DIY Interactive Whiteboard

Required Hardware list:

- Bluetooth adapter
- DIY Infrared pen
- Wii remote controller
- Microphone holder
- Microphone stand
- Projector
- PC Computer
Set up steps

1. Setup your projector properly and connect your projector to your PC computer; recommend you fix your projector’s position, in that case you don’t have to do the calibration next time;

2. Setup your Wiimote controller and make the infrared camera size (black rectangle) points to the projective area;
Recommend the distance and position as the following:

45 degree to the projective area
3. Plug your Bluetooth adapter into your PC. Most of the Bluetooth adapters don’t require a driver.

**Software**

**How to use**

1. You MUST first connect your wiimote to your PC via bluetooth before running the program.

2. Launch "WiimoteWhiteboard.exe" in the root directly of the archive. NOTE: ANY visible IR source will trigger mouse events and manipulate your computer. Any unintentional IR sources may result in undesired behavior. BE CAREFUL where you point the wiimote.

3. Click the button "Calibrate Location" or press the A button on the wiimote to begin touch calibration. Use your IR light pen to touch each crosshair and activate the LED (as if pressing your mouse button to click). After 4 points are calibrated, the touch screen should be ready to use.

**Recalibration (and auto-loading last calibration)**

To recalibrate, simply press the calibration button again (note the light pen stylus may not work yet if the calibration was poor) or press your wiimote A button. When the program is launched, it will reload the last calibration. If your wiimote and display configuration has not changed, re-calibration may not be necessary.

**Controls**

1. Pressing the A button on the wiimote will activate the calibration once the whiteboard application is running. If the calibration is already running, this will restart the calibration with the 1st point.

2. Pressing the esc will exit the calibration screen.

3. "Cursor Control" will enable or disable mouse control of the stylus.
Wiimote Whiteboard IR Pen

How to build an IR pen for use with a wiimote whiteboard-style project

For this project you will need:
- 1 IR LED -. Make sure its forward bias is \leq 1.5 \text{ V}, or you won’t be able to drive it with a normal AA battery.
- 1 momentary switch, the smaller the better
- 1 marker/highlighter
- 1 AA or AAA battery
- And some wire, both regular battery-pack-connector style wire and optionally some thicker gauge wire for making the springs on the end of the battery compartment.

We need to do two things: remove the internal guts of the highlighter and create a hole for the momentary switch. The easiest way to remove the internals of the pen is to use a pair of pliers to pull the bottom end cap off of the pen. The internal highlighter part can then be removed.
To make a hole for the switch I used a cheap soldering iron to melt acrylic into the side of the pen slightly smaller than the switch. Then before the plastic had cooled, I pushed the switch into the hole ensuring the switch fit snugly and eliminating the need to glue or otherwise attach the switch later.

This part is useful to make sure you get the polarity the right way round on the battery. If it's backwards, the LED won't light at all. The idea is to have one end of the battery attach to the switch, and the other end to a wire that will run the length of the pen (on the inside) and attach to the bottom stopper.

To make sure the battery has a good contact, we're going to build some springs out of the heavier gauge wire, similar to the ones found on 'real' battery holders. The easiest way to do this is to use a pair of pliers to wrap the stripped heavy gauge wire into a series of coils, then pull the ends so that the coil expands into a spring.
Now comes the tricky bit:
Solder the LED onto the wire going to the battery, and slide it into the pen so that the battery lead is coming out of the bottom and the wire going to the switch is sticking out of the switch hole you made in the pen. Attach this lead and the spring to your switch, soldering all of the connections to ensure a good contact. Then squeeze the spring into the pen and wriggle the switch into its hole. This part is fiddly – you don’t want to kink the wires or damage the switch, and because the LED and spring are both stiff wires it’s easy to get stuff stuck. The trick is not to panic and not to force it - you have plenty of time to get it right. I found that reaching a thin screwdriver up from the bottom of the pen let me move wires around until I got the switch placed right. A small hook to pull the spring down the pen would be good too.

Once the switch is in place it’s time to deal with the other end of the pen. Make another spring from the heavy gauge wire, and solder it on to the wire coming from the LED. At this point you can glue or otherwise attach the spring to the end cap of the pen, drop a battery in, insert the end cap and test your creation. If you were able to use one thin wire from the LED to the end of the pen an AA battery should fit perfectly into this slot. If had to combine to smaller wires to get the desired length it’s possible the joint between the wires will stop an AA from fitting into the pen. If this is the case, you can use a AAA battery, just make sure you attach the battery to the side of the pen with a little bit of blue tack to stop it rattling out of place.