

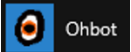
## Camera Instructions

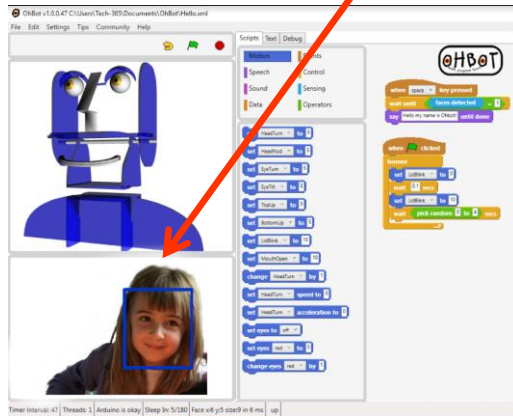
The camera allows you to program Ohbot to 'see' human faces, to sense movements and colours.

The camera can be mounted on the base so that Ohbot's view stays the same if Ohbot moves. Or it can be mounted on Ohbot's forehead so that as it turns and tilts the camera image changes.

The camera connects directly to your computer via a USB connection. The input from the camera is accessed within the Ohbot software via a set of special blocks found on the Sensing menu.

### Get started

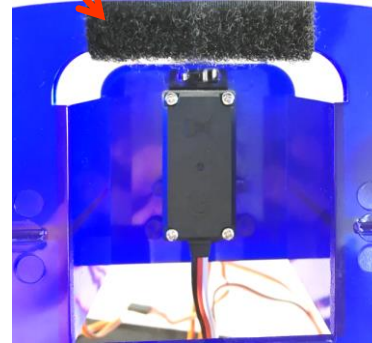
1. Shut down any other programs that might try to access the camera.
2. Plug the camera into a USB socket on the computer.
3. Start the Ohbot program 
4. Look out for the camera image here.



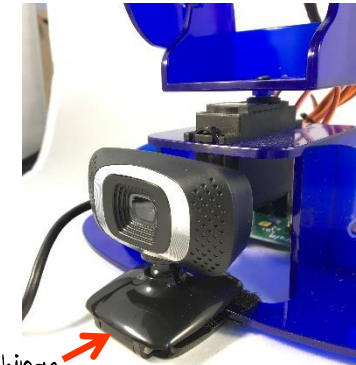
### To mount on the base

Stick the strip of Velcro loops onto the underside of the base

Velcro

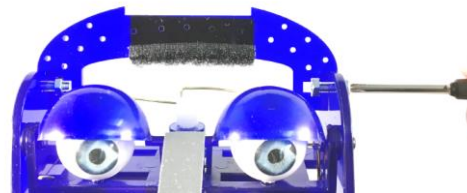


Turn the camera around on the base so that the hinge on the bracket is to the front. Open the hinge and secure to the base with the Velcro.



### To mount on top of head

Attach the headband using the nuts and bolts provided. Avoid overtightening the bolts.

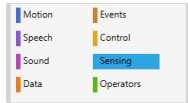


Fix in place with the hinge to the back

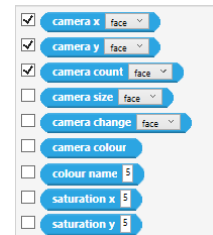


## Sensing the camera in the Ohbot Software

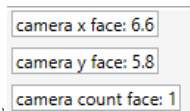
In the Ohbot software select the Sensing blocks menu.



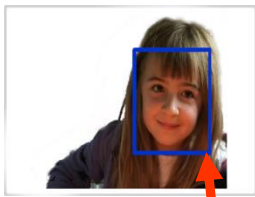
These sensor blocks allow you to work with inputs from the camera in your programs.



Put a tick in the box next to the blocks for Camera X Face, Camera Y Face and Camera Count to display the values of the blocks on the programming area of the screen:



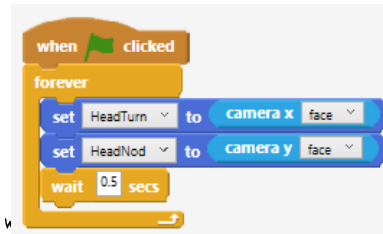
When a face is detected a blue box will appear overlaid on the camera image and the camera count face value will go to 1. The location of the face in the frame is given as an X, Y co-ordinate with the origin to the bottom left of the camera view.



Location of face detected

## Programming with the camera still

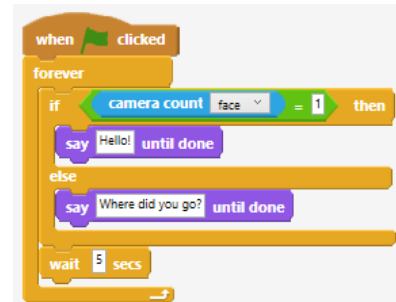
With the camera on the base the view that's "seen" will not change when Ohbot's head moves so a tracking program needs to be **absolute** and will need to move the head to the position that the face is detected in:



Try tinkering with the wait block to make Ohbot look at you more quickly or slowly?

## Programming with the camera still

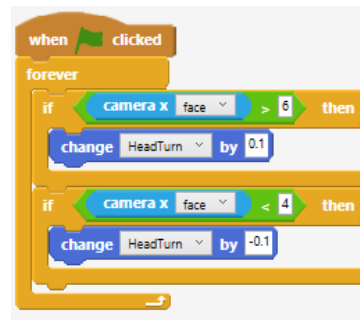
Try an If Else loop that will check whether there is a face in the camera view and say hello whenever there is.



Try tinkering with the code to make Ohbot react more quickly when it sees a face.

## Programming with the camera moving

With the camera on the headband the view that's "seen" will change every time Ohbot's head moves so a tracking program needs to be **relative** and will need to move the head left if the face that's detected is to the left of centre and to the right if the face is right of centre:



## Going beyond

Ohbot will also detect movement, colour and face size. For more information about these click on Help in the Ohbot software.

For more inspiration for programming with the Ohbot camera visit [www.ohbot.co.uk](http://www.ohbot.co.uk).

## About

Ohbot Ltd. Halliday's Mill, London Road, Chalford, Gloucestershire.  
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