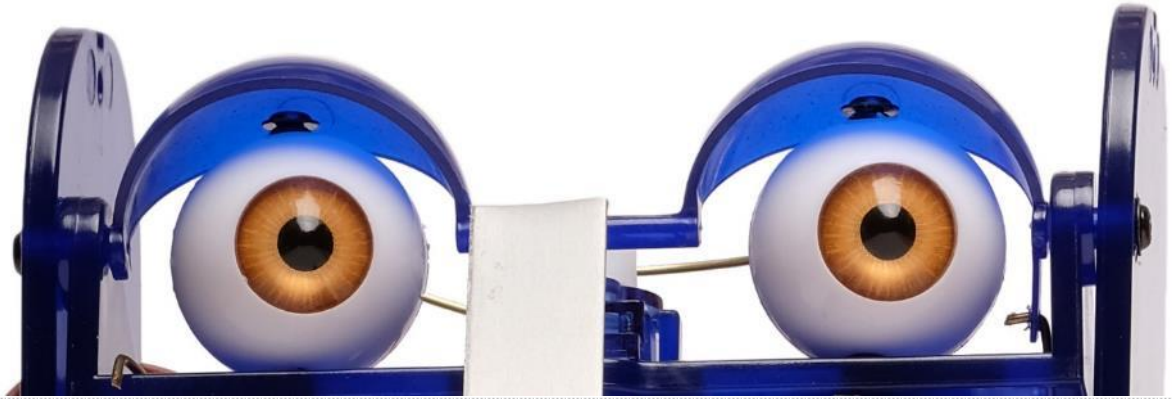
Robowatch

Using Ohbot Sensor Pack



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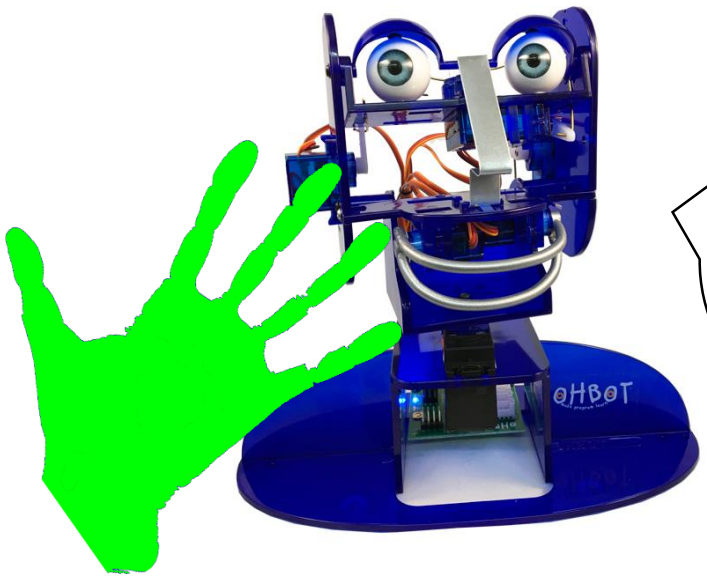
In this project you'll learn how to program an Ohbot to detect intruders.



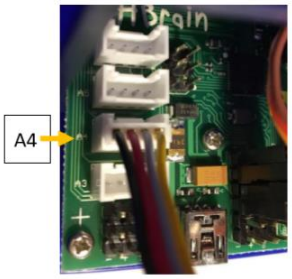
Help! Help!
Someone is trying to remove me from the table

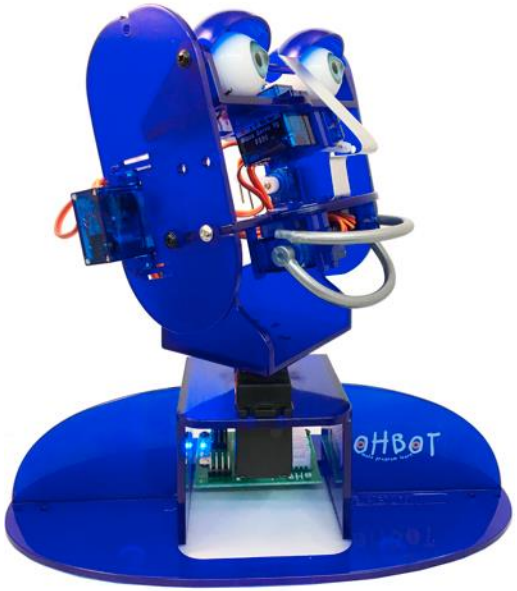
We've split the project into steps:

Step 1: Detect when Ohbot is lifted
Step 2: Detect when Ohbot is touched
Step 3: Detect sound
Step 4: Detect movement and faces
Step 5: Go beyond

Step 1: Detect when Ohbot is lifted

Connect the tilt sensor to socket A4 on Ohbot's circuit board



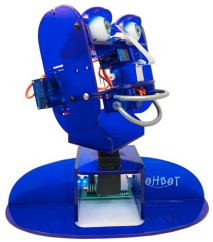


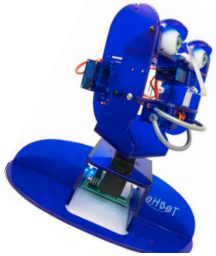
Attach the tilt sensor to Ohbot's shoulder like this:

Find the **Tilt** sensor in the **Sensing** blocks:

Put a tick in the box to see the sensor's value in the programming area.

Try tilting Ohbot and see the value change. 0 is false, 10 is true.





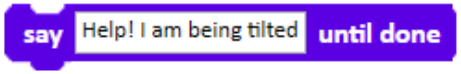
Step 1: Detect when Ohbot is lifted

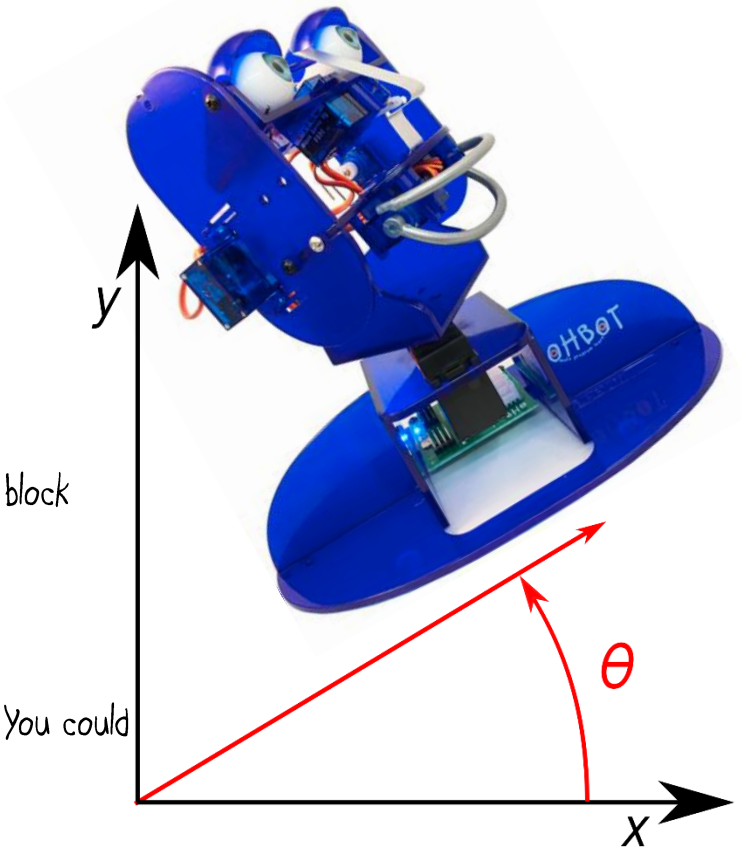
You can test tilt with an **If Then** block from the **Control** blocks

Drag the sensor block into the space like this:

Remember that you also need to start the sequence with an **Event** block

and that you need to make something happen when Ohbot it tilted. You could use a **Sound** block or a **Speech** block

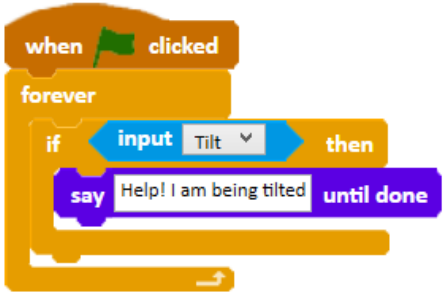


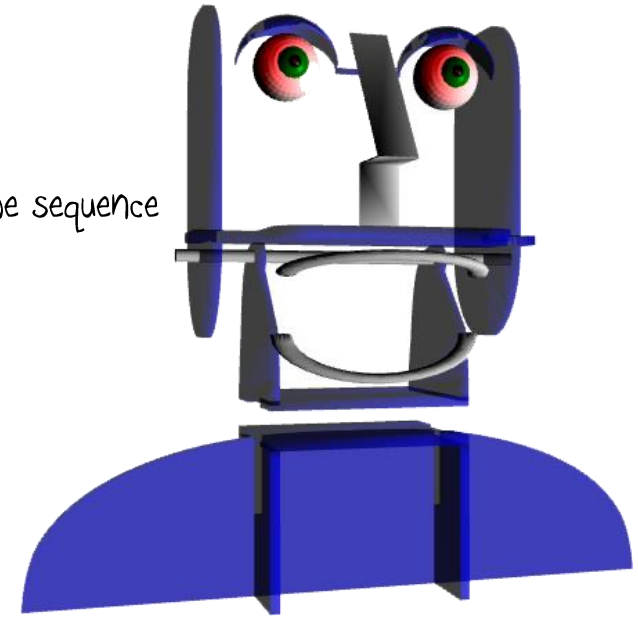


Step 1: Detect when Ohbot is lifted

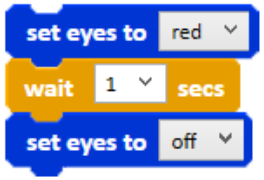
Putting this all together you have a sequence that makes something happen if Ohbot is tilted each time you run it by clicking on the green flag

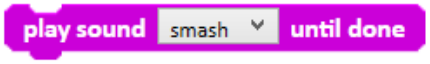
If you want to make this happen when you are not there you need to put the sequence into a **Forever** loop. Find this in the **Control** blocks

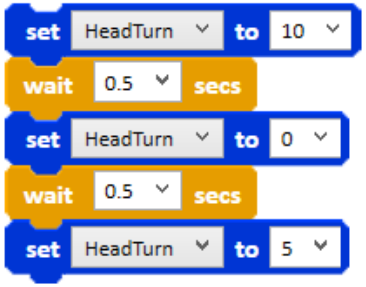




Now it's time to test and debug your code. Can you think of some other actions that Ohbot can take when it's tilted?
Here are some ideas:

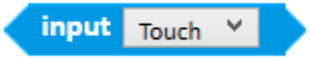






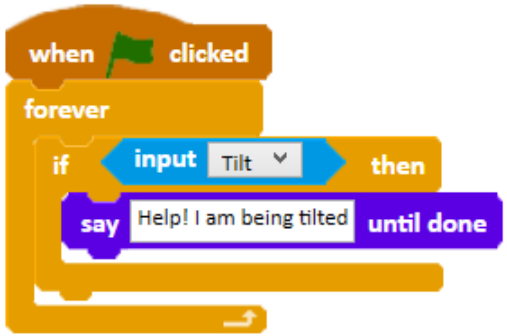
Step 2: Detect when Ohbot is touched

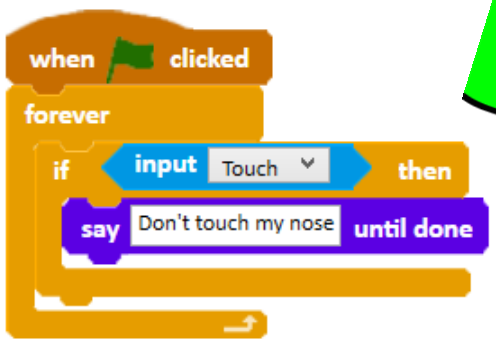
Connect the tilt sensor to socket A3 on Ohbot's circuit board. You'll find the **Touch** sensor in the **Sensing** blocks.

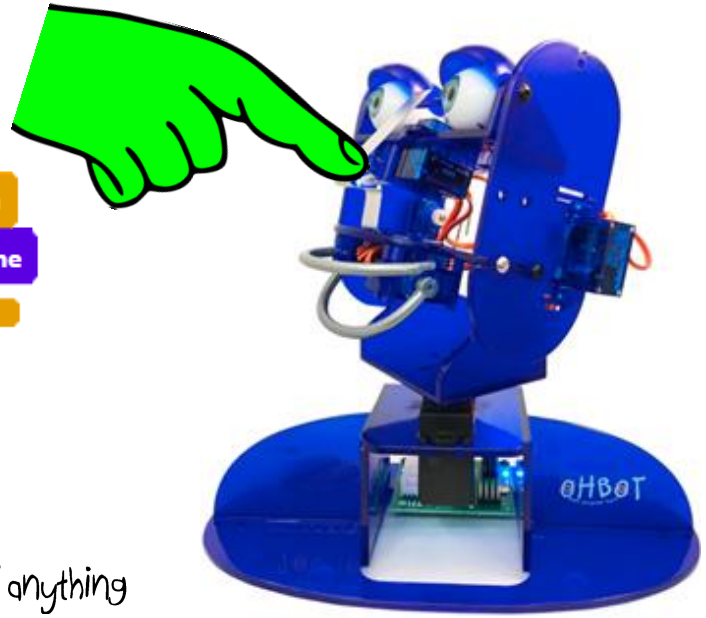


This block can be included in your program in the same was as the tilt sensor in step 1.

You can use a second loop that runs at the same time as the tilt sensor code







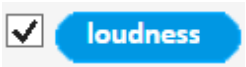
You can run up to 12 loops at the same time in this way.

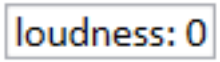
The touch sensor is usually connected to Ohbots nose. Can you think of anything else that Ohbot's touch sensor could be connected to?

Step 3: Detect sound

You'll find the **Loudness** sensor in the **Sensing** blocks.

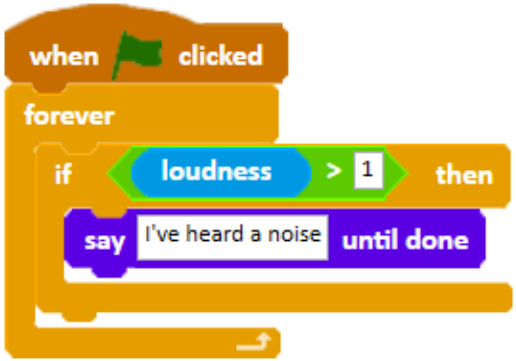
If you have a microphone connected to your computer this sensor will give you a number between 0 and 10 depending on the loudness of the sound sensed. Click the tick next to the block in the **Sensing** blocks to test what the value is when you make a noise. The value is displayed in the programming area.





There will always be some background noise and you don't want Ohbot to react when an aeroplane passes or a clock ticks so you need to use an **Operator** block to test when this sensor value is greater than the number that you have worked out in your test. Drag the **Greater Than** operator from **Operator** blocks and drag the **Loudness** block into it then set the value from your test.

You'll end up with something like this.

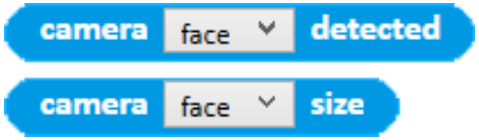


How else could Ohbot react when a noise is heard?

Step 4: Detect movement and faces

If your Ohbot has a camera fitted you can detect faces and movement that appear in the camera's field of view.

You'll find two blocks in the **Sensing** blocks.

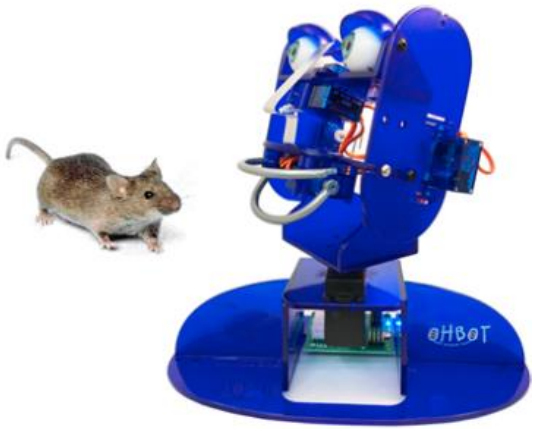


Drag these into your program and change **face** to **movement**. The first block gives a number between 0 and 10 for the number of areas of movement in the camera's field of view. The second block gives a number for the size of the largest movement. You can display these values, test them and use them in a sequence in the same way that you did for loudness in step 3.

Try changing from **movement** back to **face**. Is it more effective for your Ohbot to detect a face or movement?

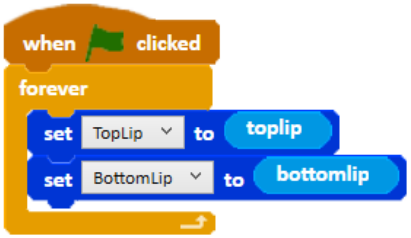
You will notice that the camera blocks are quite inaccurate and often identify faces and movement when nobody is there. You can try to prevent this happening by using different numbers in your tests.

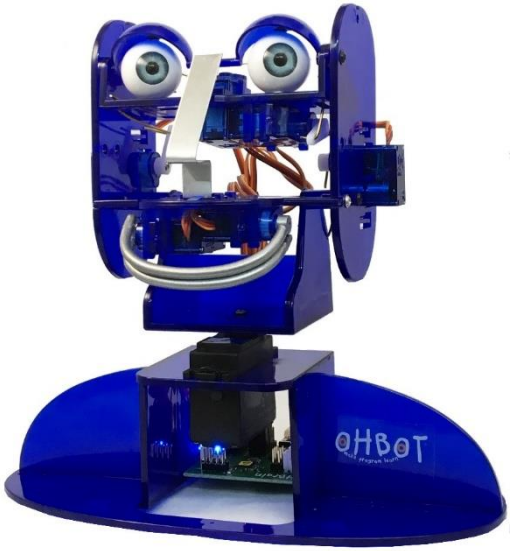
You can also experiment with the camera colour block. Could you make a program where Ohbot doesn't react when it "sees" you wearing a blue shirt but will set off an alarm when anyone else approaches?



Step 5: Go beyond

You can move Ohbot's lips in time with any speech by using this sequence





See if you can think of a way of outwitting your Ohbot program or your friend's program.

Can you think of any other sequences that should run when Ohbot is waiting to detect an intruder?

Can you think of any other sensors that would help Ohbot to detect an intruder?

Can you think of any other action that Ohbot should take when it detects an intruder?