desktop application that relies on the laptop's camera as input and provides a virtual whiteboard that users can write on, zoom in, zoom out, move around, and share (if time permits) to other users.

Objectives

Objective: Detect hand motion using a laptop camera

- Result: Robust hand motion tracking in OpenCV and C++
- Result: The gestures describe above being accurately recognized

Objective: Create an virtual whiteboard plane in OpenGL

- Result: A drawable (pretty) whiteboard rendered in OpenGL
- Result: A whiteboard with the previously described hand motion as input
- Result: A whiteboard with basic functionality (such as erasing and the like) being supported

Objective: A desktop application integrating the above two approaches

- Result: A desktop application for OS X and Linux integrating the two above objectives
- Result: The desktop application properly supporting the above whiteboard and the hand motion

Schedule

Our implementation will likely be in C++, OpenCV, and OpenGL. Our goal for the final project is to have a working demo of the whiteboard, with the above gestures implemented, and if time permits, present the white board in real time online.

13 Nov:

- Have basic hand detection set up
- Make pointing the finger be recognized
- Have the whiteboard (the canvas) set up in OpenGL

20 Nov:

- Make hand detection more robust (implementing more gestures)
- Take surveys regarding what gestures to use
- Link up the whiteboard in OpenGL to a Desktop application (framework is undecided as of now)

2 Dec:

- Finish hand tracking (and make it much more robust.
- Integrate the OpenCV code to the Desktop Application.
- Finish the UI of the Desktop Application.
- Have a real time demo of the whiteboard (using HTML5 and Canvas) if time permits