

# Webcam Whiteboard Finger Tracking Guide

## Table of contents

Webcam Whiteboard Finger Tracking Guide.....	1
1 Preface.....	2
2 Hardware.....	2
3 Software.....	2
4 Webcam Preferences.....	3
5 Webcam Whiteboard Preferences.....	3
6 How to control the cursor.....	5



## 1 Preface

Finger Tracking in Webcam Whiteboard (WW) is a Cursor-Mode. The actual tracking is accomplished with the help of infra-red light, because this is the basis of WW. So actually not the fingers are tracked, but something distinguishable at the fingers.

The Cursor-Mode enables the user to move the mouse-cursor over the screen with particular movements and actions. So the Modes in WW just interpret with which the Tracking-Engine feeds them.

## 2 Hardware

As mentioned before, the basis of finger tracking in WW is tracking infra-red light. Because of this you need some material to make your fingers reflect or emit infra-red light.



The simplest way is to take reflective stripes and put them at three of your fingers (preferable index finger, thumb and middle finger).

If you choose this way you need additionally some infra-red light source, which is strong enough. The easiest way is to buy a webcam with night vision abilities. They have

some infra-red LEDs around the lens, which should be enough. Infra-red pass filters are not necessarily needed if the room is dark enough.



## 3 Software

For Finger Tracking in WW you need at least Webcam Whiteboard version 1.4. WW is written in Java, so you need Java too to run it. At least version 1.6. Currently WW is just running on Windows XP and higher.

In order to run your webcam, you need the right drivers installed. No additional webcam applications are needed. Everything can be set up in WW.

You won't need to install WW. It runs out of the box.



## 4 Webcam Preferences

The webcam needs to „see“ just your fingers. Normally WW can handle the preferences automatically, but if this did not work or the preferences are not appropriate, you have to change them on your own. You have the right preferences when you just see a black image and nothing else, except you point reflective material at the webcam. This should reflect the infra-red light (Colour: white).

You can change the webcam' preferences in WW: “Extras” → “Settings” → “Video Capture Filters”.

WW handles following preferences automatically: Colour , brightness, gamma, exposure and contrast:

- Disable colours (grayscale is enough)
- Decrease brightness (min value)
- Increase contrast (max value)
- Decrease gamma (min value)
- Decrease exposure (min value)

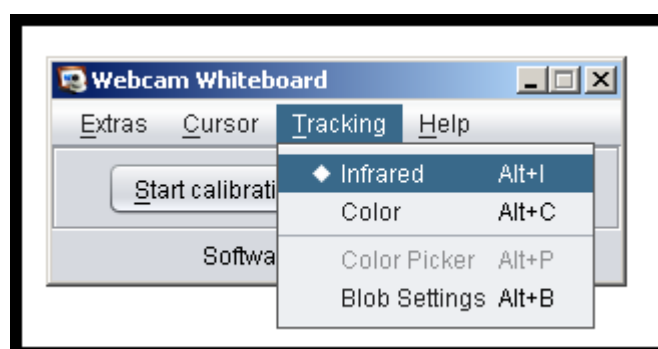
If you are using a night vision webcam, don't forget to activate the infra-red LEDs (cover the sensor)!

## 5 Webcam Whiteboard Preferences

WW is not originally made for Finger Tracking, so it includes some other Cursor Modes. You have to set everything up to track your fingers.

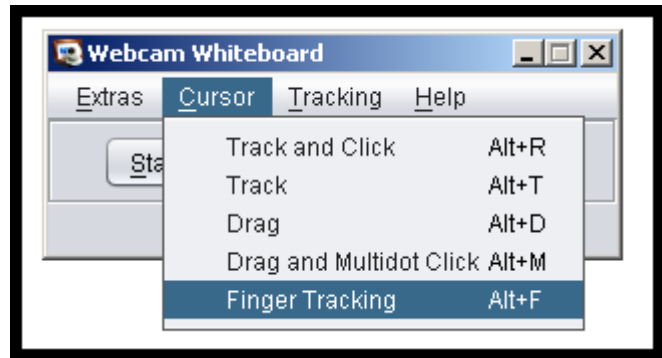
You can start WW by opening the file „Webcam-Whiteboard-x.x.exe“. After that WW should show you the Device Chooser. Here you can choose the right webcam, if you have more than one. After that WW connects to your webcam.

If it was successful you should see the main window. First you have to be sure if WW tracks infra-red light an no colours. Therefore select „Tracking“ → „Infrared“.

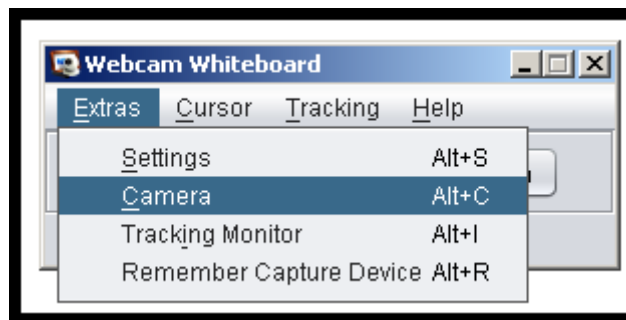




After that select „Finger Tracking“ under the drop down menu „Cursor“.

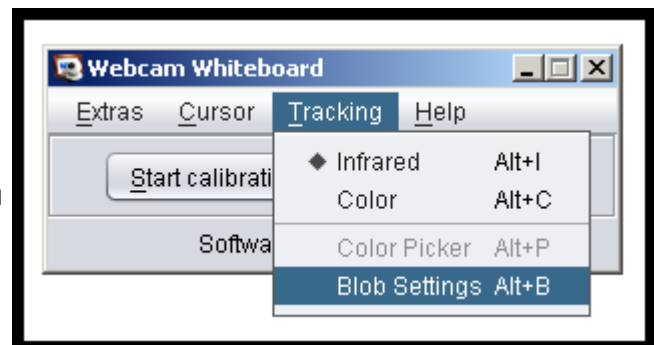


Before you continue it is recommendable to check the webcam's preview. It should show just a black image. Open the „Camera“ window under „Extras“.



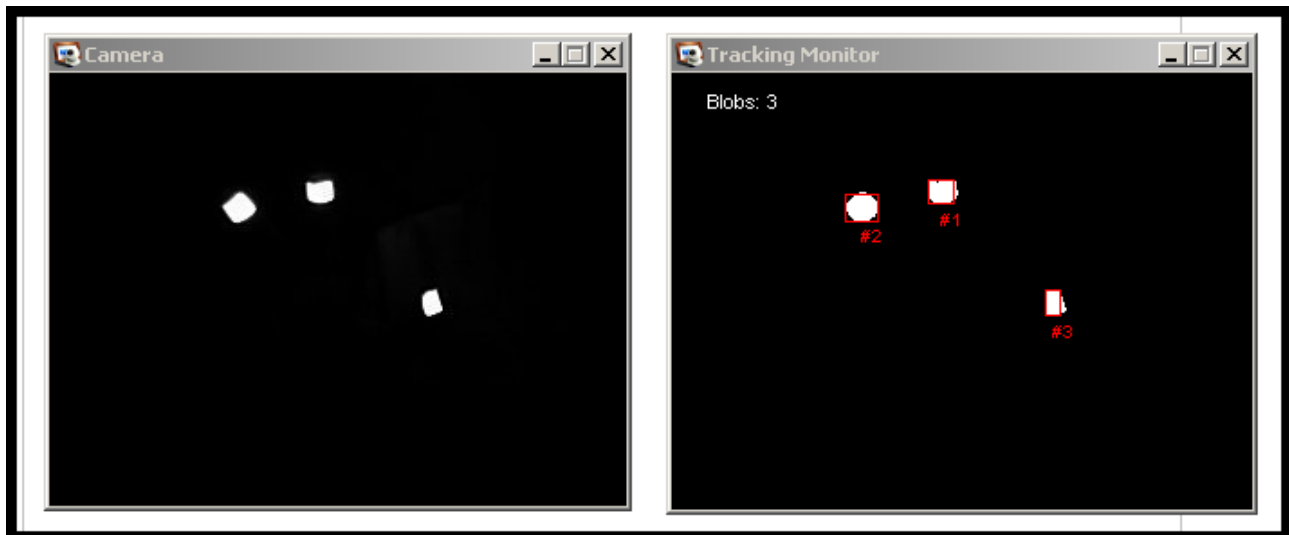
With this window you can also check if your reflective stripe works. It is also helpful to open the „Tracking Monitor“ to check if WW track the reflective stripe in the right way (also under „Extras“).

If there is a red rectangle around the shape of your reflective stripe, WW recognized it. If you just see the shape, but no red rectangle around it, the shape is probably too big or too small. You can change the size of your shapes, also called blobs under „Tracking“ → „Blob Settings“



There you can change the minimum and maximum size of the blobs. Additionally you can change the infra-red sensitivity under „Extras“ → „Settings“.

If you did everything correct the „Camera“ and „Tracking Monitor“ windows should look like this, while pointing with the reflective stripe at the webcam (the distance between your fingers and the webcam should not be too much, because at a certain point your fingers are too small):



## 6 How to control the cursor

The Finger Tracking Cursor Mode listens for particular input:



1 Blob: Move the cursor



2 Blobs: Wait for the user for new input



3 Blobs: Do a left click

The cursor moves relatively to your movement. That means, there are no fixed positions. It is not important, where you begin or end to move the cursor.

This mode was intended to pick the cursor and drag it around, then drop it. This means you pick the cursor by touching the index finger with your thumb (see first image), while the middle finger is hidden. This way WW knows, you want to move the cursor around. If you disconnect index finger and thumb, the action is finished and the cursor stops (see second image). Now you can tell WW to make a left click by showing additionally your middle finger (see third image).