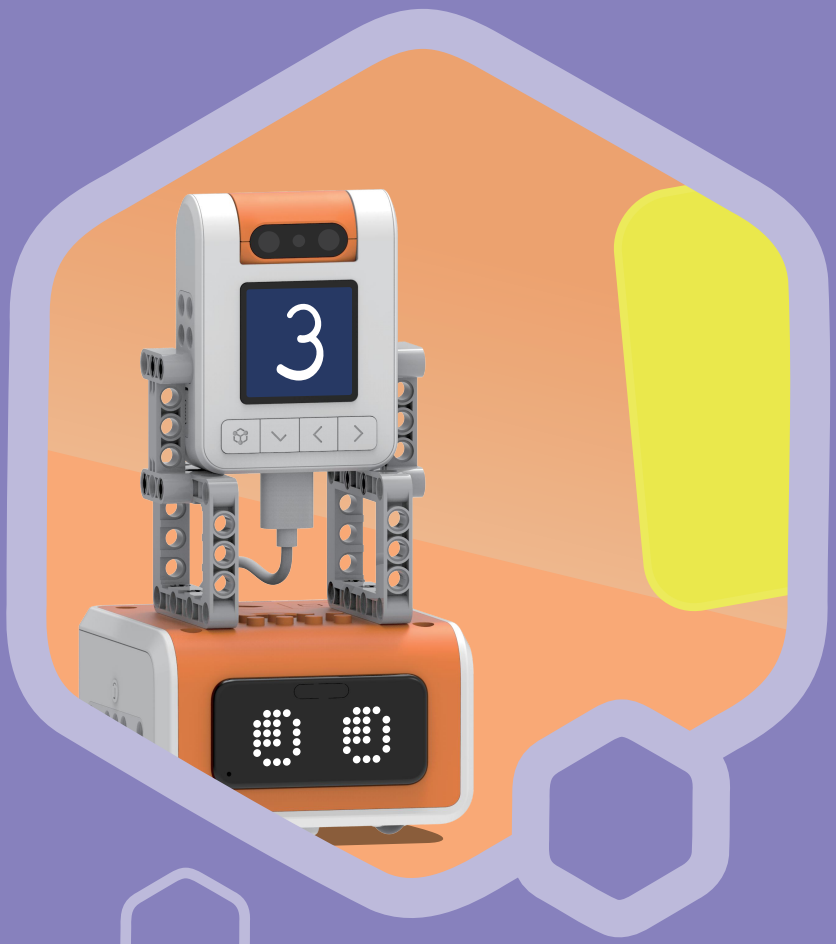
matata studio

8+
STEAM

AI Vision, Coding and Robotics

for VinciBot & AI Vision Kit



Contents

Construction Steps

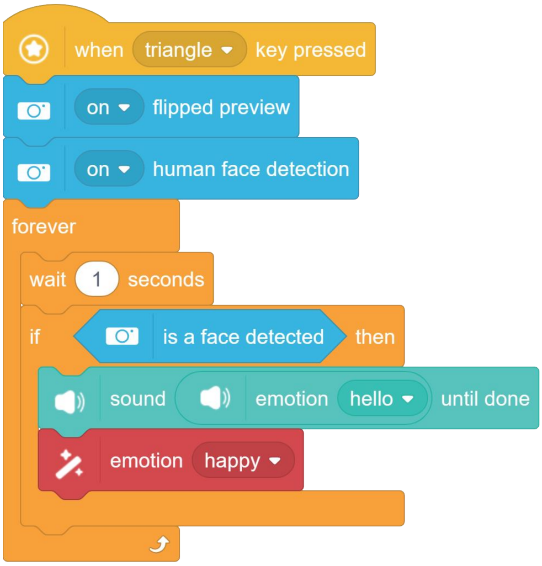
1 Good Friend VinciBot

Get familiar with human face recognition in the AI Vision module. Program VinciBot to say hello and laugh when detecting a face.

1 Follow the steps to mount the AI Vision module vertically on VinciBot so the screen faces forward. Connect the kit to VinciBot with one end of the cable to the module and the other end to the extension interface of VinciBot.

2 Turn on VinciBot and the screen lights up. Rotate the orange camera to check the preview image on the screen. For example, when the camera faces forward, the preview image is flipped.

3 Write the program to flip the preview image and enable face detection. When a face is detected, VinciBot says hello and laughs.



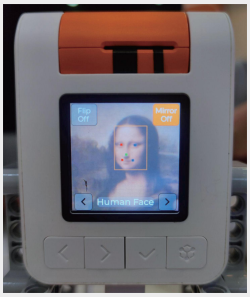
2 HALL OF FAME

Learn and master human face ID recognition in the AI Vision module. Use "One-Click Learning" for VinciBot to learn and enroll two face IDs. Program VinciBot to make a “hum” sound when detecting Face ID 1, and show “surprised” emotion when detecting Face ID 2.

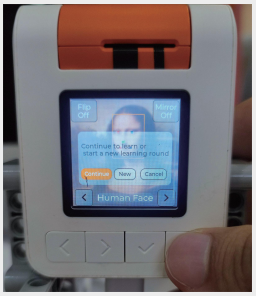
1 Turn on VinciBot and the screen lights up. Rotate the orange camera to check the preview image on the screen. When the camera faces backward, the preview image is upright (as shown below).

2 Prepare two face images. Follow the steps below to learn ID 1 and ID 2 with one click.

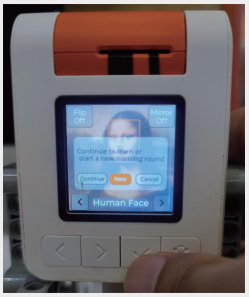
Put Face 1 in front of the camera. A yellow box appears around the face in the preview image on the screen.



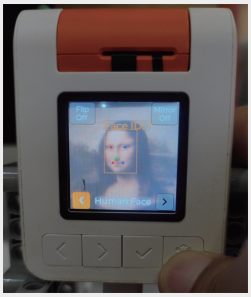
Press the "learn" button at the bottom right of the kit.



Use the left and right directional buttons to move the orange cursor. Move the cursor to "New" and press the "✓" button to confirm.



When the screen displays "Face ID:1", it means VinciBot has successfully learned this face and marked it as ID1.

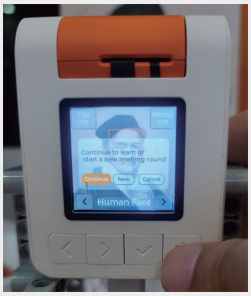


Key Points

Continue: Keep previously recorded face IDs (or color IDs) and continue to learn new face IDs (or color IDs).
New: Clear previously recorded face IDs (or color IDs) and start a new learning cycle.
Cancel: Exit the one-click learning mode.

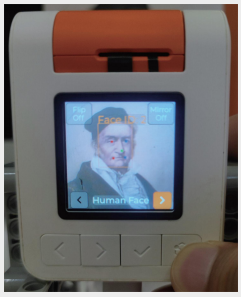
Place Face 2 in front of the camera.

Press the "Learn" button.



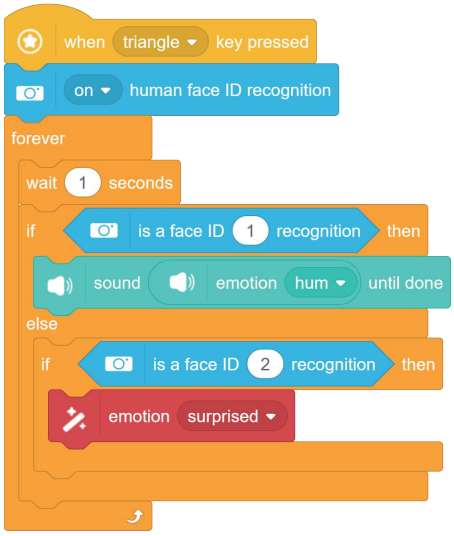
Use the left and right directional buttons to move the orange cursor. Move the cursor to "Continue" and press the "✓" button to confirm.

When the screen displays "Face ID:2," it means VinciBot has successfully learned this face and marked it as ID2.



NOTE VinciBot has learned these two face IDs. If VinciBot is turned off, these face IDs will be deleted. This means that each time the device is restarted, it needs to relearn face IDs starting from Face ID 1.

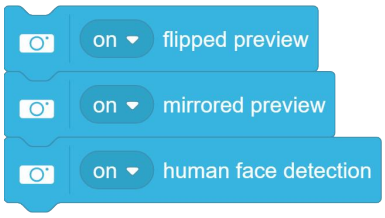
3 Then, program VinciBot to make a “hum” sound when detecting Face ID 1, and show “surprised” emotion when detecting Face ID 2.



3 FACE-TRACKING VINCIBOT I

TASK Understand the meaning of the "X", "Y", "width", and "height" parameters in the face center coordinate coding block, and learn the relationship between these parameters and changes in the face position.

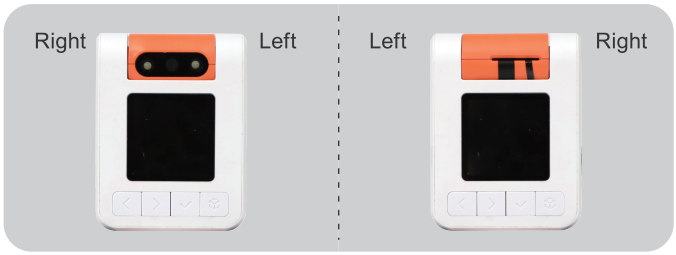
1 Turn on VinciBot and adjust the orange camera to face forward (as shown below). Now, the preview image on the screen is flipped. Use the programming blocks to turn on camera flip and camera image mirror until the preview image is upright. The face image in the preview moves as the face moves left and right. Then, turn on face recognition or face ID recognition.

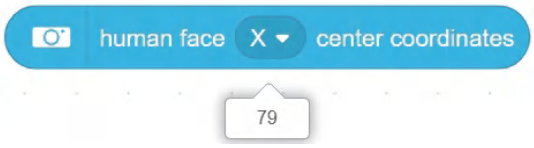


2 The human face center coordinate coding block can be used to lock the position of the face relative to the AI Vision. It has four parameters: "X, Y" refers to the coordinates of the center point of the face, and "width, height" refers to the width and height of the frame for face detection.

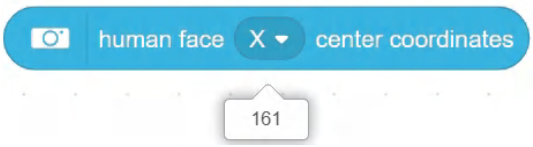
NOTE Face detection and face ID detection follow the same steps.

3 When the face is positioned centrally in front of the camera, the coordinates of the face center are X=120, Y=120. When the face moves to the right (towards the left from the perspective of the camera), the value of X gradually decreases to as low as 0. When the face moves to the left (towards the right from the perspective of the camera), the value of X gradually increases up to 240.





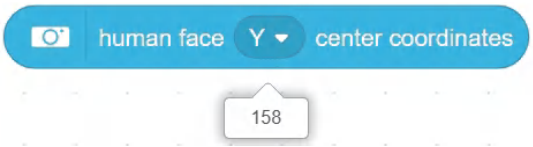
Face tilted to the right (towards the left from the perspective of the camera)



Face tilted to the left (towards the right from the perspective of the camera)

4 When the face moves upward, the value of Y gradually decreases to as low as 0. When the face moves downward, the value of Y gradually increases up to 240.

The face is tilted upwards



The face is tilted downwards

5 "Width, height" represents the width and height of the frame for face detection. when the face is closer to the AI Vision, the width and height values of the frame will be larger; otherwise, the values will be smaller.

Note: When no human face is detected, the values of "X", "Y", "width" and "height" are all 0. This factor needs to be considered when writing the program.